ABSTRACTS VOLUME

24th Annual Conference

International Association for Impact Assessment

24-30 April 2004 Vancouver, Canada

Whose business is it?

Impact Assessment for Industrial Development

IAIA'04 Canada

Hosted by the Canadian Affiliates of IAIA

IAIA-Western and Northern Canada Affiliate
Ontario Association for Impact Assessment
Association québécoise pour l'évaluation d'impacts

With support from Government of Canada / Gouvernement du Canada / Canada

NOTES

This document contains the abstracts of papers and posters presented at IAIA'04, the 24th Annual Conference of the International Association for Impact Assessment.

Abstracts received by the International Headquarters and with the presenting author registered by 29 February are included. Abstracts are included in the approximate order in which they were received, and/or authors' registrations were received, and/or changes or corrections were received. Key word and author indices are included at the end of this volume.

Abstracts may be minimally edited for consistency of style, punctuation and grammer. Length in excess of 300 words was subject to deletion. Text, contact information, and key words are otherwise reproduced as provided by the author(s).

APPLYING STRATEGIC ENVIRONMENTAL ASSESSMENT TO LAND USE AND RESOURCE MANAGEMENT PLANS IN SCOTLAND AND NEW ZEALAND: A COMPARISON OF APPROACHES

Jackson, Tony
The Geddes Institute for Planning Research
School of Town and Regional Planning
University of Dundee, Dundee DD1 4HT
Scotland, UK
+44 1382 345239 Fax: +441382 204234
a.a.jackson@dundee.ac.uk

Dixon, Jenny
Department of Planning
University of Auckland
Private Bag 92019, Auckland, New Zealand
+64 9 373 7599 ext.5344 Fax: +64 9 373 7652
j.dixon@auckland.ac.nz.

The paper examines current and proposed strategic environmental assessment systems within two planning regimes with very similar origins: one operating in a unitary state (New Zealand) that undertook radical changes in resource management at the start of the 1990s; the other (Scotland) striving to accommodate new European, British and Scottish priorities for resource management following legislative devolution and direct adoption of the statutory obligations of European Union (EU) Directives. Various models for transposing strategic environmental assessment (SEA) into planning frameworks are posited, using the Glasson-Gosling taxonomy. The New Zealand Resource Management Act (RMA) can be viewed as incremental; the Scottish application of sustainability appraisal (SA) regarded as concurrent; whereas the application of SEA to Scottish EU Structural Funds regional programmes is clearly stapled. The paper draws on practical experience of operating SEA procedures under each regime to demonstrate the strengths and weaknesses of these alternative approaches, viewed from the perspectives of the planner, the public and the developer. It then evaluates the implications of recent changes to New Zealand's RMA, and modifications to SA in Scotland, the latter to implement the EU SEA Directive. The extent to which statutory emphasis on assessment of environmental effects may weaken efforts to deliver holistic SEA that embraces socio-economic factors is considered. The arguments for and against applying a parallel SEA evaluation process to strategic land use and resource management plans are examined, in the light of alternative arguments for the principles of sustainable development to be fully embodied in the planning processes used for creating spatial development frameworks. The case is made for better integration of SEA into the planning process, to facilitate effective operational of spatial planning principles and to enhance transparency for business and the public.

Key words: *strategic environmental assessment, sustainable development, land use planning, resource management, Scotland, New Zealand*

IMPACT ASSESSMENT FROM A FIRST NATIONS PERSPECTIVE: REVIEW OF A PROPOSED LNG FACILITY

Wilkins, Susan
Pottinger Gaherty Environmental Consultants Ltd.
#1200 - 1185 West Georgia St.
Vancouver, BC V6E 4E6 Canada
+1 604 895 7621 Fax: +1 604 3497
swilkins@pggroup.com

Shum, Michael
Pottinger Gaherty Environmental Consultants Ltd.
#1200 - 1185 West Georgia St.
Vancouver, BC V6E 4E6 Canada
+ 1 604 895 7625 Fax: +1 604 682 3497
mshum@pggroup.com

Lewis, Randall
Squamish Nation, Squamish, BC

A Vancouver-based firm proposed to construct and operate a liquefied natural gas facility on the Sunshine Coast, BC. The project was large enough to trigger a federal-provincial environmental assessment, under the British Columbia Environmental Assessment Act (BCEAA) and the Canadian Environmental Assessment Act (CEAA). The project location is within the traditional territory of the Squamish Nation (SN), and the SN was represented on the joint Project Review Committee.

Pottinger Gaherty Environmental Consultants Ltd (PGL), a Vancouver-based environmental consulting firm, was retained by the SN to conduct an independent review of the proponent's impact assessment reports, on their behalf. The SN interests could have been represented with a submission prepared by consultants from their technical perspective. However, a technique was developed which briefed SN representatives, and allowed their First Nations viewpoint to be used in the actual assessment of impacts and mitigation measures.

PGL prepared a briefing package for the SN, which summarized the available baseline information by Valued Ecosystem Component (VEC) from the proponent reports. A simplified impact assessment methodology, based on the CEAA guide, was prepared. The proponent's assessment of significance of impacts was deliberately not included in the briefing package.

The results of the workshop were interesting and in some cases unexpected. Some VECs were found to have impacts not considered significant by the SN, while others were considered to be mitigable. There were a also a number of VECs where the impacts were judged to be significant, and the SN could not readily identify mitigation measures. PGL's final report to the regulators recommended that the latter group of VECs required further discussions between the proponent and SN.

The lesson from this case study is that a melding of technical expertise in impact assessment combined with First Nations traditional knowledge can produce powerful and meaningful results.

Key words: *impact assessment methodology; First Nations perspective, LNG facility*

COMPLIANCE WITH FISHERIES ACT SECTION 35(2) AUTHORISATIONS: A FIELD AUDIT OF HABITAT COMPENSATION PROJECTS IN CANADA

Quigley, Jason
Fisheries and Oceans Canada
Suite 200 - 401 Burrard Street
Vancouver, BC V6C 3S4 Canada
+1 604 666 7918 Fax: +1 604 666 0292
QuigleyJ@dfo-mpo.gc.ca

Harper, David
Fisheries and Oceans Canada
+1 604 666 3512 Fax: +1 604 666 0292
HarperD@dfo-mpo.gc.ca

Loss of fish habitat in North America has occurred at an unprecedented rate through the last century. In response, Fisheries and Oceans Canada (DFO) enacted the habitat provisions of the Fisheries Act. A "harmful alteration, disruption, or destruction to fish habitat" (HADD) cannot occur unless authorised with legally binding compensatory habitat to off-set the HADD. Canada's conservation goal is no net loss of the productive capacity of fish habitats (NNL). DFO's performance in achieving its conservation policies has never been evaluated on a national scale. We investigated 52 habitat compensation projects across Canada to determine biological, physical, and chemical compliance with authorisation specifications. Biological requirements had the lowest compliance (58%) and chemical requirements the highest (100%). Approximately 86% of authorisations had larger HADD and/or smaller compensation areas than authorised. These were not small differences. On average, HADDs in riverine habitat were 389% larger than authorised. Consequently, 45% of in-channel compensation projects and 72% of riparian projects resulted in net losses in habitat area. Potential Fisheries Act violations were prevalent at 50% of the projects. Multiple regression analyses indicated violations were negatively associated with the occurrence of a DFO field inspection, providing empirical support for increased monitoring. Habitat compensation, as currently implemented in Canada, is at best slowing the rate of habitat loss. Increasing the amount of authorised compensatory habitat in the absence of institutional changes will not reverse this trend. Improvements in monitoring and enforcement are necessary to move towards achieving Canada's conservation goals.

Key words: *compliance, habitat compensation, no net loss, field audit, Fisheries Act, policy*

STRATEGIC ASSESSMENT OF BIODIESEL GROWTH IN EUROPE

Johnson, Eric
Atlantic Consulting
Obstgartenstrasse 14, 8136 Gattikon, Switzerland
+41 1 772 1079
Atlantic@ecosite.co.uk

In 2001 the EC announced an "action plan" to increase biodiesel production and consumption dramatically, from less than 1 million tonnes in 2000 to something like 7 million tonnes in 2010. This report profiles the market development, the process costs for making biodiesel and the major associated impacts. These are four main areas: agricultural land use, emissions and energy consumption, rapeseed and glycerine markets and tax revenues. Our findings are that:

- Costs and tax revenues: Biodiesel costs significantly more to produce than petroleum diesel, so its market development will depend primarily on government subsidies. By 2010, EU governments could offer as much as 2.5 billion per year in tax breaks to biodiesel.
- Land use: The land required to grow rapeseed for biodiesel has already outstripped production from EU 'set-aside' land. To satisfy biodiesel demand in 2010, all current EU oilseed land (plus another 15% of acreage in addition) would need to be devoted to biodiesel markets.
- Environment and energy: Eight comparison studies conducted the US, Europe and Australia show that biodiesel is clearly lower than petroleum diesel in greenhouse gas emissions and non-renewable energy consumption. It is higher in NOx emissions. The verdict on particulate emissions is mixed - some say biodiesel is lower, some say petroleum diesel is lower.
- Market impacts: biodiesel will come to dominate global rapeseed markets, with market share climbing from 5% in 2000 to 40-60% by 2010. Glycerine markets will be swamped by byproduct output, which will more than double worldwide production potential.

Key words: *energy assessment, strategic environmental assessment, biodiesel, alternative fuels*

PROPOSITION OF AN ANALYSIS GRID FOR SEA PROCESSES

Risse, Nathalie
Service de Mathématiques de la Gestion
Université Libre de Bruxelles
CP 210/01 Boulevard du Triomphe
Brussels B-1050 Belgium
+ 32 2 650 5505 Fax: + 32 2 650 5970
nrisse@smg.ulb.ac.be

Crowley, Michel
Direction des évaluations environnementales
Ministère de l'Environnement du Québec
Édifice Marie-Guyart, 6ème étage
675 René-Lévesque Est
Québec (Québec) G1R 5V7 Canada
+1 418 521 3933#4682
Fax: +1 418 644 8222.
michel.crowley@menv.gouv.qc.ca

Waaub, Jean-Philippe
Département de géographie
Université du Québec à Montréal
C.P. 8888, succ. Centre-ville
Montreal, Quebec H3C 3P8 Canada
+1 514 987 3000, ext 8908
Fax: +1 514 987 6784
waaub.jp@uqam.ca

Vincke, Philippe
Service de Mathématiques de la Gestion
Université Libre de Bruxelles
CP 210/01 Boulevard du Triomphe
Brussels B-1050 Belgium
+ 32 2 650 5889 Fax: + 32 2 650 5970
pvincke@smg.ulb.ac.be

This presentation proposes an analysis grid for SEA processes that is applicable particularly to strategic planning and communicational planning. The grid aims at improving SEA as a decision aiding process. It serves to identify strong and weak points of existing SEA processes and to highlight elements to replicate, avoid or improve. It is composed of four groups of criteria that characterise the SEA process. The first group concerns the generic characteristics of SEA, i.e. that apply to the SEA process as a whole. The three other groups concern specific and operational aspects: the steps of the SEA process, the actors implied and the implementing tools.

Key words: *strategic environmental assessment, analysis grid, decision aid*

BRIDGING THE GAP: THE ROLE OF CUMULATIVE EFFECTS ASSESSMENT IN STRATEGIC ENVIRONMENTAL ASSESSMENT AND PLANNING

Dixon, Jennifer
Department of Planning
University of Auckland
Architecture Building
26 Symonds Street, Private Bag 92019
Auckland, New Zealand
+64 9 373 7599 Fax: +64 9 373 7562
j.dixon@auckland.ac.nz

Jackson, Tony
The Geddes Institute for Planning Research
School of Town and Regional Planning
University of Dundee
Matthew Building, Perth Road
Dundee DD1 4HT Scotland, UK
+44 1382 345239 Fax: +44 1382 204234
a.a.jackson@dundee.ac.uk

While concepts and methods for assessing cumulative effects are well developed at the project level, the relationship between cumulative effects assessment (CEA), planning and strategic environmental assessment (SEA) is more tenuous. Almost intuitively, practitioners recognise that it is at strategic levels (district, regional, national and transboundary) where decision-making has major implications for the creation of environmental effects that may be adversely cumulative in nature. However, cumulative effects assessment as a formal practice beyond the project level is problematic. Reasons for this include lack of understanding by practitioners, poor guidance from central government, jurisdictional difficulties, onerous data requirements, and inadequate funding. Nonetheless, requirements such as the SEA Directive for countries in the European Community and legislation such as the Resource Management Act in New Zealand demand that practitioners pay much more attention to addressing cumulative effects at strategic levels. The paper draws on an Auckland case study of housing intensification to identify and explore relationships between local land use plans (district plans) and housing developments in relation to the generation of cumulative environmental effects. Further, the paper examines the extent to which, despite a regional growth strategy that has implicitly embraced principles of SEA in providing for urban intensification, lower-level district plans are, in fact, inhibiting the consideration of cumulative effects at the project level. In this regard, the paper explores the extent to which, ironically, an effects-based approach to planning can undermine the management of cumulative environmental effects where insufficient attention has been given to these issues in local policy making. It is argued in this paper that more careful integration of planning, SEA and CEA is required in the planning process.

Key words: *cumulative effects assessment, planning, strategic environmental assessment, New Zealand*

NEW ZEALAND'S RESOURCE MANAGEMENT ACT—LESSON FOR HONG KONG?

Cheung, Michael
Department of Law
University of Hong Kong
C, 3/F, Block 19, Wonderland Villas, Kwai
Chung, N.T., Hong Kong
+852 93231877 Fax: +852 27858922
h9823184@hkusua.hku.hk

The environmental management system in Hong Kong has many problems: executive departments are confused with lines of responsibilities; legislations are diffuse and sectoral; and policies are conflicting with each other in certain contexts. This paper, thereby, contends that in order to better protect the environment in Hong Kong, more integration and co-ordination within the system is desirable.

The paper is organized in four sections. Section one sets forth the background information. It provides an overview of the intellectual pedigree of integrated environmental management and definitions of terms.

Section two discusses the strengths and weaknesses of Hong Kong's environmental management system. It analyzes different aspects of integration that deserve attention, including "instrumental integration" (i.e., harmonization of law and procedures), "organizational integration" (i.e., changes in administrative and policy-making arrangements), and "external integration" (i.e., integration of environmental consideration into all decision-making levels). It also examines broader issue of public participation.

Section three draws upon the New Zealand experiences with its Resource Management Act as a model for Hong Kong. It explores the key components of integrated resource management in New Zealand and examines how the New Zealand Ministry for the Environment forged a consensus among diverse groups for the need to form an innovative and integrated environmental management system.

The last section builds on earlier discussion and offers specific recommendations for Hong Kong to eradicate its weaknesses. Recommendations include integration of institutions, policies and laws and establishment of stakeholder council.

Key words: *environmental management system, integrated resource management, Hong Kong's environmental policy, New Zealand's environmental policy, public participation*

EFFECTIVENESS OF FISH HABITAT COMPENSATION IN CANADA IN ACHIEVING NO NET LOSS

Quigley, Jason
Fisheries and Oceans Canada
Suite 200 - 401 Burrard Street
Vancouver, BC V6C 3S4 Canada
+1 604 666 7918 Fax: +1 604 666 0292
QuigleyJ@dfo-mpo.gc.ca

Harper, David
Fisheries and Oceans Canada
+1 604 666 3512 Fax: +1 604 666 0292
HarperD@dfo-mpo.gc.ca

Canada contains approximately one quarter of the world's wetlands that support a rich biodiversity of over 198 fish species. Approximately one seventh (20 million ha) of Canada's wetlands have been lost in the last century. In North American freshwaters, 73% of fish extinctions can be attributed to habitat alterations. To prevent further erosion of the resource base and ensure sustainable development, Fisheries and Oceans Canada (DFO) enacted the habitat provisions of the Fisheries Act. A "harmful alteration, disruption, or destruction to fish habitat" (HADD) cannot occur unless authorised with legally binding compensatory habitat to off-set the HADD. Despite Canada's progressive conservation policies, the effectiveness of compensation habitat in replicating ecosystem function has never been tested on a national scale. The effectiveness of habitat compensation projects in achieving no net loss of habitat productivity (NNL) was evaluated at 16 sites across Canada. Periphyton biomass, invertebrate density, fish biomass and riparian vegetation density were used as indicators of habitat productivity. Approximately 13% of projects achieved a net gain in habitat productivity. These projects were characterised by mean compensation ratios (area gain:area loss) of 5:1. Twenty-five percent of projects achieved NNL and 63% of projects resulted in net losses in habitat productivity. These projects were characterised by mean ratios of 1.1:1 and 0.7:1 respectively. We demonstrated that artificially increasing ratios to 2:1 was not sufficient to achieve NNL for all projects. Our ability to replicate ecosystem function is clearly limited. Improvements in both compensation science and institutional approaches are recommended to achieve Canada's conservation goals.

Key words: *habitat compensation, effectiveness, No Net Loss, field evaluation, policy, Fisheries Act*

INTELLIGENCE FROM ENVIRONMENTAL REGULATORY INFORMATION: WHAT'S REALLY AVAILABLE?

Johnson, Eric
Atlantic Consulting
Obstgartenstrasse 14, 8136 Gattikon Switzerland
+41 1 772 1079
Atlantic@ecosite.co.uk

Environmental permits, EIAs, EISs and the like have led directly or indirectly to a massive compilation of industrial information, some of it publicly available. In principle this has value in protecting the environment, and it also is of interest to industrial engineers and analysts.

But how much value is there in reality, and how publicly available is it? We decided to test these questions in late 2003 by trying to access information on chemical plants in England, Germany, Switzerland and the United States. We chose chemical plants, because we know the industry well, and we can compare the results found with private information that we know to be accurate.

Our experiences in the four countries were very, very different indeed. This paper will present our story, plus it will briefly review:

- What is competitive intelligence?
- Sources of public environmental information
- Conclusions for generators/users of intelligence and policy-makers

Key words: *public information, environmental policy, freedom of information*

ROUNDING UP THE USUAL SUSPECTS: IDENTIFYING COMMON DEFICIENCIES IN EIAS

Grassetti, Richard
Grassetti Environmental Consulting
California State University, Hayward
7008 Bristol Drive, Berkeley, CA 94705 USA
+1 510 849 2354
GECONS@aol.com

In 20-plus years reviewing US (NEPA) and California (CEQA) EIAs on behalf of consulting firms, public interest groups, and attorneys, the author has encountered a number of common deficiencies in EIA documents and processes that routinely provide grist for legal challenge. Searching for these common deficiencies in critical review of EIAs for project opponents is referred to as "rounding up the usual suspects." This paper describes the author's "top 34" such deficiencies, their usual causes, their implications for overall document adequacy, and how to keep them from tainting your EIA.

Key words: *EIA deficiencies, EIA adequacy, legal challenges, NEPA, CEQA*

TESTING AN SEA METHODOLOGY IN THE ENERGY SECTOR—THE CASE OF WASTE INCINERATION

Nilsson, Måns
Stockholm Environment Institute
Box 2142, Stockholm 10314 Sweden
+46 8 4121415 Fax: +46 8 7230348
mans.nilsson@sei.se

Finnveden, Göran
Environmental Strategies Research Group
Box 2142, Stockholm 10314 Sweden

Strategic Environmental Assessment (SEA) is a tool with the purpose of integrating the environmental aspects in a structured manner in strategic decision-making processes. SEA has suffered from a lack of substantive analytical methodologies and tools, which has limited its effectiveness in decision-making. In a previous paper we have developed a framework of methods for an SEA process in the energy sector. This case study concerns the testing of three analytical pathways on a policy proposal on taxation of waste incineration in Sweden. This will impact on the waste management system as well as energy system, and a set of environmental systems analytical tools are applied to better understand these impacts. Life Cycle Assessment, site dependent analysis, and qualitative analysis, as well as valuation methods, are applied and compared. Results are discussed in relation to the tax propsoal itself as well as reflecting on the methods and their usefulness. Results indicate that environmental improvements are expected with the introduction of the tax. It is suggested that different methods have different functions and are useful in different contexts and they therefore complement each other. Careful consideration must be given to methods selection at the start of the assessment.

Key words: *strategic environmental assessment, SEA, energy, waste, LCA, life cycle assessment, risk*

MULTIPLE METHODOLOGIES ACHIEVE BROAD SPECTRUM STAKEHOLDER INVOLVEMENT

Roberts, Richard
The Praxis Group

Traditional public consultation processes rely on only a few public involvement approaches—most frequently open houses, public meetings, information sessions and comment sheets. And in most processes, only one or another of these approaches are used. These approaches tend to target self-selected audiences and are frequently criticized for representing the views of limited sectors. As well, in today's society many stakeholders and the public in general do not have the time or the inclination to attend open houses or public meetings. Consequently, traditional approaches miss many sectors of society.

The Praxis Group having worked in this discipline for over 18 years has recognized and addressed this by developing methodologies that target a broad spectrum of stakeholders. These methodologies take advantage of current telecommunications and Internet technologies and include approaches such as web-based on-line surveys, telephone surveys, intercept surveys as well as the more traditional surveys that can be quickly analyzed through the use of scan-readable survey technology. When these approaches are combined with the more traditional consultation techniques identified earlier along with other methodologies such as information sessions, focus groups, sector-specific discussion sessions, and expert interviews, a much broader range of stakeholders can be engaged than through traditional approaches alone. Clients feel satisfied that consultation initiatives have targeted not just those with vested interests but also the broader population.

The paper explores three case studies where multiple approaches were used: the Ghost Waiparous Access Management Planning Process, the Alberta Public Safety and Sour Gas public process and the Kananaskis Country Recreation Development Policy Review.
The case studies confirm that these approaches help target and solicit input from a broad range of stakeholders. Public acceptance and use of technology-based methodologies has also been confirmed by a 95% response rate for some of our on-line surveys.

STRATEGIC ENVIRONMENTAL ASSESSMENT: NEEDS AND OPPORTUNITIES IN MEXICO

Palerm, Juan R.
Department of Project Engineering
University of Guadalajara
Apartado Postal 5-737, Zapopan, Jalisco

C.P. 45040 Mexico
+52 33 3656 0767 Fax: +52 33 3656 3639
jpalerm@dip.udg.mx; Juan_Palerm@yahoo.es

Albeit officially a "democracy" for nearly a century, Mexico's political system may at best de described as a "consolidating democracy." For over seven decades, Mexico was led by a single party whose idea of planning rarely involved long-term scenarios, public participation or any sort of environmental assessment. Things have not changed much since the gradual turn to a more consolidated democratic system, although EIA legislation has been passed and civil society has matured. As yet there are no intentions to assess plans and programmes on their potential environmental impacts. Planning schemes are increasingly becoming more controversial with regards to their potential environmental and social impacts and the limited opportunities for public involvement, leading to a loss of legitimation of planning authorities and resulting in delays to implement associated projects, not to mention the resulting environmental impacts of plans and programmes (and their associated projects) that respond to sectorial and political objectives with little regards to their environmental dimension. Planning practices are not keeping pace with the consolidating of the democracy in Mexico. This paper analyses the needs and opportunities to implement an SEA system in Mexico, based on a case study of the water management planning in the Lerma-Santiago-Chapala watershed, a comprehensive review of current planning and environmental assessment systems, and making reference to other relevant and controversial planning schemes such as the Puebla-Panama Plan.

Key words: *strategic environmental assessment, environmental planning, Mexico,Latin America*

LARGE SCALE AND LONG TERM IMPACTS – PRACTICAL LESSONS FROM BIG PROJECTS

Skehan, Conor
EIS Ltd.
6 Merrion Square, Dublin 2
6612142 Fax: 6769502
eis@eis.ie

Working in Ireland and Iceland, Conor Skehan has been involved both in the preparation and assessment of Impact Assessments for very large projects. The experiences are drawn from the energy, electronic, biotechnology and transportation sectors.

Ireland's recent success is attracting many of the world's largest and most successful industrial enterprises. These have included Intel, Dell, Wyeth, Abbott, IBM and Eli Lilly. This created a need to provide Impact Assessment very quickly and very competitively. The work needed to be carried out within the context of the full panoply of EU environmental legislations as well as the county's demanding planning and water regulations. Above all, the IAs must be effective to satisfy the requirements of Ireland's vigilant and energetic N.G.O sector. Similar challenges also face more specifically local major projects—such as very large wind farms (300mw) or a Metro for Dublin. The paper will share practical solutions to reducing time and cost while maintaining the highest standards in IA preparation for project promoters.

Conversely while working for competent authorities on the assessment of very large energy IAs—off-shore windfarms in Ireland and hydroelectric schemes in the wilderness interior of Iceland—has produced lessons on the challenges of evaluation and decision making. In such projects there is the potential for significant and irreversible environmental impacts. The paper will share lessons learnt about criteria and methods for decision making at scales beyond the boundaries of conventional standards and designations. The pragmatic of politics, the practicalities of protection, the ethics of elimination together with the exercise of authority are all addressed.

TOWARDS SUSTAINABILITY IN THE ENGLISH REGIONS: IS INTEGRATED APPRAISAL A STEP IN THE RIGHT DIRECTION?

Kidd, Sue; Fischer, Thomas
University of Liverpool
74 Bedford Street South
Liverpool, Merseyside L69 7ZQ England-UK
+44 151 7943111 Fax: +44 151 7943125
SueKidd@liv.ac.uk
Fischer@liv.ac.uk
www.liverpool.ac.uk

The paper reflects on the experiences gained with the preparation process of an integrated appraisal toolkit for policy, plan, programme and project making in England's North West region. It is suggested that whilst there are potentially a range of benefits attached to looking at the environmental, social and economic impacts in parallel, there may also be some dangers and pitfalls. These relate to the methodological flexibility often applied in integrated assessment, tensions between the sustainability and governance agendas and the relationships of integrated and sustainability approaches to impact assessment.

Key words: *integrated appraisal, governance, flexibility*

IMPACT ASSESSMENT AND CORPORATE SOCIAL RESPONSIBILITY: A COMPARATIVE CASE STUDY REVIEW OF OIL AND GAS INDUSTRY IN CASANARE, COLOMBIA, AND NIGER DELTA, NIGERIA

Egbeleke, Adeyemi Ademola
Bradford Centre for International Development
5, Howard Street, Bradford, West Yorkshire BD 5 0BP UK
yemiegbeleke@yahoo.co.uk

"All types of activities performed by man have an impact on environment, of all man-made activities, industry mainly attract public interest with reference to environmental problems." - G. Drogaris, 1992

This paper will focus on industrial development and its impact on environment with both social and economic dimension. The role of impact assessment as a mitigating instrument to the problems and means of achieving sustainability is examined. However, industries over time have been approaching sustainable development issues from the corporate social responsibility perspective. A critical review of the corporate social responsibility concept and approach is considered to know the extent to which impact assessment instrument is emphasized. Further to that is a look at global compact which is a system to make business act as corporate responsible citizens, even though it has neither "policing or enforcing mechanism." It is therefore opined that this gap could be bridged by impact assessment. And to illustrate this thinking, a comparative review of cases is done in order to know how impact assessment can be use in making partnerships for managing social issues in extractive industry work.

The conclusion is that impact assessment principles should be integrated into corporate social responsibility's code of conduct and as a reporting mechanism tool. By these the aim of global compact to achieve sustainable global economy would be realized.

Key words: *industrial development, impact assessment, sustainable development, corporate social responsibility, global compact*

DEVELOPING A SITING APPLICATION FOR ELECTRIC TRANSMISSION FACILITIES: DATA, DISPLAY, DECISIONS, AND DOCUMENTATION

Deming, Mary Beard
Southern California Edison Company
2244 Walnut Grove Avenue
Rosemead, CA 91770 USA
+1 626 302 9528 Fax: +1 626 302 9730

Hawkins, David
Facet Decision Systems, Inc.
1060 West 8th Avenue, Suite 300
Vancouver, BC V6H 1C4 Canada
+1 604 606 8070 Fax: +1 604 739 7753
www.facet.com

For more than 100 years, Southern California Edison (SCE) has provided high-quality, reliable electric service to areas in coastal, central and southern California. Sustaining that record of reliable service requires the timely siting and licensing of new and upgraded facilities to meet anticipated electrical demand. This is no easy task in an increasingly complex world of competing land uses, environmental sensitivities, stakeholder diversity, and regulatory uncertainty.

SCE and Facet Decision Systems have developed a decision support computer application to address the complex scenario-planning requirements of transmission grid planning. The SITING application helps SCE to evaluate and plan the most favorable corridors and routes for linear facilities and locations for substations. Using web-based computer technology and a GIS platform, stakeholders can value such decision factors as habitat for native and endangered species, visual quality objectives, and land-use to create alternative scenarios. SITING provides "Triple-Bottom-Line" results—social, environmental and economic—to meet the needs of all stakeholders.

The application was designed to serve two purposes: efficient management of the information necessary for impact assessment, and effective facilitation of the SCE planning team and of external stakeholder involvement. Issues associated with developing the application will be discussed: data management, display and sharing of information among stakeholders, the decision framework, and documentation of results in an accessible format. Case study results will illustrate the capabilities of the application.

Key words: *electric transmission, siting and licensing, decision support, scenario planning, GIS, stakeholder involvement, Triple-Bottom-Line, impact assessment, case studies*

SQUARING THE CIRCLE: ASSESSING THE POTENTIAL OF BIOMASS IN RURAL SCOTLAND

Illsley, Barbara; Lynch, Bill; McAdam, Suzanne
The Geddes Institute for Planning Research
School of Town and Regional Planning
University of Dundee, DD1 4HN Scotland, UK
+44 1382 345243 Fax: +44 1382 294234
b.m.illsley@dundee.ac.uk
w.lynch@dundee.ac.uk
s.mcadam@dundee.ac.uk

In response to the Kyoto summit held in 1998, the UK Government has set demanding targets for the reduction of emissions from greenhouse gases. Its long-term goal is to achieve a 60% cut of CO2 by 2050. To meet this goal, the Government is seeking to promote renewable energy with a national target that by 2010 10% of energy needs will be met from renewable sources. While in the past, most attention has focused on developing wind, wave and hydro technologies, there is now a growing interest in the use of biomass as a source of renewable energy in Scotland.

The use of biofuels, including wood, is well established in some parts of the world such as Scandinavia and North America. In Sweden, for example, wood is used extensively in district heating schemes and it provides almost 16% of the country's energy demand. Scotland is well placed to develop a similar wood fuel industry. Over the next two decades the supply of conifer timber produced in Scotland will almost double from 6 to 10 million tonnes a year and a recent study by Bidwells estimated that over a third of this could be available for the wood fuel market. However, at present, supplier networks of wood fuel, as woodchips of wood pellets, are poorly developed in Scotland and there is a lack of public awareness of the benefits of wood fuel to consumers. It is clear that both supply and demand issues will

need to be addressed if the benefits of wood fuel to rural communities are to be realised.

During 2003, SCARF (Save Cash and Reduce Fuel) obtained funding from the Energy Savings Trust to commission a study into the potential for locally sourced wood fuel to provide a means of increasing fuel choice and addressing fuel poverty in Perth and Kinross Council area. The study aims to demonstrate demand-side potential and issues through an attitude survey of residents on off-mains gas communities in the area and to identify supply infrastructure and consider the level of interest in developing the local market and possible barriers.

This paper examines the findings from the Perth and Kinross Wood Fuel Project and assesses the potential for developing a wood fuel market in Perth and Kinross, linking supply and demand, and thus squaring the circle.

Key words: *sustainable forest management, renewable energy, biomass, Scotland*

THE PRINCIPLES OF EIA FOLLOW-UP

Marshall, Ross
NEAS
Environment Agency
Waterside House House, Lincoln, UK
ross.marshall@environment-agency.gov.uk

Arts, Jos
Ministry of Transport, Public Works & Water Management
Transportation/EIA Centre
PO Box 5044, 2600 GA Delft, The Netherlands
+31 15 2518461 Fax: +31 15 2518555
e.j.m.m.arts@dww.rws.minvenw.nl

Morrison-Saunders, Angus
Murdoch University
South St., Murdoch 6150 Australia
+61 8 9360 6125 Fax: +61 8 9360 6787
angus@essun1.murdoch.edu.au

EIA Follow-Up is emerging as an increasingly important and critical component of good EIA practice and an essential bridge between the pre-consent and post-decision phases of development.

As one of the few truly international organisations addressing EIA, IAIA has an important role in strengthening EIA capacity building and establishing best practice within specific areas of EIA activity. During the last 5 years, annual sessions on EIA Follow-Up have been organised and held during the annual IAIA conferences. These sessions have attracted a wide range of practitioners who have presented practical work and discussed the interest in this area. It was suggested by participants at IAIA'03 in Marrakesh, Morocco, that at IAIA'04 the concepts and experience developed to date should be communicated a wider set of principles for EIA Follow-Up.

The Principles of EIA Follow-Up are designed primarily for reference and use by those professionally involved in environmental impact assessment and post-decision project environmental management. The aim is to promote familiarity and the practice of EIA Follow-Up within the institutional and corporate procedures for EIA practiced internationally. To accommodate flexibility and local interpretation, the principles will be presented as broad, generic and non-prescriptive concepts. This is to emphasis that EIA Follow-Up can take many forms and can be applied at all levels of EIA and across different types of development.

Key words: *EIA, EIA follow-up, principles*

EXCHANGING ALPHABET SOUP FOR A MAP AND COMPASS—PATHWAYS TO POLICIES AND PROGRAMMES FOR SUSTAINABLE DEVELOPMENT

Ward, Martin
31 Moncks Spur Road Redcliffs
Christchurch, South Island, New Zealand
+64 3 384 9590 Fax: +64 3 384 9590
enva@ihug.co.nz

Dalziel, Alison
Department of Prime Minister & Cabinet
Parliament Buildings
Wellington, North Island, New Zealand
+64 4 471 999
alison.dalziel@parliament.govt.nz

Strategic Environmental Assessment (SEA), Integrated Environmental Assessment (IEA), Sustainability Appraisal (SA), Environmental Sustainability Assessment (ESA), and Sustainable Impact Assessment (SIA) are the methodologies or approaches to impact assessment that are most commonly cited as useful or necessary in the development of policies and programmes to deliver sustainable development. All have a role to play, but without institutional frameworks to make policies and programmes available to their application at an early stage, and without a political framework to accept their results, they will have little impact. With strong political support for sustainable development in New Zealand but little political or bureaucratic interest in additional and/or unintegrated steps in government decision making process, New Zealand officials are developing an approach which aims at improving the existing policy development process itself. This paper discusses some current work that examines the existing governance and policy making arrangements and seeks to identify changes to these arrangements that will improve decision making towards more sustainable outcomes.

Key words: *sustainable development, sustainability appraisal, New Zealand*

RIGOR OF EIA REVIEW AND ITS IMPLICATIONS ON PREDICTING AND MONITORING IMPACTS IN TURKEY

Shih, Sherwin; Komers, Petr
MSES
207 Edgebrook Close NW
Calgary, AB T3A 4W5 Canada
+1 403 241 8668 Fax: +1 403 241 8679
sherwin.shih@mses.ca
pkomers@mses.ca
www.mses.ca

Environmental Impact Assessment (EIA) review is an essential phase of the EIA process that determines whether EIAs comply with the appropriate terms of reference, provides an opportunity for public comment, and examines the validity of predictions. In Turkey, EIA regulations include detailed provisions for the review process. The legislation specifies the duration, the requirements of the review process and the criteria to be applied by members of the review commission. However, despite government efforts to streamline the quality of EIA reports, major shortcomings are still inherent within the EIA review process that undermine the ability to predict and monitor environmental impacts and to foster sound environmental management. A meta-analysis was conducted to investigate the Turkish EIA review process, to analyze the effect of EIA quality on monitoring and environmental management, and to compare aspects of the Turkish and the Canadian review process. The research reveals that in practice, low financial resources, poor training and expertise, weak enforcement of regulations, corruption, unavailable data, lack of objectivity, and an imposing political context (that is, the degree to which the Turkish authorities are willing or able to make environmentally sound development a genuine priority) have influenced the rigor by which Turkish EIA reports are reviewed. EIA reports are generally not reviewed in technical detail, particularly with regard to impact prediction and monitoring. Monitoring takes place mostly in response to problems or complaints after a project has been approved. The Canadian EIA system, in contrast, allows for more stringent and independent review of EIA reports and encourages the development and implementation of monitoring measures. Having consulted industry and NGOs in Turkey, the authors believe that rigorous review and effective environmental management will require changes to the existing institutional EIA framework and a greater provision of resources including training, review guidelines, and collaborations.

Key words: *environmental impact assessment, review, Turkey, monitoring, Canada, EIA systems*

ACHIEVING SUSTAINABILITY THROUGH AUSTRALIA'S NEW IMPACT ASSESSMENT REGIME

Early, Gerard
Approvals and Wildlife Division
Australian Government Department of the Environment and Heritage
GPO Box 787, Canberra ACT 2601 Australia
+61 2 6274 1077 Fax: +61 2 6274 1600
gerard.early@deh.gov.au

In 2000 the Australian Government introduced new environmental legislation, the Environment Protection and Biodiversity Conservation Act 1999, as a radical overhaul of Australia's national environmental impact assessment regime. The new legislation was designed not only to provide better protection for the environment but also specifically to assist industry by improving the efficiency and timeliness of environmental and development approval processes. The Act promotes decision-making on the basis of ecologically sustainable development, including consideration of environmental, economic and social factors. It also rationalises government responsibility for impact assessment and establishes a fully transparent process with specific statutory timeframes and upfront certainty. The paper will describe the streamlined regulatory processes of the new Australian impact assessment regime and experience over its first four years in relation to industrial and resource developments. This experience includes a major strategic assessment of Australian offshore oil and gas exploration and a series of strategic assessments of Australian fisheries.

Key words: *impact assessment, strategic environmental assessment, sustainability, industry*

THE BOUNDARIES OF PEACE AND THE CHALLENGES OF IMPACT ASSESSMENT: THE IRAQI EXPERIENCE

Offu, Peter
Dept of International and Strategic Studies
University of Malaya
50603 Kuala Lumpur, Malaysia

The paper shall identify and analyze the central strategic issues of the Boundaries of Peace and the frontiers/challenges of Impact Assessment in Iraq based on 4 schematic approaches:

1. The Boundaries of Peace and Terror: Issues discussed in this section include the fundamental limitations and/or challenges of peace in the war against terror. What are the boundaries of terror for building adequate response capacity for resilient development? Why has it been very difficult for peace to reign in Iraq despite the dethronement of Saddam Hussein and US declaration of ceasefire/end of coalition war, or rather why has the postwar Iraq apparently and protractedly become more insurgent and violent than the war time? I shall examine the causes which underlie the spiral and escalating increase of environmental terrorism and the new forms of terror activities. In the war against terror, what options have peace and development?

2. The second approach shall focus on the environmental and regional impacts of the 9-11 inferno and the coalition war on the primary societies- the USA and Iraq. A comparative assessment of the impacts of environmental

terrorism on the two states/regions shall be established. What could be done but not done? The paper shall examine the possibilities for new framework of peace for both countries by identifying areas of common interests and mutual capabilities.

3. The impacts which the inevitable boundaries of terror and peace exert on the other world shall be the content of the third approach. The paper shall highlight the actual and potential risks indicators of the frontiers of peace/terror on international relations, the extent of spillovers and containment statistics.

4. The last section shall attempt to design a new framework that could minimize if not transform the volatility of the Middle East into an international capability for peace formations and sustainable development. This is based on the imperatives of the Iraqi experiences. The paper shall conclude with practical options for peace and development in the face of rising terror insurgencies; that is, how could the boundaries of terror become capabilities for world peace?

EIA AS A CONSENSUS BUILDING TOOL: THE HIDDEN CONTRIBUTION OF EIA TO INDUSTRY

Gonzalez, Ainhoa
Environmental Consultant
EIS Ltd.
6 Merrion Square, Dublin 2, Ireland UK
+44 01 6612142 Fax: +44 01 6769502

An unrecognized role of impact assessment is to provide language and structure for debate among diverse key stakeholders during the earliest stages of project conception.

The Interconnector Study prepared for Irish Rail in 2003 provides a good example of consensus building. The potential to provide an underground railway link in Dublin City was initially analyzed by a team of engineers. Feasible routes were identified which were considered to be viable in economical, technological and engineering terms. However, preliminary and parallel impact assessment facilitated communication between interested parties as well as identified potential environmental constraints and opportunities, thus playing a significant role in weighting the proposed route alternatives. The paper will illustrate how the early availability of rudimentary environmental constraints facilitated rapid narrowing of options for consideration by key stakeholders.

Notwithstanding the central importance of public consideration and participation in major public works projects, it is important to acknowledge the need for early "alignment" between key stakeholders when exploring fundamental feasibility. Impact assessment proves to be a key mediator, significantly contributing to engineering solutions and thus making a valuable contribution to complex decision-making processes.

Key words: *impact assessment, consensus building, feasibility study, public consultation, industry, infrastructure, Ireland*

WHO SAYS COMMAND-AND CONTROL DOESN'T WORK? CASE STUDIES OF CORPORATE ENVIRONMENTAL PERFORMANCE AND PUBLIC POLICY IN TAIWAN

Yap, Nonita T.
School of Environmental Design and Rural Development
Rm. 122 Landscape Architecture Bldg
University of Guelph
Guelph, ON N1G 2W1 Canada
+1 519 824 4120 (5-6536)
Fax: +1 519 767 1692

Taiwan's transformation from an agrarian to what is currently the 19th largest industrial economy in the world with the third largest surplus is nothing short of miraculous. The environmental costs of such an unprecedented rate of industrialization can be equally phenomenal. This paper reports on a study of waste management practices of thirteen selected firms in the central region of Taiwan. Contrary to expectations, all but two of the thirteen go beyond compliance. The approach taken is through cleaner production (or pollution prevention).

The paper analyses the decisions of the 13 firms, compares it with the analysis of corporate performance in other sectors as well as the progress reported on the government's voluntary and non-regulatory initiatives. It also presents some indicators suggestive of the state of the environment in Taiwan. The paper concludes that the key to the government's success in leveraging improved corporate environmental performance lies in (a) its ability to configure its policies and programs to create the appropriate incentives and disincentives; and (b) its credibility with the policy targets.

The government establishes credibility by having technically competent staff and consultants and by demonstrating its capacity to monitor, evaluate its performance and make mid-course policy corrections. Unlike the trend in developed countries, the government of Taiwan has significantly increased its environmental budget. It concludes with a brief description of the future challenges facing the country and brief observations on the approaches taken in rapidly industrializing countries in the region, specifically China and Vietnam and speculate on what lessons from Taiwan might be relevant to these two countries.

INDIGENOUS KNOWLEDGE AND ENVIRONMENTAL IMPACT ASSESSMENT IN DEVELOPING COUNTRIES: AN AFRICAN EXAMPLE

Appiah-Opoku, Seth
University of Alabama
230 Farrah Hall Box 870322
Tuscaloosa, AL 35487-0322 USA

+1 205 348 2731 Fax: +1 205 348 2278
sappiah@bama.ua.edu
www.ua.edu

Most developing countries are implementing institutional frameworks for environmental impact assessment (EIA) that are based on Western European and North American models. The potential contribution of indigenous knowledge to environmental assessment and management in these countries is often overlooked. Based on a field research in Ghana, this paper links two analytical initiatives. First, it examines critically the theories underlying EIA practice in developed countries and questions their appropriateness for a developing country like Ghana. Next, the paper examines Ghana's EIA procedure, and offers suggestions that could improve EIA process in the country and facilitate its adoption in other developing countries.

Key words: *indigenous knowledge, EIA model, institutions*

LINKING ENVIRONMENTAL EFFECTS TO HEALTH IMPACTS—A COMPUTER MODELLING APPROACH

Mindell, Jennifer
Imperial College London
31 The Fairway, Northwood HA6 3DZ England UK
+44 20 7594 3313 Fax: +44 20 7307 2825
j.mindell@imperial.ac.uk

Barrowcliffe, Roger
Environmental Resources Management Ltd
8 Cavendish Square, London W1G 0ER England UK
+44 20 7465 7200 Fax: +44 20 7465 7272
roger.barrowcliffe@erm.com

BACKGROUND. Despite being a statutory EU requirement, environmental impact assessment (EIA) seldom considers the impacts on human health. We describe a computer modelling approach to quantifying potential health impacts from predicted environmental impacts of a proposed waste incinerator in England. METHOD. Ground level concentrations of criterion air pollutants emitted from the incinerator were predicted using an air dispersion model and associated with a geographical information system (GIS) containing population data, to yield contour maps of additional annual average pollution exposure from the proposed plant. Systematic literature reviews examined the epidemiological effects of relevant pollutants. Unconfounded associations were assessed for the likelihood of being causal relationships, using the Precautionary Principle when the evidence was unclear. For each health effect of each of relevant pollutant, the potential health effect was calculated by multiplying together:

- the change in annual mean concentration of the pollutant
- the estimated effect of a change of one unit in pollution level (the effect estimate)
- the baseline regional rate of deaths or hospital admissions
- the number of people exposed to that change in pollution

The modelled air pollution contours defined the population to be included in primary analyses, as a large population exposed to even small increases may experience adverse effects. The calculations were conducted in a spreadsheet linked to the GIS, using discrete population and air pollution data for each enumeration district. We conducted sensitivity analyses using different:

- effect estimates, to allow for uncertainty
- background rates of disease, to allow for variation in background rate across the affected areas
- geographical area from the proposed plant for the exposed population

CONCLUSION. Even where the modelled changes in annual mean levels of pollutants are too small to be measurable, potential health impacts can be quantified.

Key words: *HIA, quantification methodology, GIS, computer modeling*

MODERNIZING EIA IMPLEMENTATION IN THE UNITED STATES

Miller, Anne Norton
Office of Federal Activities
U.S. Environmental Protection Agency (2251-A)
1200 Pennsylvania Avenue, NW
Washington, DC 20460 USA
+1 202 564 5400 Fax: +1 202 564 0070
miller.anne@epa.gov

Greczmiel, Horst
Council on Environmental Quality
722 Jackson Place, NW
Washington DC 20503 USA
+1 202 564 5750 Fax: +1 202 456 0753
Horst_Greczmiel@ceq.eop.gov

The EIA process in the United States, a statutory requirement under the National Environmental Policy Act, can and needs to be brought into the 21st Century. To that end, the Council on Environmental Quality (CEQ) in April 2002 established the National Environmental Policy Act (NEPA) Task Force. In May the task force, composed of federal agency employees with diverse skills, expertise, and perspectives, began its review of current NEPA implementation practices and procedures to determine opportunities to improve and modernize the NEPA process. The task force focused on six areas: technology and information management and security; federal and intergovernmental collaboration; programmatic analyses and tiering; adaptive management and monitoring; categorical exclusions (classes of activities generally exempt from extensive analysis); and environmental assessments. The task force interviewed NEPA practitioners from federal agencies; reviewed public comments, literature, reports, and case

studies; and spoke with individuals and representatives from state and local governments, tribes, interest groups and the public. The task force received comments from more than 700 respondents representing federal, state, and local governments, tribes, organizations, and individuals.

In September 2003 the Task Force submitted its report to CEQ, with recommendations that addressed the six focus areas and several issues that were raised in public comment and discussions with federal agencies concerning procedural aspects of the NEPA process. CEQ then sponsored four Regional NEPA Roundtables around the country to discuss the recommendations and solicit opinions from NEPA experts on what the priorities should be among the recommendations, recognizing that all cannot be addressed simultaneously. The Chair of CEQ will use information from the roundtables as he determines how the federal government in the near and long term will address the task force's work.

Key words: *EIA, environmental impact assessment, NEPA, impact assessment improvement*

IMPROVING ACCESS TO ROBUST EVIDENCE FOR HEALTH IMPACT ASSESSMENT

Mindell, Jennifer
London Health Observatory
11-13 Cavendish Square, London W1G 0AN England UK
+44 20 7307 2823 Fax: +44 20 7307 2825
jenny.mindell@lho.org.uk

Joffe, Michael
Imperial College London
m.joffe@imperial.ac.uk

Curtis, Sarah; Boaz, Annette
Queen Mary, University of London
s.e.curtis@qmul.ac.uk
a.l.boaz@qmul.ac.uk

Lock, Karen
London School of Hygiene and Tropical Medicine
karen.lock@lshtm.ac.uk

Biddulph, Jane
University College London
j.biddulph@pcps.ucl.ac.uk

Prospective health impact assessment (HIA) has a number of distinctive features:

- the focus on complex interventions or policy and their diverse effects on determinants of health
- the need for evidence on the reversibility of adverse factors damaging to health
- the diversity of the evidence (relevant disciplines, study designs, quality criteria and sources of information)
- the broad range of stakeholders involved; § the short timescale and limited resources generally available
- the pragmatic need to inform decision-makers regardless of the quality of the evidence.

These factors have implications for commissioning and conducting reviews. The Department of Health is funding work to develop guidelines for commissioning, conducting or peer-reviewing systematic and rapid reviews of the evidence for use in HIA. To inform our work and ensure the products are as useful and user-friendly as possible, we should like to run a workshop to enable discussion by HIA practitioners and academics. A first draft of the two sets of guidelines and results from interviews with individual practitioners will be presented briefly to set the scene, followed by group discussion led by experienced facilitators. The discussion will cover:

- what areas should be covered by the guidelines
- in what format(s) they should be presented

Key words: *HIA evidence method*

"IF YOU CUT THE FOREST, WE WILL DIE OF THIRST": HOW COMMUNITY EIA MADE A DIFFERENCE IN KENYA

Spaling, Harry
The King's University College
Geography & Environmental Studies 9125 - 50 Street
Edmonton, AB T6B 2H3 Canada
+1 780 465 3500 Fax: +1 780 465 3534
harry.spaling@kingsu.ca

The Kisayani water project proposes to pipe spring water to some 11,000 rural residents in Makueni District, Kenya. This would be the fifth extraction from the country's second largest spring. A 23-kilometre pipeline would traverse a forest reserve and a semi-arid, agro-pastoral zone. A community-based EIA of the project was under taken in 2002, one of the first of its kind under the new Environmental Management and Co-ordination Act. Although the Act requires public participation, community EIA also pays attention to increasing local capacity for sustainable resource management. This paper describes how communities participated in the EIA with a focus on traditional resource knowledge, significance assessment and relationship to other stakeholders. Findings show that communities had initial misconceptions about spring hydrology and the ecology of the forest reserve, as well as their management. Through participatory processes, communities became strongly motivated to work with state, private sector and other stakeholders in a partnership model that emphasized impact mitigation and monitoring, information-sharing, water conservation, forest protection, self-funded financing (water sales) and conflict resolution. The partnership's capacity for sustainable resource management was successfully tested during a local political campaign for the 2002 election.

Key words: *community EIA, water projects, partnerships, Kenya, Africa*

FROM REFUGEES TO REGULATIONS: ENVIRONMENTAL PROTECTION IN KOSOVO

Petersen, Martin
Golder Associates UK
Clyde House, Reform Road
Maidenhead, Berks SL6 8BY, England, UK
+44 7971 49 29 57 Fax: +44 7967 20 92 55
martin_petersen@golder.com
www.golder.se

This paper presents a holistic view of the environmental improvement programme carried out over a 4-year period during the post-conflict reconstruction of the infrastructure and economy in Kosovo following the cessation of hostilities in the summer 1999. A full range of projects were designed and implemented with funding from the Danish Ministry of Foreign Affairs (DANIDA), with specific focus on establishing waste management and recycling operations with both economical and environmental sustainability being the objective.

The paper starts with a synopsis of the environmental damage caused from numerous years of neglect to the environment of Kosovo, as well as that damage caused by the actual hostilities within Kosovo. Subsequent sections detail the projects implemented in chronological order, focusing initially on the collection and recycling of building rubble arising from the reconstruction works, through to privatisation of the environmental programme into a commercial company as well as the development of regulations for both hazardous and construction & demolition wastes.

Key issues dealt with in the paper include opportunities to increase employment for returning refugees, capacity building in the waste management industry, assistance to the Ministry of Environment and Spatial Planning on the development of regulations and legislation to protect the environment in line with EU environmental acquis. In addition, ways of integrating multi-ethnicity into the environmental programmes are also presented.

The paper concludes with a look at how the 4-year environmental improvement programme within the post-conflict reconstruction of Kosovo (2000-2003) proved a valuable step towards normalisation in the transition from relief to development. In addition, the Exit Strategy for the programme is presented with details on the economic, environmental and social impacts attained.

Key words: *post-conflict, wastes management, environmental management, recycling, capacity building*

WIND TURBINES, THREATENED SPECIES AND EIA: CAN THEY COEXIST?

Johnson, Stewart
Department of Primary Industries, Water and Environment
GPO Box 44, Hobart TAS 7001 Australia
+61 3 6233 2780 Fax: +61 3 6233 3800
Stewart.Johnson@dpiwe.tas.gov.au

Tasmania is a small island state about 240 km off the southeast coast of mainland Australia. The island is renowned for its natural heritage, with some twenty percent of the state listed by UNESCO as World Heritage. Tasmania's unique flora and fauna reflect the State's diversity of habitats and topography, and its Gondwana origins. The island is also a refuge to a number of species threatened on mainland Australia. It has more than 600 flora and fauna species listed as threatened.

Tasmania also has one of the best wind energy resources in the world. Principally driven by Federal Government greenhouse incentives, the State is the focus of wind energy prospectors, with a number of large scale developments proposed or under construction. The principal environmental issue for these developments is the potential for bird and bat collisions with wind turbines.

The environmental assessment for wind farm projects to date has involved determining avian movements in the project area, incorporating this data into collision risk assessment models, and assessing the impact of predicted collision rates on the population viability of key species.

Current proposals for several large-scale wind farms across the migratory pathway of the critically endangered Orange-bellied Parrot have highlighted a number of particular challenges for developers, EIA practitioners and decision makers.

Through the consideration of several recent case studies, this paper explores the following issues:

- Is this risk assessment approach appropriate for threatened species with low population numbers?
- Cumulative impacts on species from multiple wind farm projects? Would SEA help?
- Compensating for uncertain and unverifiable impacts? Is this an acceptable approach for decision-makers and an acceptable burden for developers?

Key words: *Tasmania, threatened species, compensating for impacts, cumulative impacts, wind farms*

COMMON SENSE IN ENVIRONMENTAL IMPACT ASSESSMENT: IT IS NOT AS COMMON AS IT SHOULD BE

Ross, William A.
Environmental Design
University of Calgary
Calgary, AB T2N 1N4 Canada
+1 403 220 6961 Fax: +1 403 284 4399
ross@ucalgary.ca

Morrison-Saunders, Angus
Murdoch University
South St., Murdoch 6150 Australia
+61 8 9360 6125 Fax: +61 8 9360 6787
angus@essun1.murdoch.edu.au

Several aspects of environmental impact assessment (EIA) seem to be in need of improvement. Reviews of EIA practice, particularly by industrial proponents, have highlighted common shortfalls. We believe these would benefit from more "common sense," which is not as common as it should be. For example, issue scoping usually ends up including far too many things, including issues that do not affect project decisions. Baseline data seem to be targeted more at collecting data than at understanding how systems (ecosystems, natural systems or social systems) function. Cumulative effects assessment seems intent on studying in far more detail than is appropriate a very large number of human activities rather than focusing on the more modest needs of decision makers. Follow up studies seem focused more on academic studies than on collecting information needed to manage projects. It is our intention to rant about these and possibly other examples of the failure of EIA to apply common sense, and in the process, to stir up discussion of how to improve EIA practices.

Key words: *EIA practice, improvements, common sense*

EXPLORING THE DIMENSIONS OF EIA FOLLOW-UP

Morrison-Saunders, Angus
Murdoch University
South St., Murdoch 6150 Australia
+61 8 9360 6125 Fax: +61 8 9360 6787
angus@essun1.murdoch.edu.au

Arts, Jos
Ministry of Transport, Public Works & Water Management
Transportation/EIA Centre
PO Box 5044, 2600 GA Delft, The Netherlands
+31 15 2518461 Fax: +31 15 2518555
e.j.m.m.arts@dww.rws.minvenw.nl

There is growing interest in EIA follow-up both within government and industry. Follow-up includes EIA projects and SEA plans, programs or policies and there is increasing regulatory requirement for EIA follow-up around the world. Additionally industry often makes an important contribution to follow-up through self-regulation undertakings. This paper will present an overview of current insights in EIA follow-up based on recent experience from around the world. It will review the theoretical foundation of EIA follow-up and will provide answers to the following questions:

- What is EIA follow-up?
- Why is follow-up important?
- Who is involved in EIA follow-up?
- What factors determine EIA follow-up outcomes in practice?

The presentation will also consider the different levels at which follow-up can be conceptualised: micro (or project) level, macro (or EIA system) level and the meta (overall practice of EIA internationally) level. The theoretical framework will be illustrated with best practice examples from around the world. The presentation will conclude with some challenges and future directions for EIA follow-up.

Key words: *EIA, EIA follow-up, SEA follow-up*

IMPACT ASSESSMENT AND EXPORT CREDIT

Radford, Greg
Export Development Canada
151 O'Connor Street, Ottawa, ON K1A 1K3 Canada
+1 613 597 8660
gradford@edc.ca

This paper discusses recent international initiatives aimed at incorporating the requirement to review environmental impact assessments into export credit agency (ECA) approval practices. In contrast to the World Bank and other multi-lateral development banks, ECAs have featured less in public debate until recently—but the sheer scale of investment and trade supported by ECAs worldwide means that they can play a significant role in the environmental impact assessment requirements placed on projects in developing markets. Government export credit agencies support exports by providing loan guarantees, export credit insurance and direct loans. In 2002, the amount of business covered by various ECAs was in the vicinity of US $50 billion. In particular, this paper outlines the requirements in the Organisation for Economic Co-operation and Development (OECD) Recommendation on Common Approaches on Environment and Officially Supported Export Credits that was adopted by the OECD Council on December 18, 2003. OECD Recommendations are not legally binding, but practice accords them great moral force as representing the political will of member countries and there is an expectation that member countries will do their utmost to fully implement a Recommendation. The Recommendation is an attempt to strengthen common approaches for evaluating the environmental impact of projects supported by ECAs with a view to ensuring that these meet established international standards.

Key words: *export credit, international finance, OECD*

CONDUCTING IMPACT ASSESSMENT BECAUSE IT IS THE RIGHT THING TO DO: THE WATERTON SEISMIC PROJECT 2003

Creasey, Roger
Shell Canada Ltd.
400, 4th Avenue S.W., Calgary, AB T2P 2H5 Canada
+1 403 691 4238 Fax: +1 403 691 2224
roger.creasey@shell.ca

Beswick, Bette
Golder Associates
1000, 940 - 6th Avenue S.W.
Calgary, AB T2P 3T1 Canada
+1 403 299 5614 Fax: +1 403 299 5606
bette_beswick@golder.com

Industrial proponents frequently consider a regulated EIA process to be a costly burden that must be overcome as part of a protracted government approval process. There also exists the view that EIAs provide too much opportunity for frivolous public intervention and become a tool to promote and fund unnecessary baseline research projects. In addition, some believe impact assessment to be a tool that solves a broad range of environmental issues that may be associated with a project. Too often, EIA practitioners lose sight of the benefits that an EIA can bring to a project's design and implementation.

In early 2003, Shell Canada proposed a 3D (three-dimensional) seismic program with the objective of defining future drilling prospects within the existing Waterton natural gas field. The area is mountainous, and is situated adjacent to internationally recognized protected areas. Recognizing that there is significant public interest in the environmental attributes of the area, and that the area possesses high biodiversity values, Shell decided to conduct an EIA despite the fact there was no regulatory requirement for such work.

This paper will describe the assessment and monitoring program conducted for the 2003 Waterton 3D Seismic program focusing on certain components of the overall EIA process. In addition, the paper will describe the project assessment process that is internal to Shell Canada, a process that helps to predict the environmental impacts and regulatory processes that will be applied to a project. The assessment, monitoring, and follow-up stages of the environmental protection measures adopted for the seismic program will be described, along with a summary of the value the EIA process brought to the project.

Key words: *impact assessment, environmental management, wildlife monitoring, oil and gas exploration*

DESIGNING SEA TO FIT ITS CONTEXT: THE CASE OF PRIVATISED ELECTRICITY COMPANIES

Jay, Stephen
School of Planning and Landscape
University of Manchester
Oxford Road, Manchester M13 9PL United Kingdom
+44 1612750680 Fax: +44 1612756893
stephen.a.jay@man.ac.uk

Marshall, Ross
Environment Agency
ross.marshall@environment-agency.gov.uk

It is increasingly recognised that environmental assessment has taken insufficient regard of the decision-making processes within which it is situated. This is becoming particularly evident in relation to SEA, where the range of activities and initiatives to which it might apply is far broader and more complex than for project-level EIA; SEA is consequently being driven to take greater cognisance of the decision-making processes that it is seeking to influence. Some commentators are seeking to address this by looking at the possible implications for SEA of different theoretical models of decision-making.

Despite this trend in SEA studies, relatively little empirical work has yet been done to analyse particular decision-making contexts, as a pre-requisite to understanding the potential for corresponding SEA systems. Research currently being undertaken aims to address this issue, by taking the UK electricity industry as a study area. As a privatised industry with statutory and corporate responsibilities that could be said to marginalize environmental concerns, this sector presents particular difficulties regarding the adoption of SEA procedures. This makes the analysis of the decision-making processes that operate within the industry all the more pertinent as a precursor to the design of appropriate SEA systems. This paper presents the preliminary results of this research, and suggests certain priorities that will enable SEA to take a more integral place within the operations of companies such as those studied here.

Key words: *strategic environmental assessment, electricity industry, decision making*

ENVIRONMENT AND SOLID WASTE MANAGEMENT IN LAGOS, NIGERIA

Adeyemi, Abraham Adesina
Sintos Consulting
46/48 Lagos Abeokuta Motor Road
Beside Jeodan Hospital
P.O. Box 605, Sango Oata, Ogun State, Nigeria
+234 8033767385/017900599
adeyemisintos@yahoo.com

This paper appraises and assesses the urban solid waste management in Lagos State, Nigeria, because solid waste management has been one of the most serious environmental problems in urban governance. Usually the more sound the understanding of the environment is, the more effectively it can be put at the service of human beings. Man cannot be separated from his environment. Therefore, waste management in urban areas has become more crucial than ever before. Waste disposal facilities, especially in recent

times, have proved most inadequate in the face of volumes of municipal waste. However, in tackling this problem, the national waste management strategy anchored on the concept of recycling, among others. The focus of the strategy is to invite America and Canada to come and invest in the lucrative business of waste management, with emphasis on recycling. While this is highly commendable, for effective and efficient program planning, an inventory of the recyclable materials in our waste is a necessary first step. People must be aware of what to separate from their waste stream. Major recyclable materials include plastics, scrap iron, aluminum and paper. It is worth noting that a standard recycling organization is not available in the country today. What we have are scavengers who engage in searching refuse heaps for what they can pick and quickly sell. They are the chief harbingers and heroes of the recycling industry in Nigeria today. Finally, there is a need to formulate an integrated development master plan to manage waste in all municipalities in Nigeria, creating an enabling investment environment to manage waste.

Key words: *environmental management system*

ENVIRONMENTAL IMPACT ASSESSMENT SYSTEM AND PRACTICE OF PUBLIC PARTICIPATION IN THE RUSSIAN FEDERATION

Kovalev, Nicole; Köppel, Johann
Technische Universität Berlin
Institut für Landschaftsarchitektur und Umweltplanung
Franklinstr. 28/29, 10587 Berlin Germany
+49 30 314 73337 kovalev@ile.tu-berlin.de
+49 30 314 22344 koeppel@ile.tu-berlin.de

The Environmental Impact Assessment (EIA) system in the Russian Federation has an extensive set of rules, the main ones are the Assessment of the Environmental Impact (OVOS) of a project and the State Environmental Review (SER). The SER is designed as an investigation of both a project and its OVOS by an independent expert commission, which is appointed by the federal and regional environmental bodies. The decision of the commission is binding. In addition, a Public Environmental Review (PER) can be conducted by NGOs and recognized by the state.

A mandatory component of the EIA in Russia is public participation. The process of public participation is regulated by Russian legislation (for example the Land Code, the Assessment of the Environmental Impact guidelines and autonomous regional laws) and can take various forms. The regulations for public participation meet the requirements of the Aarhus-Convention and partly go beyond them. But how are they applied in practice? This is to be investigated in the project supported by the Volkswagen Foundation and the Technical University of Berlin, in cooperation with the Russian Academy of Sciences, based on ecological expert reports (environmental test of projects). There are a number of case studies used to observe the extent to which the public has an impact on environmental decision-making. Selected cases include examples in which the public was passive, in which it undertook limited activities, and in which participation was strong and projects were improved or stopped, but institutional forms of public participation have to be completed by non-institutional forms. According to the current state of research, this situation can be seen as a step in a process, which results could certainly be the establishment of a democratic Russian society.

Key words: *Russian federation, state environmental review, public environmental review, referendum, public participation*

INNOVATIVE TRENDS IN STRATEGIC ENVIRONMENTAL ASSESSMENT IN THE UNITED STATES: FEDERAL LAND MANAGEMENT AGENCIES ARE LEADING THE WAY

Bass, Ron
Jones & Stokes
78 6th Street, Ashland, Oregon 97520 USA
+1 541 488 5767
rbass@jsanet.com

Strategic Environmental Assessments (SEAs), known as Programmatic Environmental Impact Statements (PEISs) in the U.S., have been a part of NEPA for more than 30 years. All federal agencies must prepare PEISs on their policies, plans, and programs. Thus, the two main federal agencies involved in land use planning and management—the U.S. Forest Service and the Bureau of Land Management—have a long track record in the field of SEA. Together, these two agencies have prepared hundreds of land management plans incorporating environmental values into their planning processes, as well as into the policies, objectives, and implementation measures of their land use plans. Yet, in recent years, both agencies have embraced new approaches to planning that more fully incorporate emerging SEA principles, such as:

- collaboration
- environmental justice
- sustainability
- adaptive management

This paper will summarize the efforts that the federal land management agencies are taking to incorporate these and other innovative principles into the environmental assessment of land use and resource management plans.

Key words: *strategic environmental assessment, programmatic environmental impact statement, federal land management agency*

COMMON MISTAKES IN ENVIRONMENTAL IMPACT ASSESSMENT AND HOW TO AVOID THEM

Bass, Ron
Jones & Stokes
78 6th Street, Ashland, Oregon 97520 USA
+1 541 488 5767
rbass@jsanet.com

Throughout the world, national and local governments annually prepare, or oversee the preparation of, thousands of environmental impact assessments (EIAs) (e.g., environmental impact statements). Despite the ubiquitous nature of EIA laws and practice, many professionals still make serious and recurring mistakes in developing EIAs. These mistakes can lead to biased or unreliable documents, mistrust of the EIA process, and in some cases, legal challenges to the adequacy of the document or the environmental review process itself.

For example, some agencies decide in advance that they will not require an EIA for a project, then try to justify that conclusion despite being presented with information about significant environmental impacts. Others do a poor job of scoping out the content of an EIA or leave all key decisions to project developers. Still others fail to seek the advice of expert agencies and the public. Additionally, some key issues, such as the choice of alternatives and evaluation of cumulative impacts, continue to perplex even the most seasoned professionals.

These are just several of many recurring mistakes that agencies make in preparing EIA documents that can lead to problems. This presentation will highlight some of the most common mistakes, provide examples of how they arise, and suggest solutions to avoid them.

Key words: *common, EIA, mistakes, avoid*

ENVIRONMENTAL PRODUCT DECLARATION - A CORPORATE COMMUNICATION TOOL

Setterwall, Caroline
SwedPower AB
Nedre Läsarbo 5, Söderbärke SE-777 93 Sweden
+46 223 55103
caroline.setterwall@swedpower.com

Rydgren, Bernt
SwedPower AB
Box 1842, Linköping SE-581 17 Sweden
+46 13 254322
bernt.rydgren@swedpower.com

In 1993 Vattenfall—a large electricity generator in Northern Europe—decided to start working with life cycle inventories (LCI). The objective was in-house capacity building, in order to be prepared for society's budding interest regarding life-cycle approaches. The inventories were focussed on Vattenfall's own assets in the fields of hydropower, nuclear power, bio-fuelled combined heat and power, oil-based reserve power, a planned natural gas-fired plant, and coal power. The work was carried out in co-operation with universities and other recognised experts in the field of LCI. As the corporate awareness about the LCI methodology and results grew, a commitment to communicating these to the public was accompanied by a growing expression of public interest in this kind of information. Thus, in 1996 Vattenfall published its first official LCI report. Soon the need for a more standardised way of communicating these rather complicated issues were realised, and Vattenfall initiated methodology development based on ISO TR 14025 Type III Environmental Declarations, together with a competitor and ELFORSK, the Swedish Electrical Utilities' R&D Company. It was decided to include not just LCI results regarding the studied power plants, but also information on environmental risks, radiology and impacts on biodiversity into Environmental Product Declarations (EPD) on electricity generation. In 1999 Vattenfall's and the world's first ISO-based, third party-certified EPD was published. Now, in early 2004, Vattenfall has five EPDs that are being updated continuously. In this paper Vattenfall's motives and incentives for working with Environmental Product Declarations are illuminated and elaborated.

Key words: *life-cycle inventory, environmental product declaration, corporate communication*

QUANTITATIVE BIODIVERSITY IMPACT ASSESSMENT: FIVE YEARS OF USING THE BIOTOPE METHOD©

Kyläkorpi, Lasse
SwedPower AB
Box 527, Stockholm SE-162 16 Sweden
+46 8 7396021
lasse.kylakorpi@swedpower.com

Rydgren, Bernt
SwedPower AB
Box 1842, Linköping SE-581 17 Sweden
+46 13 254322
bernt.rydgren@swedpower.com

During the late 1990s, a method for biodiversity impact assessment was developed in the Vattenfall Group in Sweden, in order to address biodiversity impacts in quantitative environmental product declarations for electricity generation. The method was named the Biotope Method© and is based on measurements of land use-induced biotope alterations. These alterations are used as an indicator of the impact on biodiversity, facilitating quantitative measurements of, and comparisons between, different projects, e.g., power developments. The method includes tools necessary for the classification and characterisation of the areas affected, and results in transparent and quantitative data. The results are related to the amount of produced good (here: electric energy), thus enabling comparisons between different developments such as power stations or power systems. During the past five years, a number of methodological applications to various electricity generation technologies, such as hydropower, nuclear power, forestry residues for

biomass electricity and wind power, have been conducted. In this paper, the results of these applications are analysed and compared, and suggestions for further methodology development and other possible applications are discussed.

Key words: *biodiversity, electric energy*

AN INVESTIGATION OF THE RELATIONSHIP BETWEEN THE HIGHER DECISION-MAKING PROCESSES AND THE STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) IN THE UNITED KINGDOM

Mun, Sangsoo
Oxford Brookes University
School of the Built Environment
Department of Planning, Headington Campus
Gipsy Lane, Oxford, OX3 0DU UK
+44 (0) 1865-483412 Fax: +44 (0) 1865-483559
sangsoomun@brookes.ac.uk

According to the EU Directive 2001/42/EC Article 4.3 (Official Journal of the European Communities, 2001), a hierarchy of SEA is required within policy, plan and programme (PPP) to avoid duplication of assessment. To make a strategic assessment, environmental assessment must take place at the highest decision-making level of the PPP. This has often been referred to as being in a "nested" or "tiered" relationship with the policy proceeding the plan, the plan the programme, and the programme the project (Marsden & Dovers, 2002). However, the decision-making process is often inconsistent and unpredictable, which hinders the application of SEA. This article suggests that it is important to understand the relationship between the PPP making processes and the SEA tiered approach to achieve a better SEA implementation and to produce beneficial interactions between different governmental levels. Currently, SEA is in its infancy in practice, compared to the applications of sustainability appraisal (SA) in the UK. However, the concept of SA in the UK has grown out of SEA and Environmental Appraisal of Development Plan (EDPA). It aims to incorporate environmental, social and economic dimensions into one form of appraisal practice, rather than having separate appraisals. As case studies, the SAs of structure plan of two county councils have been selected from the South East Region. The links between regional government and these two county councils with regard to their PPP implementation and appraisal have been examined.

Furthermore, the links with SAs of the local plans, mainly at district level, have also been investigated to identify any potential tiered approaches between these two levels. The report suggest that it is still unclear whether there is sufficient understanding of the relationship between decision-making and SEA in practice, although the latter has been applied in many ways at different levels of government in the UK.

Key words: *strategic environment assessment, sustainability appraisal, decision-making process, tiered approach.*

CANADIAN APPLICATION OF EIA TO AGRICULTURE, FORESTRY AND FISHERIES: AN OVERVIEW

Duffy, Patrick J. B.
P.J.B. Duffy and Associates Limited
5839 Eagle Island, West Vancouver, BC V7W 1V6 Canada
+1 604 921 6119 Fax: +1 604 921 6664
pjbduffy@cs.com • http://ourworld.cs.com/pjbduffy/

Since the inception of EIA some thirty years ago, the focus has been on infrastructure projects with much less emphasis on natural resource management practices. As a generality, agriculture, forestry, and fisheries have not benefitted from systematic environmental analysis and management. EIA is seldom applied to farm practices and to forestry or fisheries planning and operations. As a consequence some serious environmental and natural resource degradation has taken place. Even though there are exceptions and surrogates in some cases, resources are degrading in many regions, and poverty and income disparities continue to grow.

These sectors have been largely excluded from EIA policies and practices in many jurisdictions, including the Canadian federal and provincial governments. Experience has shown that some of the degradation could have been avoided if these exclusions had not been made over the past 30 years. Recent work has demonstrated that EIA has important potential to predict and mitigate negative effects of large and small projects and practices in these sectors,

Based on contributions from specialists in the provinces and territories of Canada, and related research, I will present an overview of of the status quo on the application of EIA to these sectors. This will include observations and recommendations on the present gaps in practice and the apparent realizable benefits of extending the application of EIA for industry and governments.

Key words: *EIA for forestry industry, EIA for agriculture industry, EIA for fisheries industry, EIA policy and procedure, environmental degradation from poor natural resource management planning*

CONCEPTUALISING SUSTAINABILITY ASSESSMENT: THREE MODELS AND A CASE STUDY

Pope, Jenny
Institute for Sustainability and Technology Policy
Murdoch University
25 Gold St., South Fremantle WA 6162 Australia
+61 8 9431 7554 Fax: +61 8 9431 7031
jennypope@bigpond.com

Sustainability assessment is being increasingly viewed as an important tool to aid in the shift towards sustainability. It is often described as a process by which the implications of an initiative on sustainability are evaluated, where the initiative can be a proposed or existing policy, plan, programme, project, piece of legislation, or a current practice or activity.

However, this generic definition covers a broad range of different processes. This paper looks beyond the generic definition to examine the fundamental question of what sustainability assessment could, and should, be.

It does this firstly by reviewing the different approaches described in the literature as being forms of sustainability assessment and evaluating them in terms of their potential contributions to sustainability. Three distinct models for sustainability assessment are identified and labeled: "EIA-driven integrated assessment," "objectives-led integrated assessment," and "assessment for sustainability." The first two are forms of integrated assessment, derived from environmental impact assessment (EIA) and strategic environmental assessment (SEA), extended to incorporate social and economic considerations as well as environmental ones, reflecting a "triple bottom line" (TBL) approach to sustainability. In contrast, "assessment for sustainability" is based upon defining the concept of sustainability in terms of criteria against which a proposal is assessed to determine whether or not it is, or is not, sustainable.

To illustrate the potential application and implications of these models, the case study of the recent assessment of the Gorgon Gas Development by the Government of Western Australia is discussed. The assessment process applied was an example of "EIA-driven integrated assessment" and some of the lessons learnt from this example are briefly outlined. The question of whether the outcomes of the assessment process would have been different had a different sustainability assessment model been applied is then considered.

Key words: *sustainability, sustainability appraisal, sustainability assessment, sustainability impact assessment, sustainable development*

STRATEGIC ENVIRONMENTAL ASSESSMENT BENEFITS TO INDUSTRY: A CASE STUDY OF INTEGRATED SEA IN SASKATCHEWAN'S FORESTRY SECTOR, CANADA

Noble, Bram
University of Saskatchewan
Department of Geography
9 Campus Drive, Saskatoon, SK S7N 5A5 Canada
+1 306 966 1899
b.noble@usask.ca • www.usask.ca

Recent efforts to design and implement strategic environmental assessment (SEA) frameworks have focused predominately on government policy, plan and program decision-making with very little attention given to SEA for industry planning. As a result, the potential benefits of SEA to industry, as a valuable business tool in addition to its assessment role, have yet to be fully realized amongst industrial proponents. That said, SEA practice in ongoing, albeit informal and often under a different label, and is proving to be a valuable tool for industry. The purpose of this paper is to illustrate the added value of integrating SEA with industry planning and decision-making practices. In this paper "integrated SEA" simply refers to the merging of SEA principles and practices with decision-making to ensure that environmental considerations are fully addressed in all stages of resource development. When SEA and the planning process unfold simultaneously industry can, arguably, benefit from a more streamlined and efficient environmental assessment and regulatory approval process, the availability of information concerning potential impacts of decision options as the planning process unfolds, quality assurance with regard to meeting industry standards and policy requirements, early and demonstrated compliance with guidelines and regulations, and increased likelihood that the plan or proposed course of action will be acceptable. Based on a case study of the Pasquai-Porcupine forest management plan assessment in Saskatchewan, Canada, this paper illustrates how integrated SEA, even though not always implemented under a formal SEA system, can contribute to industry decision-making practices and enhance the quality and deliverability of industry plans.

Key words: *strategic environmental assessment, industry, forestry, Saskatchewan, Canada*

BIODIVERSITY AND EIA FOR ROAD AND RAILWAY PROJECTS, A REVIEW IN EUROPEAN UNION COUNTRIES

Gontier, Mikael; Balfors, Berit; Mörtberg, Ulla
Department of Land and Water Resources Engineering
Royal Institute of Technology
Brinellvägen 28, Stockholm SE-100 44 Sweden
+46 8 790 7377
gontier@kth.se
balfors@kth.se
mortberg@kth.se

The introduction of the biodiversity concept or biodiversity related issues in the EIA context is rather recent and often a direct consequence of the definition of new national environmental policies. Well accepted in the scientific community, providing a universal scope to many discussions, it still remains abstract to many practitioners. How to perform prediction, assessment and evaluation of biodiversity issues still needs to be developed. The change in the terminology can be an opportunity to look at old problems with new eyes, but it remains to investigate whether these discussions can be found in today's Environmental Impact Statements (EIS). A review study was conducted on EIS reports from four different countries that are members of the European Union and therefore sharing an EIA legislation based on the European Union directive on EIA. The aim of the review study was to identify the gap and the needs in the current practices when dealing with impact prediction and evaluation of biodiversity issues and to analyze potential ways of improvement. A review checklist was designed and used to review the EIS reports in a systematic way. Some of the main focuses of the checklist were to characterize the methods, terminology and data that had been used for prediction and evaluation of impacts concerning biodiversity

issues. The paper presents an overview of the review results and shows the diversity that can be encountered in today's EIS for the road sector within and in between countries having the same basis for their EIA legislation. It also opens the question and discussion on the need to improve the understanding of biodiversity related impacts.

Key words: *EIA, biodiversity, review, road and railway projects, prediction*

EIA FOLLOW-UP: A CASE OF THE INDIAN OPEN CAST COAL MINES (poster)

Jha (Thakur), Urmila
University of Liverpool
74 Bedford Street South, Liverpool, Merseyside
L69 7ZQ United Kingdom
+44 01517943453
urmi@liv.ac.uk

Environmentally sustainable decision-making involves issues of complexity, uncertainty and information feedback. Over the past few decades, EIA has played an important role in supporting decision-making processes. However, EIA needs to be strengthened in order to live up to its potential. In this context, follow-up is of particular importance for filling the "implementation gap." This poster reviews follow-up activities carried out in the context of opencast coal mining in India, making reference to a number of case studies. Based on examples of similar practices worldwide, suggestions for improving current practice in India will be made.

Key words: *EIA follow-up, open cast coal mine, India*

INTEGRATED AND TRANSPARENT ENVIRONMENTAL IMPACT ASSESSMENT IN NUNAVUT (poster)

Wilson, Peter
Nunavut Planning Commission
130 Albert Street Suite 1902
Ottawa, Ontario K1P 5G4 Canada
+1 613 238 0837 Fax: +1 613 238 5724
pwilson@npc.nunavut.ca • npc.nunavut.ca

The Nunavut Planning Commission (NPC) is responsible for land use planning and other aspects of environmental management in Canada's newest territory. One of the NPC's main responsibilities under the Nunavut Land Claims Agreement is to determine whether project proposals for resource use and development conform to the rules in land use plans. In fulfilling this responsibility, the NPC must work closely with other land claim and government agencies, such as the Nunavut Impact Review Board, the Nunavut Water Board, Nunavut Tunngavik Incorporated and Regional Inuit Associations (the owners and managers of Inuit-owned land), the federal Department of Indian and Northern Affairs, the Department of Fisheries and Oceans, and others. In Nunavut, effective environmental impact assessment depends on long-distance workflow coordination amongst these numerous agencies. Inter-agency cooperation has been achieved through the development of a one-window Internet application called PLANNER, which enables potential land users to apply for land use permits and other authorizations online. The NPC's poster presentation about PLANNER at IAIA 2004 describes the rationale for, and functionality of, this integrated land management system. Aside from its integration with other land management agencies, the NPC also has a responsibility to ensure that its land use plan conformity determinations (a form of environmental impact assessment) are completed in a systematic, consistent, fair, transparent and efficient manner. This requires integration of issues and rules from regional land use plans with related digital data, GIS functionality, metadata, and legal undertakings. The second part of the NPC's poster presentation describes the development and functionality of a custom-written software application that has dramatically improved the way the NPC conducts its assessments.

Key words: *Nunavut, land use, Internet, decision-support, software*

A QUALITY AND EFFECTIVENESS REVIEW PROTOCOL FOR STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) PRACTICE IN SOUTH AFRICA (poster)

Retief, Francois
School of Planning and Landscape
University of Manchester
Oxford Road, Manchester, M13 9PL, UK
+44 (0)161 275 6887 Fax: +44 (0)161 275 6893
francois.p.retief@stud.man.ac.uk

Jones, Carys; Jay, Stephen
EIA Centre, School of Planning and Landscape
University of Manchester
Oxford Road, Manchester, M13 9PL, UK
+44 (0)161 275 6873 Fax: +44 (0)161 275 6893
carys.jones@man.ac.uk
stephen.a.jay@man.ac.uk

Sandham, Luke
School of Environmental Sciences and Development
North West University
Private Bag X6001, Potchefstroom, 2520 South Africa
+27 (0)18 299 1585 Fax: +27 (0)18 299 1580
ggflas@puknet.puk.ac.za
ggflas@puknet.puk.ac.za

Review of quality and effectiveness is an essential component of any environmental assessment system in order to identify best practice and to facilitate continual improvement. In recent years the challenges involved with the review of Strategic Environmental Assessment (SEA) became apparent in the wake of the success achieved with project level assessment review. These challenges arose primarily due to the multiple forms of SEA and the complexity of the different contexts in which they are conducted, that do not allow for

a generic list of review criteria to be applied universally. This research presents a context specific SEA review protocol designed to evaluate the quality and effectiveness of plan and programme level SEAs conducted within the South African context. The protocol consists of a review approach, principles and a framework, as well as key performance areas (KPAs) and key performance indicators (KPIs) designed to measure the quality of inputs and effectiveness of outputs. This allows for a holistic interpretation of the cause and effect relationships between inputs and their results. Findings based on the application of the protocol to a specific pilot study suggested that it was methodologically sound and sufficiently robust to warrant wider application within the South African context.

Acknowledgements: The research received financial support from the Association of Commonwealth Universities (ACU) and the British Council.

Key words*: review of strategic environmental assessment (SEA) practice in South Africa, SEA in developing country contexts, SEA quality and effectiveness*

COMPARATIVE STUDY ON THE EIA BETWEEN REPUBLIC OF KOREA AND CHINA—IN CASE OF GOLF COURSES (poster)

Kwon, Young Han; Choi, Jaeyong; Jeong, Ick Cheol
Korea Environment Institute
613-2 Bulgwang-dong
Eunpyeong-gu, Seoul 122-706 Korea
+82 2 380 7660 Fax: +82 2 380 7744
yhkwon@kei.re.kr

This study aims to compare the Environmental Impact Assessment (EIA) systems in Korea and China to obtain a better knowledge of environmental conservation policies in both countries. Although the EIA systems in both countries were initiated in 1980s, the actual supporting policies and actions began in the early 1990s. In Korea, the EIA Act was enacted in 1993, and replaced by the Integrated Impact Assessment Act in December 1999. The independent law of the EIA in China was adopted in 2002 and enacted in September 2003. While activities requiring EIA consist of 62 project types in 17 fields in Korea, China utilizes the screening methods to decide on the activities.

A case study was carried out by comparing the EIA systems of golf course development in both countries. Preparation, review process, approval process, and contents of the Environmental Impact Statements (EIS) of both countries were compared. The draft, EIS, and supplements were prepared and reviewed for approval of the EIA in Korea, whereas only the draft and EIS were reviewed for ratification in China. Review process of the EIS was generally similar, but operation of the processes was slightly different from each other. Scope, season, and number of investigations on the item (e.g., ecosystem) in the EIS were more detailed in Korea than in China. Impact evaluation and mitigation methods were provided more likely with a fixed and superficial format in the Korean EIS. In contrast, those in the Chinese EIS were theoretical and nonspecific to minimize the impacts. The method of public participation was different in both countries. This study suggested that the EIA system could be improved by adopting the good points from each other.

Key words: *environmental impact assessment, environmental impact statement, golf course, Korea, China*

APPLICATION OF GROUNDWATER RESOURCES INVESTIGATION TO ENVIRONMENTAL IMPACT ASSESSMENT IN KOREA: CASE STUDY ON TUNNEL AND LANDFILL CONSTRUCTION SITE (poster)

Lee, Jeongho; Lee, Hyun-Woo
Korea Environment Institute
613-2, Bulgwang-Dong
Seoul, Eunpyeong-Gu 122-706, Republic of Korea
+82 2 380 7682 Fax: +82 2 380 7744
sr87sr86@kei.re.kr
hwlee@kei.re.kr

Park, Young Min
Korea Environment Institute
+82 2 380 7676 Fax: +82 2 380 7744
ympark@kei.re.kr

Lee, Young-Joon
Korea Environment Institute
+82 2 380-7763 Fax: +82 2 380 7744
yjlee@kei.re.kr

Park, Chang-Suk
Korea Environment Institute
+82 2 380 7771 Fax: +82 2 380 7744
plade290@kei.re.kr

The investigation of groundwater in environmental impact assessment (EIA) of Korea focuses on quantitative forecast and reduction-plan establishment about contamination or head drawdown of the potable and agricultural groundwater during tunnel excavation, landfill construction or laying of the facilities inducing groundwater contamination. The basic data for groundwater impact investigation correspond to the topographic variation, distribution of groundwater level in neighboring wells, hydraulic properties of the aquifer, various boundary conditions (i.e., coast or watershed boundary, drainage condition, quantity of groundwater inflow to sink), precipitation, and evapotranspiration. The final results of groundwater investigation using such data could be obtained from numerical simulation of groundwater flow and contaminant transport modeling. MODFLOW, MT3D, and their subordinate modules are used to calculate the numerical results of those modeling. The EIA of groundwater related to railroad construction targets the outflow of groundwater and estimation of head drawdown in the adjacent wells by tunnel excavation. In the case of a tunnel showing 2,000m3/day of groundwater outflow, the head drawdown at steady state flow condition was simulated to less than 1.0m at the wells whose maximum distance from

tunnel is in the range of 300m. These results indicated that the groundwater resources could not be affected by tunnel excavation, supposed that specific geological structures (i.e., fracture or fault) which jump the movement of groundwater were not observed. The contaminant transport modeling of waste landfill site depends on the flow direction of groundwater and topographic relief of corresponding site. The results of transport modeling at transient flow condition concluded that more than 200 mg/l of chloride was leached to groundwater unless certain slurry wall system blocking groundwater flow was not installed.

Key words: *EIA, groundwater, modeling, modflow, tunnel, landfill, drawdown, transport*

EIA: INDUSTRY AND ENERGY DEVELOPMENTS IN ICELAND (paper and poster)

Sigurðardóttir, Hólmfríður; Ásbjörnsson, Sigurður
The Planning Agency
Laugavegur 166, Reykjavik, S-Vesturland 150 Iceland
+354 595 4100 Fax: +354 595 4165
frida@skipulag.is
sas@skipulag.is

Per capita electricity use in Iceland is very high in comparison to other Western Countries. Hydropower provides 83% of the electricity use while geothermal energy provides 17% and oil 0,1%. Heavy industrial electricity use, especially in the aluminum industry, has doubled during the past decade and by the end of 2000 it was 65% of the total electricity use in the country. A governmental institution, the Planning Agency, oversees the EIA process in Iceland. Energy resources in Iceland are closely associated with the country's glaciers, glacial outwash rivers and volcanism. The chief environmental factors that have been under consideration in the EIA process regarding aluminum smelters, power lines and power plants in Iceland are:

- socio-economic effects
- air and marine pollution
- flora and fauna
- landscape and visual effects
- geologic factors
- tourism and other land use aspects
- cultural relics

These factors are scale and location dependent. Foreign interest and demand for electricity for the aluminum industry has increased substantially and decisions at the policy level have been made to increase aluminum production in Iceland during the first decade of the 21st century which would triple the scope of heavy industry in the country. In light of this increasing interest, a more comprehensive policy has been called for regarding the exploration of locations for power plant and dam sites in Iceland with the aim of prioritising feasible options in view of the areas' nature, sensitivity and natural value. The poster will address the above-mentioned issues in view of the Planning Agency's practical EIA experience on aluminum smelters and related energy developments in Iceland.

Key words: EIA, *aluminum smelters, power lines, power plants, energy utilisation, Iceland*

IMPACT AND BENEFIT AGREEMENTS: DO THE ROSS RIVER DENA BENEFITS FROM MINERAL PROJECTS? (poster)

Dreyer, Doris
University Of Northern British Columbia (UNBC)
3333 University Way, Prince George, BC V2N 4Z9 Canada
+1 250 960 5671 Fax: +1 250 960 5546
dreyer4@yahoo.com

Impact and Benefits Agreements (IBAs) are arrangements between aboriginal communities and industry to secure long-term local benefits from resource development projects. These local benefits include matters such as employment, training, economic development, business opportunities, social, cultural and community services, environmental protection, and cash payments. Despite the increasing use of IBAs in northern Canada, Alaska and northern Russia only limited information is available about key requirements for successful IBAs. This paper presents a case study undertaken in collaboration with the Ross River Dena First Nation (Yukon). The study analyses the process and implementation success of two IBAs negotiated by the Ross River Dena for mineral projects through the use of a theoretical IBA framework. The purpose of this study is to improve the understanding of IBA processes, and thus enhance long-term economic development planning of aboriginal communities in remotely located communities with mineral development potential.

Key words: *impact and benefits agreements, IBA, socio-economic agreements, economic development, aboriginal peoples, indigenous peoples, Yukon*

THE ROLE OF ENVIRONMENTAL ASSESSMENT IN PROJECT PLANNING, DESIGN AND CONSTRUCTION: TERASEN'S FRASER RIVER CROSSING PIPELINE REPLACEMENT PROJECT (poster)

Gamble, Don
Golder Associates Ltd.
Suite 202- 2790 Gladwin Road
Abbotsford BC, V2T 4S8 Canada
+1 604 850 8786 Fax: +1 604 850 8756
dgamble@golder.com • www.golder.com,

Jones, Christy
Golder Associates Ltd.
+1 604 850 8786 Fax: +1 604 850-8756
cjones@golder.com • www.golder.com,

Brown, Darren
Golder Associates Ltd.
Suite 500- 4260 Still Creek Drive
Burnaby, BC V5C 6C6 Canada
+1 604 298 6623 Fax: +1 604 298 5253
dabrown@golder.com • www.golder.com

Terasen Pipelines Inc. transports crude oil and petroleum products via a high-pressure transmission pipeline from Edmonton, Alberta, to its Burnaby, B.C., terminal. The section of this pipeline beneath the Fraser River downstream of the Port Mann Bridge was determined to be at risk during seismic events. Terasen required the horizontal directional drill installation of a 1.3-km long replacement pipeline below the liquefaction zone, corresponding to approximately 23m below the riverbed.

As the project required approval from the National Energy Board, an environmental assessment under the federal Canadian Environmental Assessment Act was required. Terasen engaged Golder Associates Ltd. to conduct the Environmental Assessment to assess the biophysical and cultural impacts associated with the construction and operation of the replacement pipeline, and to develop recommended mitigation measures, including environmental and archaeological protection plans, for minimizing or precluding adverse effects. As part of the assessment, Golder consulted with First Nations and other stakeholders.

The protection plans provided performance-based standards for achieving the mitigation measures such as handling of drilling fluids, noise control, site restoration, and impact management procedures to be undertaken in the event that an archaeological / historical site was discovered during construction. Construction of the pipeline required the removal and disturbance of riparian vegetation along Como Creek in Coquitlam and Dingwall Creek in Surrey. These riparian areas were considered to provide marginal food/ nutrient habitat value for aquatic species. In conjunction with Terasen's landscape consultant, Golder developed a habitat compensation plan for review and approval by Fisheries and Oceans Canada, which afforded opportunities for enhancing habitat within the affected watercourses.

The project was approved in summer 2003, and construction was completed by fall of 2003. Golder provided monitoring during construction to evaluate and report on the effectiveness of the mitigation measures implemented, and to advise on protection of environmental resources.

Key words: *environmental assessment, horizontal directional drill, riparian, mitigation, environmental protection plan*

TOWARD AN INTERDISCIPLINARY ASSESSMENT OF POLICIES (poster)

Oleson, Kirsten
Stanford University
729 Escondido Rd, Apt 232, Stanford, CA 94305 USA
+1 650 380 3950
koleson@stanford.edu

This poster will explore the possibility of assessing policies using an interdisciplinary approach. The poster will contain the following basic elements. First, interdisciplinary, as opposed to multi-disciplinary is defined, based on a review of current literature and academic work. Second, I defend why a move toward an interdisciplinary approach is warranted, particularly for analysis of complex environmental problems. Third, some key case studies in applying such an approach are presented. Fourth, challenges and lessons learned are identified, including methodological and approach questions, consensus building, dissemination of interdisciplinary work, and validation within disparate fields. Finally, I explore how to apply the approach to the analysis of policies.

Key words: *interdisciplinary, policy analysis*

EIA AND THE ANTARCTIC TOURISM INDUSTRY (poster)

Gee, Dianne
University of Tasmania
96 Bangalee Street, Hobart, Tasmania 7021 Australia
+61 3 6248 1262
df_gee@utas.edu.au

Antarctica is an ecologically fragile and unique environment that supports an established tourism industry. This industry has characteristics that include a short season, coinciding with peak wildlife breeding seasons; repetitive site visitation by multiple companies; an emphasis on self-regulation; and a gradual expansion in both overall tourist numbers and the range of activities offered. Whilst the politico-legal structure governing the industry is complex, the visitor management framework, particularly as this relates to the environment, is relatively simple. The industry is highly reliant on the use of environmental impact assessment as the key management tool for all levels of activity, from transitory to semi-permanent/permanent (station) operations. In contrast to EIA frameworks elsewhere, the EIA process within the Antarctic tourism industry operates in a virtual management void. Key aspects of EIA, including scoping, critical assessment, monitoring and auditing are either poorly developed or absent. Responsibility for the preparation of tourism EIAs rests with tour operators, who submit EIAs to the relevant national government for assessment. The process demonstrates little critical analysis of proposed activities by either operators or national governments. For example, EIAs from all companies follow a common reporting format, with visitation data updated seasonally by individual companies. Assessment of alternatives to planned activities, or monitoring and post-visit reporting of activities, is

absent. This study forms part of a postdoctoral research project examinining the structures attending EIA in the Antarctic tourism industry, including the effectiveness and appropriateness of this management method to address issues facing the industry. The research focuses on the process of EIA development and preparation; content of individual EIAs; and post-activity follow-up, including potential auditing.

Key words: *tourism, environmental impact assessment, Antarctica*

INTERACTIONS AMONG HYDROLOGIC FACTORS AND DOMESTIC AND URBANIZATION ACTIVITIES IN THE PATZCUARO WATERSHED, MEXICO (poster)

Rodriguez Trejo, Eduardo; Ducoing Chaho, Edmundo; Ramírez Romero, Patricia
Universidad Autonoma Metropolitana
Av. San Rafael Atlixco 186
Col Vicentina, Del. Iztapalapa, CP 09340, D. F. México
+52 0155 5558044747 Fax:+52 0155 5558044738
edch@xanum.uam.mx

Knowledge about alpine lakes in the tropics is scarce. Ecological alterations, watershed degradation and natural resources over exploitation have had a negative impact on food production and rural economy. Patzcuaro is a lake located 2035 m above sea level, in the State of Michoacan, Mexico, between 19°31' - 19°42' N and 101°32'-101o43'W. This lake has been irrationally exploited and it is now in an accelerated state of ecological degradation. The objectives of the present study were to establish an order to identify, evaluate, describe and predict the changes in environmental quality, also to find a correlation among size, magnitude and importance; and measures to avoid mitigate, the environmental damages. After compiling environmental information, the interactions between hydrologic factors and human activities were identified and assessed, then the impacts were described and mitigation measures were proposed. Results showed that water quality has been modified mainly due to the incorporation of nutrients, organic matter and pollutants coming form untreated waste water and indirectly from solid residues that are not properly disposed of. Evident effects are the increment in nutrient concentrations, loss of transparency, high concentrations of bacteria and a reduction of aquatic organisms populations, all of which has been observed in the past two years' samplings. In conclusion, the discharge of untreated waste waters and soil transport through erosion are the main causes of the water quality change in the lake, together with the present day management of solid residues that cause direct impacts on soil and indirect on the lake; furthermore, mitigation measures will only be effective under a program designed and applied in an integral form.

Key words: *ecological alterations, environmental quality*

THE USE OF THE ENVIRONMENTAL BREACH FOR THE EVALUATION OF CUMULATIVE AND RESIDUAL IMPACTS OF THE OIL INDUSTRY ACTIVITIES IN MEXICO (poster)

Ducoing Chahó, Edmundo; Silva Torres, Beatriz, Ramírez Romero, Patricia; Castillo González, Miguel
Universidad Autonoma Metropolitana
Av. San Rafael Atlixco 186
Col Vicentina, Del. Iztapalapa, CP 09340, D. F. México
+52 0155 5558044747 Fax: +52 0155 5558044738
edch@xanum.uam.mx

The Environmental Breach evaluates the impacts of development projects in an objective integral and cumulative way. It also predicts the net effect through time, incorporating the results of the mitigation measures and potential residual impacts. This study presents its application in the impact assessment of four oil industry projects (sismologic prospecting, wells, terrestrial ducts and production infrastructure) in Mexico's nor oriental region, modeled with seven variables and in three time intervals (5, 10 and 15 years). Nowadays, this region suffers the reconversion of land use, a demand for potable and irrigation water, agricultural substitution for grazing land, vegetation, fauna and habitat degradation and the production of energetic depends on the international market. Results showed cumulative and residual impacts, with positive effects on commerce (32.7%), and negative effects on fauna (12.6 %), habitat (21.7 %), hydrology (11.3 %), soil (20.7 %), land use (9 %) and vegetation (14.4 %). At the end of the 15 years simulation, an environmental active was obtained for commerce and environmental passives for fauna, vegetation, land use and habitat; also, incipient effects were found on soil and hydrology. The projects were hierarchized according to their descendent degree of potential damage: terrestrial ducts, production infrastructure, wells and seismologic prospecting. The Environmental Breach associated the worst effects, synergic, regional, permanent and of highest magnitude with large lineal projects that cause habitat removal and fragmentation, where related attributes, like soil and hydrology, partially assimilate and compensate the negative effects. On the other hand, those activities of short duration, punctual, reversible, that generate a minor pressure on environmental factors with a higher recovery potential like vegetation, were grouped together. With these results, it was possible to prioritize mitigation measures on the most affected attributes, concentrating the resources on habitat protection.

Key words: *Environmental Breach, recovery potential, habitat protection*

THE ENVIRONMENTAL BREACH, A TOOL FOR THE EVALUATION OF CUMULATIVE AND RESIDUAL ENVIRONMENTAL IMPACTS (poster)

Ducoing Chahó, Edmundo; Silva Torres, Beatriz; Ramírez Romero, Patricia; Castillo González, Miguel
Universidad Autonoma Metropolitana

Av. San Rafael Atlixco 186
Col Vicentina, Del. Iztapalapa, CP 09340, D. F. México
+52 0155 5558044747 Fax+52 0155 5558044738
edch@xanum.uam.mx

To evaluate and ponder cumulative environmental impacts derived from development projects, one can take advantage of scenery modeling tools, at different time intervals, like KSIM. In these simulations, the results of the first period are used to model the second time interval and so on. In each modeling, the work group analyzes the behavior of the variables and their integration into the simulated system. If the resulting model is not satisfactory, the values are modified and the procedure is repeated until a consistent behavior with reality is obtained. This process is applied to three sceneries: without project, with project and with mitigation measures. Later on, to analyze and integrate the cumulative and residual impacts, we propose the use of the Environmental Breach, which is the comparison between the values, in thousandths, of the environmental quality of each factor in all of the previous sceneries. The Environmental Breach can be classified in three categories, in accordance with the degree of modification: definitive (> 10%), moderated (5-9%) and incipient (<5%). In conclusion, the Environmental Breach provides an objective valuing of the collection of interactions and modifications derived from the activities on the environmental factors and allows the prediction of the net impact of the project along the time, under different situations. In addition, it categorizes the activities and environmental attributes in accordance with their potential for damage, recognizes the pertinence and efficacy of the mitigation measures and identifies the existence of potential residual impacts.

Key words: *KSIM, Evironmental Breach, potential residual impacts*

TECHNIQUES FOR EFFICIENT IMPLEMENTATION OF PUBLIC PARTICIPATION IN ENVIRONMENTAL ASSESSMENTS (poster)

Norejko, Monica
42 Roehampton Cres. , Guelph, ON N1L 1M8 Canada
+1 519 837 3179

Public involvement is a feature of Environmental Impact Assessment (EIA) and can lead to better and more acceptable decision-making. It can be time consuming and demanding, yet without it, proposals are less likely to be soundly based, and are more likely to be subject to antagonism from affected people. Public involvement, undertaken in a positive manner and supported by a real desire to use the information gained to improve a proposal, will generally lead to better outcomes, and provide a foundation for ongoing positive relationships between the participants. The objectives of this poster are to discuss the stages of environmental assessment where public consultation (PC) should occur, the factors for its effective implementation, the potential constraints, common criticisms and conflict management. Specific tools from the Worldbank Participation Sourcebook will be summarized. Obtaining trust from public is an important process to inform the public of all issues concerned. Often local people have a negative impression of outside experts, whether they come from the private or public sector, which needs to be acknowledged. Engaging stakeholders in repeated interactions, and working through intermediaries who have on-going relationships of trust with poor and vulnerable groups, helps to build trust, and gain the participation of affected stakeholders. Good intentions alone will not ensure effective public involvement. To maximize the effectiveness of consultation, the consultation program (CP) must be carefully planned, and integrated with the various stages of the EIA process. The design of the CP must cater for local constraints, which may affect the delivery of the program. The range of criticisms of consultation will be addressed so those carrying out consultation can be made familiar with them to address and ultimately overcome them. The basis for the information provided will be supported with a variety of case studies throughout the world.

Key words: *consultation, EIA, public, public participation, stakeholders*

WHEN HALF A METRE REALLY MATTERS: DAMMING THE NILE IN UPPER EGYPT (poster)

Ramsay, James
J. Ramsay Associates
2671 Margate Avenue, Victoria, BC V8S 3A8 Canada
+1 250 598 4415 Fax: +1 250 598 4450
jramsay@horizon.bc.ca

The New Naga Hammadi Barrage and Hydropower Plant is under construction to replace an existing barrage across the Nile in Upper Egypt. The project was designed during the 1990s. The independent Panel of Experts set up to review the design process played a key role in promoting, firstly, an IEE, and secondly, an EIA, to meet both new Egyptian EIA requirements and international funding agency expectations. The EIA findings, especially from extensive groundwater modeling, were instrumental in a decision to limit the new headpond level in the Nile to 0.5 m above recent summer maxima. Higher headpond levels would give hydropower benefits but would have caused an unacceptable rise in groundwater over a very large area. The project was approved and financed subject to extensive environmental conditionality relating in particular to land acquisition, urban and rural sanitation, environmental monitoring, and adequate environmental staffing and resourcing. Two major mitigation measures, land drainage improvement and rural sanitation, have been established as parallel internationally-financed projects. An extended pre-construction phase from 1999 to 2002 allowed the responsible ministry to develop and implement new procedures for compulsory land acquisition based on market pricing and up-front payments; the national land law is now being reviewed in the light of the success of these measures. Social, health, fisheries, water quality and soils baselines have been established. Construction began in 2002 and will continue until 2007. Environmental

management during construction is focused on avoiding water pollution and soil contamination, upgrading health and safety practices, minimising disruption to local residents, capacity building, and establishing institutional links to implement social programmes and respond to the post-construction situation when groundwater levels are expected to rise in some areas. Technical assistance has been important in supporting these initiatives, which are already influencing the design of other major projects on the Nile.

Key words: *EIA, HIA, SIA, EMP, resettlement, sustainable agriculture, fisheries, participation, capacity building*

DEFINING SIGNIFICANCE WHEN MANAGING ENVIRONMENTAL IMPACTS: A CASE STUDY OF THE BRITISH MINISTRY OF DEFENCE (poster)

Benson, Wendy
Oxford Brookes University
Gypsy Lane Headington
Oxford, Oxfordshire OX3 0BP UK
+44 01865 483448 Fax: +44(0)1865 483559
wlbenson@brookes.ac.uk
www.brookes.ac.uk/iau

Wood, Graham
Oxford Brookes University
+44 01865 483942 Fax: +44(0)1865 483559
gjwood@brookes.ac.uk

Miller, Anne
Oxford Brookes University
+44 01865 483244 Fax: +44(0)1865 483242
amiller@brookes.ac.uk

There have been a number of recent initiatives to incorporate sustainability into the routine processes of government in the UK, which have impacted upon the way in which the British Ministry of Defence (MOD) deals with environmental protection issues. Coupled with new environmental legislation, these have put considerable pressure on military budgets to ensure compliance and management of their impacts upon the environment. The MOD has developed a variety of approaches and tools to manage their environmental impacts, two of which are the introduction of environmental management systems (EMS) to military bases, and the development of a sustainability appraisal (SA) process. Common to both of these processes is the need to identify when an impact upon the environment is or will be 'significant.' As a concept, the assessment of environmental significance is at the core of all discretionary decision-making and is central to all of the tools, processes and all legislative and regulatory systems used in environmental assessment. Attempts have been made within the literature to refine the definition of significance in relation to environmental impacts; however, there is still no accepted method for identifying significance. This paper reports a critical examination of the process of significance evaluation as undertaken in different parts of the British MOD, particularly when employed in the implementation of EMS and SA. Issues of cultural and procedural differences will be discussed, and a comparison made of the problems encountered in each of the two systems.

THE UTILIZATION OF GEOTHERMAL ENERGY AND NATURE CONSERVATION IN ICELAND (poster)

Arnason, Olafur
The Environment and Food Agency of Iceland
Sudurlandsbraut 24, Reykjavík 105 Iceland
+356 591 2000 Fax: + 354 591 2010
olafura@ust.is • www.ust.is

Iceland is among the most active volcanic areas in the world. Geothermal areas are confined to the active volcanic zone that stretches through the country. Because of their unique landscape character, vegetation and aesthetic and recreational value, many of these sites are of considerable conservation interest, both nationally and internationally. However, geothermal energy provides over half of the primary energy supply in Iceland. The primary use of geothermal energy is for house heating but the production of electricity has been increasing and is estimated to grow even further in the near future. In light of the conservation status of many geothermal areas, their exploitation for energy production has been much debated, since it is clear that their utilization will influence their conservation value. In Iceland, geothermal power plants are subject to an Environmental Impact Assessment and the drilling of exploration wells, to model the capacity of geothermal sites, are subject to screening. However, the necessity of appraising the environmental impacts of geothermal energy production sooner in the decision making process has been argued. Because of the conservation value of geothermal sites, and the fact that any exploration may lead to their degradation, a decision has to be made on which sites to leave untouched and which to develope. This decision has to be made before assessing the impacts of exploration drilling of particular sites on the project level. A master plan on the utilization of hydro and geothermal resources in Iceland, which has recently been published, and the European directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment, which Iceland will have to implement by July 2004, may provide a forum for this discussion and ensure the consideration of nature conservation in the future planning of this energy source.

Key words: *geothermal energy, nature conservation, SEA, EIA*

ENERGY INTENSIVE INDUSTRY AND ELECTRICITY PRODUCTION IN ICELAND—EFFECTS ON NATURE AND TOURISM (poster)

Fridriksdottir, Sigurros
Environment and Food Agency of Iceland
Sudurlandsbraut 24
Reykjavik IS-108 Iceland
+354 591 2000 Fax: +354 591 2020
sigurros@ust.is • www.ust.is

The electricity consumption in Iceland has doubled in only 15 years, mostly due to an increase in the aluminum industry. This trend is likely to continue as further power-intensive industrial development is underway. In 2010, the production of aluminum may have quadrupled if all approved projects will go ahead, with the subsequent increase of the emission of green house gases. However, it has been argued that the construction of aluminum smelters in Iceland will in effect decrease pollution from the industry globally, since the electricity production in Iceland does not involve an increase in the emission of green house gases. The generation of electricity in Iceland is derived from hydropower and geothermal power plants, with hydropower plants constituting 80% of the electricity production. The two latest hydro projects, both affecting the highlands of Iceland and both designated to meet electricity needs of aluminum smelters, have caused great controversy. In fact, there has been a heated debate whether large areas of the highlands should be designated as national parks or whether emphasis should be made on using the energy of rivers in those areas for further developments in heavy industry. Areas suitable for dams and reservoirs have also, in many cases, conservation values because of habitats, geological features and/or landscape. According to studies, the wild natural environment of Iceland is the main attraction for the majority of foreign tourists. The debate concerning the highlands has also centered on whether hydro projects will affect tourism in Iceland. A theory has been put forward that the profit from tourism would be 1/4 less than it is today if not for the highlands of Iceland. So far, the environmental impact of aluminum smelters, power plants and power lines has been assessed separately in environmental statements but not their accumulated effect.

Key words: *hydropower, aluminum industry, greenhouse gas emissions, nature conservation, tourism*

AN IMPACT ASSESSMENT: THE EFFECTS OF TREATED MINE WASTE WATER ON FOREST INVERTEBRATES (poster)

Davidge, Douglas
Environment Canada
91782 Alaska Highway
Whitehorse, Yukon Y1A 5B7 Canada
+1 867 667 3409 Fax: +1 867 667 7962
doug.davidge@ec.gc.ca

Lowry, Nathalie
Environment Canada
+1 867 667 3405 Fax: +1 867 667 7962
nathalie.lowry@ec.gc.ca

Godin, Benoit
Environment Canada
+1 867 667 3402 Fax: +1 867 667 7962
benoit.godin@ec.gc.ca

The Brewery Creek hard rock gold mine is located in the North central region of Yukon, Canada. It operated between 1996 and 2002 using cyanide to extract gold from a heap leach operation in a full water recycle system. The mine property is currently in the final decommissioning and reclamation phase, and needs to discharge surplus waters. The discharge water has levels of ammonia toxic to fish and high levels of selenium (Se), which prevents discharge directly to surface waters. Environment Canada, in partnership with the Tr'on Dëk Hwëch'in First Nation, agreed there was a need to investigate the effects of this discharge on the receiving environment. As a result of this partnership, an environmental impact assessment study was conducted on the release of the treated mine waste water to a natural forested area. The changes in the forest invertebrate community, specifically Coleopterans and Arachnids, were evaluated over a two-year period. Multiple invertebrate samples were collected over the spring/summer in 2002 and 2003 from traps located in the land application area and in a control area. In both years changes in numbers of both Coleopterans and Arachnids between the application area and the control were minimal. Where differences were detected, Coleopteran numbers were higher in the land application area whereas Arachnid numbers were higher in the control area. Comparisons between the aggregate number of Coleopterans and Arachnids in 2002 and 2003 showed a higher number of Arachnids in the land application area in 2003. Overall it appears that most changes are happening in the Arachnid community however a difference was detected before spraying started (in 2002) therefore more data is needed to determine whether or not there is a trend. The Coleopteran community appears to be enduring the land application process quite well.

Key words: *mining, waste water, northern Canada, invertebrates, selenium, boreal forest, Yukon*

LOOKING BEYOND THE EIA (poster)

Wen, Marc
Rescan Environmental Services Ltd.
Sixth Floor, 1111 West Hastings Street
Vancouver, B.C. V6E 2J3 Canada
+1 604 689 9460 Fax: +1 604 687 4277
mwen@rescan.com
www.rescan.com

Landry, Francois; Breckenridge, Elizabeth; Pelletier, Clem
Rescan Environmental Services
Sixth Floor, 1111 West Hastings Street
Vancouver, BC V6E 2J3 Canada
+1 604 689 9460 Fax: +1 604 687 4277
flandry@rescan.com
ebreckenridge@rescan.com
cpelletier@rescan.com
www.rescan.com

The typical Environmental Impact Assessment (EIA) uses the proposed design of a project and relevant baseline data to predict potentially harmful biophysical and social consequences. Once identified, these negative consequences can be eliminated or mitigated by modifying the project

design. The objective of an EIA is to provide environmentally and socially sound development plans. The comprehensive EIA however, goes far beyond identification and mitigation of social and environmental effects. The comprehensive EIA is multidisciplinary, taking into account the complex nature of modern project design, social, cultural, economic, environmental and regulatory factors. It looks beyond the proposed project to integrate past, present and future aspects of all aforementioned factors, while incorporating the needs and demands of all stakeholders. Stakeholders may include project proponents, government, general public, consultants, Aboriginal / First Nations, and non-governmental organizations. Furthermore it is implemented as early on in the project cycle as possible and continues to operate after the project has concluded. We present a number of case studies that look beyond the EIA document. These case studies demonstrate the value of integrating the EIA process with early community consultation and involvement, forward thinking baseline study designs, effective mitigation strategies, robust effects evaluation tools, and early contribution to project design and closure planning.

Key words: *EIA, comprehensive, multidisciplinary, stakeholders, consultation, mitigation, tools*

THE DESIGN MANUAL FOR ROADS AND BRIDGES: MODERNISING EA (poster)

Kerwick-Chrisp, Dean
Highways Agency
Heron House 49-53 Goldington Road
Bedford, Bedfordshire MK40 3LL UK
+44(0)1234 796080 Fax: +44(0)1234 796155
kerwiad@highways.gsi.gov.uk

Chisholm, Amanda
TRDCD
Victoria Quays, Edinburgh EH6 6QQ UK
+44(0)131 244 7225 Fax: +44(0)131 244 7228
amanda.chisholm@scotland.gsi.gov.uk

The Design Manual for Roads and Bridges (DMRB) Volume 11 provides guidance on environmental assessment requirements for national highway schemes in the UK, combining procedural and technical advice. DMRB Volume 11 was first published in June 1993 with changes in August 1994. Air Quality and Water sections have been revised more recently. Users commended the document and it has had wide and positive application. Volume 11 is the definitive guidance on the environmental assessment of highway projects, but sections of the volume are dated and increasingly risk exposing the national road administrations to challenge. Much has been learned in the ten years of Volume 11's application. At the same time, there have been significant developments in the wider legislative and policy context. These include the introduction of amending EC Directive 97/11 and other European legislation, and the continuing evolution of good EIA practice. The 1990s saw the development of integrated transport project appraisal methodologies across the UK, where environment has equal prominence with safety, economy, accessibility and integration (inter alia the new approach to appraisal and Scottish Transport Appraisal Guidance). Additionally, a greater diversity of project types is now promoted throughout the UK. Accordingly, Volume 11 is being both updated and revised, to re-establish it as the definitive guidance on UK highway environmental assessment consistent with both the business needs of the national road administrations and the requirements of European policy guidance and legislation. The objective of this poster is to outline the emerging direction of Volume 11. The poster will describe the major lessons learned, provide details of the specific issues to be revised and/or updated, consider the developing requirement for flexibility in application and the need for integration with project appraisal, and finally set out brief examples of the range of applications to date.

Key words: *transport, roads, environmental assessment, project appraisal*

THE ROLE OF ENVIRONMENTAL ASSESSMENT AND PUBLIC PARTICIPATION IN INFRASTRUCTURE PROJECTS: THE CITY OF PRINCE GEORGE'S HART WATER SUPPLY IMPROVEMENTS PROJECT (poster)

Gamble, Don; Jones, Christy
Golder Associates Ltd.
Suite 202- 2790 Gladwin Road
Abbotsford BC, V2T 4S8, Canada
+1 604 850 8786 Fax: +1 604 850 8756
dgamble@golder.com
cjones@golder.com
www.golder.com

Sargeant, Nick; Elliott, Nancy; Hendricks, Duncan; Coates, Clinton
Golder Associates Ltd.
Suite 100- 388 First Avenue
Kamloops BC V2C 6W3 Canada
+1 250 828 6116 Fax: +1 250 828 1215
nsargeant@golder.com
nelliott@golder.com
dhendricks@golder.com
ccoates@golder.com
www.golder.com

The City of Prince George is proposing to develop a new groundwater supply and distribution system to service the Hart-Nechako areas. This project will involve construction of a collector well located on Fishtrap Island, within the Lower Nechako River Aquifer, and associated water mains. It will be designed to provide a clean, reliable source of water enabling the replacement of an older conventional well which is potentially vulnerable to contamination from a landfill, while providing emergency backup to other sources serving the southwestern part of the City.

Golder Associates Ltd. was retained by the City of Prince George to prepare an environmental assessment to satisfy regulatory review requirements under the British Columbia

Environmental Assessment Act, and concurrently, under the Canadian Environmental Assessment Act. This environmental assessment provided the basis for formal review and comment by regulatory agencies, First Nations, and the public.

The environmental assessment served as a basis for project planning, design, and implementation to achieve the City's goals and objectives of sustainable resource development and "green infrastructure" principles. The project has been designed and configured to avoid or preclude adverse impacts to local groundwater users, and biophysical and cultural resources.

As part of the environmental assessment process, and on behalf of the City of Prince George, Golder facilitated consultation with the First Nations and other public stakeholders. This process provided information that was readily understandable and accessible, opportunities for public comment and feedback, and a reporting process for documenting how comments received were incorporated into operational and monitoring commitments to be undertaken by the City.

As a result of the outcome of the consultation process, and review by regulatory agencies, the City is anticipating to receive project approvals in spring of 2004.

Key words: *environmental assessment, mitigation, public participation*

ASSESSING THERMAL IMPACTS FROM STEAM ELECTRIC POWER PLANTS (poster)

Friant, Stephen
Golder Associates
6241 NW 23rd St Suite 500, Gainesville, FL 32653 USA
+1 352 336 5600 Fax: +1 352 336 6603
Sfriant@golder.com

Bacher, David
NRG Energy
Indian River Generating Station Box 408
Millsboro, DE 19966 USA
+1 302 934 3525
DBacher@NRGenergy.com

Molzahn, Denise
Jacques Whitford Company, Inc.
450 South Graves Road
Plymouth Meeting, PA 19462 USA
+1 484 322 0301
olzahn@jacqueswhitford.com

Assessing the direct effects of a thermal releases by steam electric power plants on aquatic communities is complex. This complexity is due to the dynamic nature of biological communities, the inherent differences in the thermal tolerance of different species and different life stages, the inherent tolerance of estuarine species to wide range of environmental conditions including temperature, the different types of responses organisms have to thermal stress, the variability derived from measuring and monitoring biological responses, and the effect of other stressors on the thermal tolerance of an organism. Presented will be the results of a study to assess the thermal impacts of the Indian River Generating Station located on the Indian River Bay in southern Delaware, USA. A two-year study was conducted to assess the magnitude, spatial and temporal characteristics of the thermal plume under varying environmental and power plant operating conditions. The potential biological impacts to fish and shellfish populations exposed to elevated temperatures was completed using the EPA Ecological Risk Assessment framework. The process and the results of this analysis will be presented.

Key words: *thermal, power plants, ecological risk assessment*

POWER INTENSIVE INDUSTRY IN ICELAND: HISTORY AND EIA APPROACH (poster)

Einarsson, Haukur; Bjarnason, Rúnar D.; *et al.*
Grensásvegur 1, 108 Reykjavík, Iceland
+354 5104000 Fax: +354 5104001
haukur@honnun.is
rb@honnun.is
www.honnun.is

The first power-intensive industrial company in Iceland was the Icelandic fertilizer plant built in 1954 and is still operating. Landsvirkjun Power Company was established in 1965 on the basis of plans to step up harnessing of hydropower through development of power intensive industries as well as meeting rapidly growing demand from the ordinary market. The ownership of the company is divided among the Icelandic State (50%), city of Reykjavik (45%) and the town of Akureyri (5%).

The first major project of Landsvirkjun was the construction of Burfell Hydropower plant (270 MW) following an agreement made by the Icelandic State and the Alusuisse company on the construction of an aluminum plant in Straumsvik. The plant became operational in 1969. Ten years later, the second power intensive industry plant, Icelandic alloys, became operational, utilizing electrical power from a new hydropower plant from Hauneyjarfoss (210 MW), and the third one was the Icelandic rock wool company (1985). During 1996-2000 three contracts were made on new power-intensive industry projects in Iceland: enlargement of Straumsvik aluminum plant (now Alcan), enlargement of the Icelandic alloys plant and Nordural, a Greenfield aluminum plant at Grundartangi. The most recent project is the construction of a 322,000 tpy Alcoa aluminum plant in East-Iceland utilizing electricity from Karahnjukar hydropower plant (690 MW).

Since the EIA law was implemented in Iceland in 1993 (revised in 2000), Honnun consultants have been in charge of the EIA work for all aluminum plants in Iceland, including monitoring programmes. For that reason the company has

constructed standardized methodology for assessing the main impact of power-intensive industry, mainly aluminum plants. According to the experience, there are several factors that need to be considered in relation to possible environmental impact of an aluminum plant. The main factors relate to air emission from the plant, spent pot lining and effluent discharge. Social effects are also of significant importance.

Key words: *EIA, power intensive industry, EIA experience*

SUSTAINABILITY APPRAISAL OF DISTRICT PLANS IN GHANA (poster)

Nelson, Peter; Azare, C.; Sampong, E.; Yeboah, B.; Darko-Mensah, E.
Land Use Consultants
14, Great George Street, Bristol, BS1 5RH United Kingdom
Nelson_p@bristol.landuse.co.uk
+44 1179 291 997 Fax: +44 1179 291.997

This poster will demonstrate the application of the Sustainability Test to 207 of the 210 District Medium Term Development Plans in Ghana. (A summary of the Sustainability Test was presented as a poster at IAIA 2003, Marrakech.) The Sustainability Test forms the main tool for assessing the extent to which District development policies are in line with environmental, social and economic sustainability principles. Each district has received training in the use of sustainable development principles, and groups of officers have evaluated their own plans. Results have been collated by the national SEA team, (comprising staff of the Environmental Protection Agency (EPA) and National Development Planning Commisssion (NDPC) of Ghana) and supporting consultants.

The findings of the sustainability appraisals will be presented using GIS mapping to illustrate spatial variations in the key issues linking poverty and environment in Ghana. The sustainability appraisals of district plans are being conducted as part of the SEA of the Ghana Poverty Reduction Strategy.

Key words: *strategic environmental assessment, sustainability appraisal, district plans, poverty reduction, sustainability test*

AT THE TIP OF YOUR FINGERS: SEFA, AN INTERNATIONAL EXPOSURE FOR ENVIRONMENTAL FOLLOW-UP STUDIES (poster)

Lavallée, Laurie
Environmental Follow-up Committee
Association québécoise pour l'évaluation d'impacts (AQÉI)
C.P. 785, Succursale Place d'Armes
Montréal, Québec H2Y 3J2 Canada
Phone/Fax: +1 514 990 2193

There has been an expanding awareness, for a number of years, regarding environmental follow-up studies. This is mainly due to the increasing need to improve efficiency and cost-effectiveness of the environmental impact assessment process. As a result of this major concern, AQEI (Association québécoise pour l'évaluation d'impacts) created an on-line database dedicated to environmental follow-up: SEFA* (http://sefa.asp.visard.ca).

This database is now fully operational (in French, in English and Spanish) and all interested stakeholders have free access to it. SEFA's format is user friendly, enabling each user to look up the electronic records without difficulty; 370 reports are listed or available at this time. Users are also thoroughly invited to improve the content by adding, on-line, environmental follow-up reports to the listed records. At the moment, the majority of records listed in SEFA is studies from the eastern part of Canada and these are mostly related to hydroelectric projects. In addition to that, biophysical studies outnumber by far human impacts follow-up reports. For these reasons, contributions from other sources (such as mining, forestry and oil & gas industries or national and internationals institutions) are fundamental in ensuring diversity of topics and data, as much as different experiences or methodologies.

Industries and institutions from all sectors of activity as well as any country would greatly benefit by taking advantage of the unique and public exposure offered by SEFA. This tool therefore opens the way to information flow and promotes knowledge sharing on different environmental aspects of impact assessment throughout the international web of stakeholders. Moreover, it provides international publicity to proponents and consultants who display their studies; this give and take partnership should make it especially interesting for industries and institutions.

*SEFA stands for the acronym Suivi Environnemental, Environmental Follow-up and Seguimento Ambiental and highlights the international span of this initiative.

Key words: *SEFA, AQEI, environmental follow-up, database, data management, tool*

ENHANCING STRATEGIC ENVIRONMENTAL ASSESSMENT IN THE SOUTH AFRICAN WATER INDUSTRY WITH THE USE OF GEOGRAPHIC INFORMATION SYSTEMS AND GEOSTATISTICAL TECHNIQUES (poster)

Steyl, Ilse; Clark, Michael J.
University of Southampton
Highfield Campus University Road
Southampton, Hampshire SO17 1BJ UK
+44 (0)23 8059 2215 Fax: +44 (0)23 8059 3295
i.steyl@soton.ac.uk
m.j.clark@soton.ac.uk
www.geog.soton.ac

The concept of Strategic Environmental Assessment (SEA) has only been used in South Africa since the late 1990s. The approach to SEA followed in the country can be considered to be integrative, where opportunities and constraints

involved in the interactions between the environment and development are considered. The integration of sustainability into the plan or programme also forms an integral part of the approach. It also aims to incorporate the biophysical, social and economic spheres of the environment into an integrated whole. Public participation and stakeholder involvement are also key components in the process. In South Africa, strategic level water management takes place on a Catchment Management Area level scale. Typically these catchments are larger than 12,000 km2. The use of Geographical Information Systems (GIS) can enhance the assessment process to ultimately assist the decision-maker and water manager in their quest for holistic catchment management. In this research GIS was combined with hybrid forms of geostatistical techniques (notably cellular automata and multi-agent systems) to simulate the effect of different water availability scenarios on land use, conservation and socio-economic trends. Water use data was extracted from a water situation assessment model and demographic data from the national census was used. Land use, topographic and other relevant information was acquired from satellite imagery, topographic and topologic maps. The intention with the research was to show how effectively GIS can be used to apply the principles of environmental assessment to decision-making. In using this technique, the visual presentation of scenarios will assist public participation processes as well as those responsible for decision-making within catchment management, thereby raising important question about the selection of appropriate techniques.

Key words: *catchment management, GIS, SEA, water resource management*

SCOPING IN SHELL PETROLEUM DEVELOPMENT COMPANY (SPDC): THE EXPERIENCE WITH THE MAJOR TRUNK LINE REPLACEMENT PROJECT (poster)

Dada, Oritsetimeyin J.; Adoki, Akuro
Shell Petroleum Development Company of Nigeria Limited
Environmental Assessment Department
P.O.Box 263, Port Harcourt, Rivers State, Nigeria
+234 084 4 24039 Fax: +234 084 237127 24756
oti.dada@shell.com
akuro.adoki@shell.com

Umesi, Napoleon O.
Department of Chemical Engineering
University of Port Harcourt
P.M.B. 5323, Port Harcourt, Rivers State, Nigeria
umesi2000@yahoo.com

Scoping is one of the initial steps of the Environmental Impact Assessment (EIA) process that ensures an early engagement of stakeholders in an open and transparent process. It is used to determine the 'scope' of issues and identify those that are significant in relation to the proposed project activities. The benefits of a proper scoping exercise include making the EIA process cost less, involve stakeholders in decision-making, and ensuring effective public participation in the entire EIA process.

The engagement and involvement of key stakeholders is a requirement by the Nigerian EIA regulators at the Federal and State levels. In 2000 Shell Petroleum Development Company (SPDC) initiated steps to improve the EIA process. The aim of the improvement is early engagement and involvement of stakeholders in proposed projects to demonstrate openness and transparency that would ensure that the statutory permit from the regulators is obtained as well as the 'social license' from project communities. Since 2002, numerous scoping exercises were organized in SPDC. One example of these scoping exercises is the series of scoping workshops organized for the proposed major trunk line replacement (MTR) project. The trunk line system of the eastern division of SPDC consists of 3 subsystems the 104 km Nembe Creek Trunk Line (NCTL); the Greater Port Harcourt Swamp Line (GPHSL) 89 km; and the Trans Niger Pipeline (TNP), 274 km. These trunk lines make up the oil evacuation system of SPDC-E. A project has been proposed for the replacement of these lines and approx (200??) communities would be impacted directly or indirectly by this project. In line with SPDCs EIA process manual, scoping of the project was required involving all key stakeholders and was organized over a period of one year. In this paper, a case study of the scoping exercise for the major trunkline replacement project is presented. Methods used in identifying stakeholders, and issues raised during the MTR workshops are discussed. Also, areas for improvement are highlighted

Key words: *scoping, major trunk line replacement, Nembe Creek Trunk Line, Greater Port Harcourt Swamp Line, Trans Niger Pipeline, Shell Petroleum Development Company*

BIOSCENE: SCENARIOS FOR RECONCILING BIODIVERSITY CONSERVATION WITH DECLINING AGRICULTURAL USE IN THE MOUNTAINS OF EUROPE (poster)

Sheate, William; Byron, Helen
Department of Environmental Science and Technology
Environmental Planning and Management Group
Imperial College of Science, Technology and Medicine
Prince Consort Road, London SW3 2BP UK
+44 207 59 49299 Fax: +44 207 59 4933
w.sheate@ic.ac.uk
helen@bigleaf.freeserve.co.uk
www.env.ic.ac.uk/ • www.bioscene.co.uk/index.html

Partidario, Maria Rosario; Bina, Olivia
Fundação da FCT (Department of Environmental Sciences and Engineering Faculty of Sciences and Technology)
Quinta da Torre, 2829-516 Caparica Portugal
+351 21 2949616 Fax: +351 21 2948554
mp@fct.unl.pt
www.fct.unl.pt

The BioScene project aims to investigate the biodiversity and socio-economic implications of agricultural decline and land use restructuring in six upland study regions across Europe

(in Norway, Scotland, Switzerland, Slovakia, France and Greece). Employing an interdisciplinary methodology, BioScene combines an ecological analysis of land-use change and the likely impacts on biodiversity conservation with a series of stakeholder deliberations and sustainability appraisals.

The ecological impacts of agricultural and other land-use changes in each study area are evaluated and correlated with socio-economic history and trends. Using modelling techniques combined with local and other expert knowledge, future habitat and landscape changes are linked to potential impacts on biodiversity. Stakeholder Panels formed in each study area will meet over the course of the project to discuss and compare experiences of landscape change and to debate different landscape futures.

Three scenarios are used to organise thinking about alternative rural futures. Scenario 1 - transferral of traditional agricultural land to alternative land-uses; Scenario 2 - biodiversity conservation; and Scenario 3 - maintenance of small-scale, extensive agriculture in marginal areas. To facilitate assessment of the implications of the three scenarios, a series of possible future landscape mosaics are developed for each study area and will be evaluated by the Stakeholder Panels. In the final phase of the research, sustainability appraisals of the policy and management measures necessary to deliver the goals of each scenario will be conducted.

The project's outputs will include recommendations for the development of the European Biodiversity Strategy, EU agri-environment and rural development policy and their regional variations. BioScene is a 3-year project funded under the EU 5th Framework Energy, Environment and Sustainable Development which commenced in December 2002.

Key words: *biodiversity conservation, mountain areas, scenarios, agricultural decline, rural development, sustainability appraisal*

ADDRESSING HUMAN HEALTH IMPACTS IN EIA: OBSERVATIONS FROM CASE STUDIES FROM NORTHERN CANADA

Noble, Bram; Bronson, Jackie
University of Saskatchewan, Department of Geography
#9 Campus Drive
Saskatoon, Saskatchewan S7N 5A5 Canada
+1 306 966 1899
b.noble@usask.ca
jackiebronson@shaw.ca
www.usask.ca/geography

Consideration of human health impacts in EIA is guided by several pieces of Canadian federal and provincial legislation, including the current Canadian Environmental Assessment Act which defines an 'environmental effect' as including any change that a project may cause in the environment, including any effect of any such change on human health. While there have been a number of proposals to better address human health impacts in EIA, recent research suggests that there is very little agreement on the scope of health issues in EIA and little consistency in assessment approaches. EIA practices vary considerably in Canada. However, given that experience with large scale developments and EIA exercises in Canada's northern regions date back to the 1970s, one would expect to see considerable advances in the nature of and extent to which health impacts are considered in EIA and the lessons derived from experiences being transferred from one case to the next. This paper reviews the experience of EIA in Northern Canada with regard integrating human health considerations. We examine a number of case studies in Canada's northern regions, from the Berger Inquiry which was the first of its kind to consider the impacts of development on the well-being of northern communities and changed the prospect of development in Canada's north, to the more recent Voisey's Bay nickel mine and mill assessment. The objective is to examine whether and in what ways health considerations in EIA have evolved and the nature and scope of health impacts. From these case studies, a number of observations about integrating health impacts into EIA will be drawn in order to provide a basis for learning to advance future practice.

Key words: *northern Canada, human health*

LOCAL AGENDA 21 OF GRAZ CITY: THE DEVELOPMENT OF ITS INDICATORS

Aschemann, Ralf
Austrian Institute for the Development of Environmental Assessment (An !dea)
Elisabethstr. 3/3, 8010, Graz, Austria
+43 (0) 316 / 318198 Fax: +43 / (0)316 / 3846777
office@anidea.at • www.anidea.at

In 1995, the City Council of Graz adopted its Local Agenda 21 (LA 21) including 224 components of a comprehensive action program with actors and timeframes corresponding. To assess this LA 21 and to measure any potential progress towards a more sustainable development of the city 23 sustainability indicators have been introduced, all formulated on a quantitative basis (e.g., proportion of renewable energy sources within the City's energy supply). In 1999 the first evaluation of Graz LA 21 started in combination with the participation of a qualified public. In March 2000 this task has been successfully completed and reported to the public.

The second evaluation is planned for 2005, thus several preparatory works have been introduced for that second assessment. E.g., there is a review process of the scope of the indicators, taking into account the actual development in the sustainability research and discussion. Further, there is an ongoing reform process of the administration of Graz in order to optimize the municipal services in the context of shrinking public budgets.

This paper intends to illustrate the most important activities in the ongoing process of the development of Graz LA 21,

focusing on the future shape of its indicators and the resulting consequences for the sustainable policy of the city within the next decade. Further, the indicators' implications for certain municipal assessment issues (e.g. EIA, SEA, HIA) will be examined.

Key words: *Local Agenda 21, sustainability indicators, evaluation, Austria, Graz*

IS IMPACT ASSESSMENT EFFECTIVE IN INFLUENCING POLICY-MAKERS? AN EVALUATION FRAMEWORK APPLIED TO HIA OF DUTCH NATIONAL HOUSING POLICY

Bekker, Marleen P.M.
Eramsus MC; Room, L4-54
P.O.Box 1738, Rotterdam 3000 DR The Netherlands
+31 010-4088579 Fax: +31 010-4089099
bekker@bmg.eur.nl

Putters, Kim
Centre for Law, Public Administration and Informatisation
Tilburg University, Tilburg, The Netherlands

van der Grinten, Tom E.D.
Institute of Health Policy and Management
Erasmus MC, Rotterdam, The Netherlands

Health Impact Assessment has emerged as a means for public health agencies to influence public policy-makers to make 'healthy' decisions. At the same time, however, a lot of policy-makers question the value added of HIA. Similar, several public health experts in the Netherlands and abroad recognize the difficulties of influencing policy-makers to actually make policies health sensitive. A question prompts: how effective is HIA in raising health impact awareness among policy-makers? To evaluate the effectiveness of HIA, one needs to look beyond the product and procedure of HIA to the policy process as a whole of which the HIA was part. Learning from experience through evaluation has not been practised widely. Our paper will describe a theoretical framework for impact assessment evaluation in general and illustrate this empirically by presenting the preliminary results of a case evaluation of HIA effectiveness at the strategic policy level: Dutch national housing policy. The impact assessment evaluation framework is based on policy analysis literature and knowledge utilization studies. The basic question to be answered is how decision-makers utilize the information from an impact assessment. We distinguish between direct, instrumental utilization; long-term conceptual utilization; and strategic utilization. The explanatory framework for these kinds of utilization is at the actor level and at the institutional level. In our paper and presentation we will apply this framework to the case of Dutch national housing policy. We have analysed documents from different archives and conducted interviews with several policy actors, stakeholders and HIA practitioners at both the strategic and the operational level. The preliminary results draw an astonishing picture of the link between HIA and the policy process in this case, which has both theoretical implications for evaluating HIA effectiveness as well as practical implications for developing conditions for an effective HIA.

Key words: *public decision-making, policy analysis, HIA, effectiveness evaluation*

INCORPORATING HEALTH INDICATORS INTO ENVIRONMENTAL IMPACT ASSESSMENT

Dunn, Carolyn
Environmental Health Assessment Services
Safe Environments Programme
Healthy Environments & Consumer Safety Branch
Health Canada
4th floor, Tupper Bldg. AL 6604M
2720 Riverside Drive, Ottawa, Ontario, K1A 0M2 Canada
+1 613 948 2875 Fax: +1 613 941-8921
carolyn_dunn@hc-sc.gc.ca
www.hc-sc.gc.ca/hecs-sesc/ehas/index.htm

Integrating health into EIA helps to address public concern, minimize adverse effects on humans, maximize beneficial effects, and supports sustainable development. A health impact assessment within an environmental impact assessment aims to determine how a project will affect the health of the communities in question.

Methods and data for undertaking health impact assessment are lacking. This paper outlines a way of assessing the health of communities, using the determinants of health approach. This involves examining how a development project could affect quantitative indicators of the determinants of health. Eight determinants of health are considered: social support networks, employment and working conditions, physical environments, education, healthy child development, health services, personal health practices and coping skills, income and social status.

This paper will outline indicators of health which can give quantitative descriptions of many of these determinants of health. The examples of these indicators, and data used, are from a Statistics Canada online database, and are typical of data available from national censuses and population health surveys. The paper will demonstrate how health indicators can be used in environmental impact assessments, providing case study examples from the baseline data collection done for certain Canadian EIAs.

Key words: *health impact assessment, baseline socio-economic studies, determinants of health, EIA methodology*

U.S. ARMY CORPS OF ENGINEERS PLANNING PROCESS, IMPACT ASSESSMENT CONSIDERATIONS, AND INFLUENCE ON DECISION-MAKING

Fristik, Richard
U.S. Army Corps of Engineers, Institute for Water Resources
7701 Telegraph Road, Casey Building
Alexandria, VA 22191-3868 USA

+1 703 428 8066 Fax: +1 703 428 8435
richard.fristik@usace.army.mil

Orth, Kenneth D.
U.S. Army Corps of Engineers, Institute for Water Resources
+1 703 428 6217 Fax: +1 703 428 8435
kenneth.d.orth@usace.army.mil

Federal water resource development agencies in the United States follow a structured, 6-step process in planning water projects. These steps are: 1) Identify problems and opportunities; 2) Inventory and forecast resource conditions; 3) Formulate alternative plans; 4) Evaluate effects of alternative plans; 5) Compare alternative plans; and, 6) Select a recommended plan. These planning steps are closely paralleled in the implementing provisions of the guiding legislation for environmental protection of federally-influenced development projects, the National Environmental Policy Act (NEPA). This paper will begin with a very brief background description of the Corps of Engineers' structure, function, and missions, and then move on to a description of the agency's planning guidance and a comparison/contrast with the NEPA implementing regulations. A linkage will be established between the two, and then focus will be drawn to the role of impact assessment and its influence on decision-making. Current Corps of Engineers efforts to strengthen impact assessment procedures, and in turn project decision-making, will be described. These include a planning models improvement program, increased emphasis on independent peer review, the institution of a set of Environmental Operating Principals (EOPs), and initial steps to incorporate an environmental management system in agency planning and operations.

Key words: *Corps of Engineers, planning process, impact assessment, NEPA, agency decision-making*

NORMATIVE PRINCIPLES FOR EIA FOLLOW-UP: AN EVALUATION OF THE NWT EKATI DIAMOND MINES PROJECT, CANADA

Macharia, Sarah
University of Saskatchewan
Department of Geography
#9 Campus Drive
Saskatoon, Saskatchewan S7N 5A5 Canada
+1 306 652 2264
sarah.macharia@usask.ca

Noble, Bram
University of Saskatchewan
Department of Geography
+1 306 966 1899
b.noble@usask.ca
www.usask.ca/geography

The need for comprehensive and systematic follow-up programs in EIA is well documented, and there is a considerable volume of literature on follow-up related themes. Given our lengthy history of EIA in Canada, there has been significant opportunity for the development and testing of effective follow-up programs. However, recent research suggests that follow-up programs have not been satisfactorily implemented in practice and, moreover, there has been limited attention given to the principles necessary to develop and implement effective follow-up programs. This paper presents a number of normative principles to improve the design and effectiveness of EIA follow-up programs. The principles are derived based on a review of the follow-up literature, discussions with EA practitioners, and based on recent case study experiences. The principles are then applied to evaluate BHP's Ekati project, Canada's first diamond mine, located in the Lac de Gras area of the Northwest Territories. The project has been identified as a critical assessment in northern EIA that would potentially pave the way for a plethora of mining development projects in the region. For this reason, an evaluation of the Ekati follow-up program is timely, as it will serve to identify potential learning opportunities to improve the design and effectiveness of future follow-up programs in Canada's northern regions.

Key words: *follow-up, normative principles, Ekati Diamond Mine*

IMPROVING PRACTICE IN IMPACT ASSESSMENT — ADDITIONAL FINDINGS FROM THE LEARNING FROM PRACTICE STYLE

Quigley, Robert
Q-Research
4 Krull Street, Wellington, New Zealand
+64 4 389 0897 Fax: +64 4 389 0896
rquigley@xtra.co.nz

Taylor, Lorraine
Health Development Agency
7th Floor Holborn Gate
330 High Holborn, London WC1V 7BA UK
+44 20 7061 3178 Fax: +44 20 7061 3393
lorraine.taylor@hda-online.org.uk.

The Health Development Agency has carried out a series of learning from practice workshops to trial a particular method of translating evidence and knowledge into practice for HIA: the 'learning from practice' approach. This had already been successfully applied to the HDA's work in the field of teenage pregnancy. The concept behind these workshops was informed by a body of evidence about how people learn, and how the ways in which they learn make it more or less likely that they will make actual changes to their practice.

The HDA agreed that each HIA workshop should be planned and delivered to:

- Identify examples of projects that demonstrate aspects of promising practice
- Identify particular elements and processes that need to be in place to make such activities successful

- Actively disseminate and share this learning with those who are in the process of planning and providing similar provision

In addition to achieving these aims, a further aim was to test the Learning from Practice workshop model, and assess its benefits for future application. The HDA therefore commissioned external evaluation to:

- Assess whether the workshop aims and objectives were achieved
- Assess the acceptability and appropriateness of the approach used; from the initial contact with participants through to the delivery on the day
- Evaluate the intended and unintended impacts of the workshops on the attendees work programmes and project work, both planned and completed - at a regional and local level (include networking etc.)
- Identify how the workshop process could be improved
- Determine the usefulness of the resources created.

A presentation at IAIA 2003 highlighted the learning from practice approach used in the workshops, and presented preliminary internal evaluation of the approach. This paper will present the rationale for this external evaluation in more detail, the evaluation aims/objectives and the methods used to collect the data. Findings from the study, outlining the learning that we have gained from externally evaluating this work, and conclusions about how to use this approach for improving HIA practice will be presented.

Key words: *health impact assessment, learning from practice, training, evaluation*

REVIEWING THE QUALITY OF ENVIRONMENTAL IMPACT STATEMENTS: A CASE STUDY ON ROADS CONSTRUCTION IN A SPANISH REGION. PART II

Peris Mora, Eduardo
Catedrático Dep. Ingeniería Construcción y Proyectos
Ingeniería Civil
Universidad Politécnica de Valencia
Camino de Vera s/n 46022 Valencia, Spain
+3496 387 95 64 Fax: +34 96 387 75 69
eperis@cst.upv.es

Velasco, Fernández; Víctor, Luis
Env. Sc.

Development of EU Environmental Impact Assessment Policy has been criticized from the start as a result of doubts arisen on its application and effectiveness. Coming from different fields, academic and institutional, there have been some approaches towards quality design of Environmental Impact Statements. However, very few studies refer to EIA process in all, which includes environmental impact previous studies, preparation of Environmental Impact Statements (EIS), consultation, public involvement, review and decision-making.

In the context of a research issued by Valencia Polytechnic University, a large and representative sample of EIA dossiers concerning road projects already built has been analysed. The main objective of the research, part of a PhD (#) titled proposal to characterise the quality of Environmental Impact Assessment Process, Application to Road Projects, was to establish judgment about quality control of the different EIA process stages. The first part of the research is connected with quality of Environmental Impact Statements and suitability of quality control tools recommended by European Commission, as follows:

1. Characterisation of specific variables of Environmental Impact Statements
2. Characterisation of quality of EIS through application of standard tools on research sample
3. Application of selected tool: Review Checklist (EC, 1994)
4. Design of a brand new tool of EIS quality Characterisation
5. Application of brand new tool
6. Comparative analysis through results from both tools

The three first items' results were discussed at IAIA´03; Environmental Impact Statements quality results were low, although there was a positive evolution throughout the analysed period. The research presented in this paper is related to items 4, 5 and 6. Taking into account potential improvement of standard checklist, a brand new tool was designed and applied on sample.

Key words: *environmental impact statement, quality control methodology assessment*

A REVIEW PACKAGE FOR ASSESSING THE QUALITY OF EIRS IN SOUTH AFRICA (poster)

Sandham, Luke; Pretorius, Helen
School of Environmental Sciences and Development
North West University
Private Bag X6001, Potchefstroom, 2520, South Africa
+27 (0)18 299 1585 Fax: +27 (0)18 299 1580
ggflas@puk.ac.za
twpret@webmail.co.za

van der Walt, Andries
School of Planning and Landscape
University of Manchester, Oxford Road
Manchester M13 9PL United Kingdom
+44 (0)161 275 6887 Fax: +44 (0)161 275 6893
a.j.van-der-walt@stud.man.ac.uk

EIA review is the principle quality control function within any EIA system and can be used as one indication of the effectiveness of the EIA process. EIA became mandatory in South Africa in 1997 with competence of approval shared by

the national Department of Environment Affairs and Tourism (DEAT) and nine provincial environmental departments. Guidance was issued in 1998 by DEAT, but both the regulations and the guidance leave significant scope for interpretation. This has resulted in the evolvement of significant variation in the application of the EIA process in South Africa. This variation in practice poses serious challenges to any assessment of the effectiveness of EIA, hence the need for an instrument to assess EIA quality.

Lee and Colley developed a review package in 1992 to assess the quality of EIA in Europe. This review package has subsequently been adopted and changed. A review package was developed for South Africa by assessing applicability of the Lee and Colley review package for the South African EIA context. The review package was adapted and tested iteratively on a number of EIRs within the North West Province of South Africa until a final review package was derived. The prominence of the scoping phase in South African EIA procedure necessitated significant changes. The final review package was applied to a further sample of EIRs. Results showed that 81% of the EIRs submitted in the North West Province of South Africa are at least satisfactory regarding the regulatory and procedural yardsticks in EIA practice.

Key words: *review of EIA practice in South Africa, EIA review package, EIR quality*

LANDSCAPE ASSESSMENT AS A SOCIAL FOLLOW-UP TOOL AND AN INDICATOR OF SOCIAL ACCEPTABILITY TOWARDS AN INDUSTRIAL PROJECT

Fortin, Marie-José
Groupe de recherche et d'intervention régionales (GRIR)
Université du Québec à Chicoutimi
555, boul. de l'Université
Chicoutimi (Québec) G7H 2B1 Canada
Fax: +1 418 545 5012
marie-jose_fortin@uqac.ca
www.uqac.ca/msiaa

Several outcomes are expected from follow-up activities to improve environmental impact assessment process. To this day, practices are still limited. Regarding social follow-up, rigorous tools are still to be constructed to suit specific contexts and to respond to pragmatic objectives of managers and stakeholders. The aim of this presentation is to propose one such tool based on the concept of landscape.

The tool is based on the premise that landscape is a social and cultural construction. In this manner, landscape is not only what is being seen, but primarily what is being perceived. Perceptions are related to actors and rely on objective dimensions as well as subjective dimensions. By extent, there are as many different potential qualification of landscape as there are actors. In this manner, landscape assessment can be used as an analytical frame to understand the neighbouring relations between promoters and local stakeholders and, also, as an indicator of the level of social acceptability towards an industrial project into a specific region.

The qualitative methodology combines focus groups, slides, content analysis, observation and documentary review. It was designed and tested in the context of a doctoral thesis, part of a multidisciplinary research program conducted at the Université du Québec à Chicoutimi (1997-2002) and based on a case study, namely the settlement of the latest aluminium smelter by the multinational Alcan in the small town of Alma (Canada) (www.uqac.ca/msiaa). The specific case study asked the question: how nearby residents and other territorial promoters assess Alcan's latest smelter? The results show that landscape assessments vary according to the impacts experienced, the context of reference and the life cycle of the project.

Key words*: landscape assessment, social impacts assessment, social follow-up, mega industrial project, aluminum smelter, methodology, sustainable development, environmental justice*

"GOING DUTCH": A QUICK SCAN APPROACH TO EIA FOLLOW-UP

Arts, Jos
Transportation/EIA Centre
Ministry of Transport, Public Works & Water Management
P.O. Box 5044, 2600 GA Delft The Netherlands
+31 15 2518461 Fax: +31 15 2518555
e.j.m.m.arts@dww.rws.minvenw.nl

Nijsten, Roel
Transportation/EIA Centre
Ministry of Transport, Public Works & Water Management
+31 15 2518343 Fax: +31 15 2518555
r.j.m.f.nijsten@dww.rws.minvenw.nl

This paper discusses a pragmatic approach to EIA follow-up that proved to be a useful and cost-effective to several road projects in the Netherlands and that could be of interest to others abroad.

The Dutch Ministry of Transport has developed guidelines for the EIA follow-up of road projects in order to meet the requirements of the Dutch EIA regulations. As follow-up may require a substantial amount of capacity, time, effort and money (both the study and eventual remedial measures) a quick scan analysis has been carried out to investigate what the consequences would be of implementing these guidelines for EIA follow-up.

In this quick scan three road projects that have been recently constructed are evaluated as a pilot:

1. Benelux Corridor in Rotterdam urban area (West NL)
2. A50 Highway Eindhoven-Oss in a more rural area with high nature values (South NL)

3. N34/37 Hoogeveen-Emmen in a rural area (Northeast NL)

This paper first explains the quick scan approach. Important elements are: a strict focus, use of existing information (monitoring), qualitative analysis (use of expert judgement, common sense), use of a workshop process (with practitioners, experts and decision-makers) and a short time-frame (3 months).

Subsequently the results of the EIA follow-up for the cases will be reviewed as well as the lessons learned for EIA follow-up within the Ministry of Transport. Of special importance here is the internal 'policy' toward EIA follow-up and the practicability of the guidance.

Finally, the paper discusses the lessons learnt relevant to practitioners (both within government and industry) around the world. The usefulness of such a pragmatic quick scan approach to EIA follow-up relates to such issues as:

- Procedure - simple stepwise approach, clear division of roles and responsibilities
- Process - quick, cost-effective, open communication between parties, mutual learning
- Content - scoping, 'early warning device' for potential environmental and methodological problems

Key words: *EIA, EIA follow-up, scoping, monitoring, expert judgement, evaluation, quick scan*

SUSTAINING AN IMPORTANT GIFT FROM THE ICE AGE

Conover, Shirley A. M.
7415 McAllister Rd. RR 2
Bewdley, Ontario KOL IEO Canada
+1 905 342 3546 Fax: +1 905 342 2414
aberecl@eagle.ca

The Oak Ridges Moraine is one of the most significant landforms in southern Ontario. Named for its rolling hills and river valleys extending from the Niagara Escarpment to Rice Lake and the Trent River; 160 Kms. It was formed 12,000 years ago by advancing and retreating glaciers.

The Moraine contains the headwaters of 65 river systems (35 in the Greater Toronto Area alone) and has a wide diversity of streams, woodlands, wetlands, kettle lakes, kettle bogs, and significant flora and fauna. It is one of the last remaining continuous green corridors in southern Ontario: still 30% forested and one of the last refuges for forest birds in all southern Ontario.

The Moraine's sands and gravel deposits act as a giant sponge absorbing rain and snow melt. This underground water is then stored through layers of sand and gravel (aquifers), filtered and slowly feleased as cool fresh water to the 65 rivers and streams flowing north to Lakes Simcoe and Scugog, and south into Lake Ontario.

The June 2003 Ontario "Oak Ridges Moraine Conservation Plan" marks a new era of consensus among stakeholders--representatives from environmental groups, the development industry, municipalities, aggregate produces and people with interests in agriculture.

The Plan focuses development in approved settlement areas, preserves agricultural land, and prevents sensitive core and linkage areas from ever being diminished. It includes strong policies for protecting the Moraine's water quality and quantity. It also provides for a continuous recreational trail that is accessible to everyone, including people with disabilities.

Preserving the Moraine is part of the Ontario government's commitment to Smart Growth, a long-term strategy for managing growth in ways that promote vibrant communities, strong economies and healthy environments.

Since the author of this abstract lives on the Oak Ridges Moraine, her paper and maps will focus on Ontario's Oak Ridges Moraine Conservation Plan and responses to it.

Key words: *Oak Ridges Moraine, volunteerism, Oak Ridges Moraine Conservation Plan (Ontario Regulation 140/02), maps: Township of Hamilton official plan, environmentally sensitive, floodplains, natural heritage, natural heritage - provincially significant wetlands, natural core area (Oak Ridges Moraine)), natural linkage area (Oak Ridges Moraine), countryside area (Oak Ridges Moraine)), rural settlement area (Oak Ridges Moraine), mineral aggregate, areas of natural and scientific interest, preservation (examples), Oak Ridges Moraine Foundation, Oak Ridges Moraine Land Trust, Ontario Farmland Trust, Evironment Canada (includes tax breaks), conservation easements, ecological gifts program*

STAKEHOLDERS PARTICIPATION TO ENVIRONMENTAL IMPACT ASSESSMENT AND FOLLOW-UP: A SOURCE OF EMPOWERMENT AND DEVELOPMENT FOR LOCAL COMMUNITY OR AN OTHER WAY TO NEGOTIATE PROJECT ACCEPTANCE?

Côté, Gilles
Groupe de recherche et d'intervention régionales (GRIR)
555, boul. de l'Université
Chicoutimi (Québec) G7H 2B1 Canada
+1 514 274 7797
gilles_cote@uqac.ca

The acceptance of public participation to environmental impact assessment (EIA) and follow-up does not prevent one to examine its actual contribution. Our study analyzes to what extent public participation contributes to the identification and the integration of environmental and social impacts in planning and management of an industrial project, helps in the dialogue between stakeholders, contributes to a

more equitable arbitration of conflicting interests and contributes to a better distribution of power among stakeholders in the sense of providing social control over changes at the local level.

Our approach is in the keeping of the application of the concept of sustainable development and relating notions of empowerment and social capital. The hypothesis of our study is that EIE and relating participation measures promote sustainability by inducing empowerment and the building of social capital at the local level.

In order to verify our hypothesis, we conducted a five years study on an industrial project submitted to the application of the statutory environmental impact assessment procedure of the province of Quebec (Canada). The study which has been conducted in real time throughout the different stages of the EIE, including the follow-up, is based on observations of the application of participation measures, namely the consultation held by the promoter on scooping, the public hearing held by public authorities on the impact assessment report and the creation of two follow-up committees with distinct mandates, one on environmental impacts and one on economic repercussions.

Our study shows that participation did not induce empowerment and the construction of social capital at the local level. On the contrary, participation measures reaffirmed the existing power relations in the community and contributed to the application of social norms which in fact resulted in self-censorship and consensus building, seeking the realization of the project, perceived as essential for the community survival.

Key words: *participation, social impact assessment, follow-up, sustainable development, empowerment, social capital, industrial project, aluminum smelter*

INDUSTRIAL RESPONSES TO THE CLEANER PRODUCTION PROGRAM IN JIANGSU PROVINCE, CHINA

Oliver, Hongyan H.
Civil and Environmental Engineering Department
Stanford University
Terman Engineering Center, Room M-23
Stanford University, Stanford, CA 94305-4020 USA
+1 650 725 8306 Fax: +1 650 725 3164
hyhe@stanford.edu

Ortolano, Leonard
Civil and Environmental Engineering Department
Stanford University
+1 650 723 2937 Fax: +1 650 725 3164
ortolano@stanford.edu

Cleaner Production (CP) is a strategy for companies to reduce pollution and improve resource efficiency. A CP audit is a technique designed to help companies identify waste problems and generate solutions that do not involve treatment. Many countries have made efforts to promote CP, but the outcomes have often been less than satisfying. This paper provides insights into the CP-related behaviors of firms in developing countries by examining the responses of fourteen enterprises to a CP program in Jiangsu Province, China. The program requires selected enterprises to conduct CP audits during one-year periods.

All case study enterprises agreed to conduct CP audits because they wanted to maintain favorable relationships with the agencies implementing the Jiangsu program. Some enterprises completed audit requirements by simply adding the audit to preexisting technology renovation activities. Others used audits to address particular environmental violations. Most enterprises discontinued conducting CP audits when audits were not longer required by Jiangsu Province. Interestingly, some enterprises in the chemical and pharmaceutical sectors had been engaged in CP-related activities long before the government imposed CP audit requirements. These enterprises had adopted CP activities willingly because they felt they could increase profits by making better or cheaper products, and because they faced severe pressure to meet discharge standards. For the fourteen enterprises, profit potential was often the primary criterion influencing CP-related decisions, and pollution reduction was secondary.

CP implementation is particularly challenging because the CP concept represents a process of continuous improvements, and because the high variation across industries makes it impossible to impose uniform, technical standards. Another impediment to institutionalizing CP in China is that end-of-pipe pollution control is deeply entrenched in professional attitudes and in environmental regulatory structures. It is difficult to supplant the prevailing "pollution control culture" without fundamental changes in professional practice and environmental regulations.

Key words: *cleaner production, cleaner production audit, China, Jiangsu, industry, pollution control*

ENVIRONMENTAL ASSESSMENT MAINSTREAMING — PROMOTING AND FACILITATING INVESTMENT, SUSTAINABLE DEVELOPMENT AND COMPLIANCE. (FINDINGS FROM STUDY OF CALIFORNIAN AND GHANAIAN ENVIRONMENTAL LAWS)

Amoyaw-Osei, Yaw
University of California, Davis
International House, 10 College Park Drive
Davis, California 95616 USA
+1 530 757 3446 Fax: +1 530 757 3537
yawosei@ucdavis.edu

There are over twenty institutions and agencies in Ghana, with statutory and oversight responsibility for resource, development and sound planning and management. The scope of responsibilities may be national, regional or local (district) in character, often within elaborate legislative setting. These institutions are, however, often oblivious to

the application and administration of the Environmental Assessment requirements of Ghana. The Environmental Protection Agency of Ghana is regarded perhaps as the one institution concerned with environmental assessment, and expected to respond to all issues related to the environment. This gives the impression, as if the environment is an island divorced from all other sectors, resources and development activities. The passive attitude of the institutions creates a rather non-complementary oversight of functions. The unfortunate consequences include, a host of frustrating and failing administrative regimes that not only suffocate prospective developments and resource management, but also negate the ideals of sustainable development. The paper compares findings from a study of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), of the USA on the one hand, and the Environmental Protection Agency (EPA) Act and the Environmental Assessment Regulations of Ghana on the other. The purpose is to evaluate the strengths and weaknesses of these sets of laws, in so far as sound resource management practices, development / investment promotion, business friendliness, transparency and effectiveness of application of the laws are concerned. The ultimate objective is to propose a mainstreamed environmental assessment system for Ghana, with responsive legal/regulatory, institutional and procedural frameworks for sustainability. This hopefully, could be a model for adoption by other developing countries.

Key words: *CEQA, EPA, NEPA, environmental assessment, mainstream, sustainable development, non-complementary*

CUMULATIVE COMMUNITY IMPACTS OF OFFSHORE OIL AND GAS ACTIVITY IN SOUTHERN LOUISIANA

Austin, Diane
Bureau of Applied Research in Anthropology
University of Arizona
P.O. Box 210030, Tucson, AZ 85721-0030 USA
+1 520 626 3879 Fax: +1 520 621 9608
daustin@u.arizona.edu

Identifying and tracking community impacts of offshore oil and gas activity in the Gulf of Mexico is a daunting task. The sheer size and complexity of the industry is overwhelming. In addition, the impact of a single proposed action - a lease sale - cannot be tracked at the community level. Even when companies holding leases begin to develop them, which may occur years after the actual sale, the impacts of their activities cannot be separated from the impacts of multitudes of other offshore oil and gas activities in the region and beyond. And these cannot be isolated from the effects of many other events and phenomena. Still, the offshore oil and gas industry has left its mark at the local level. The challenge becomes how to document the consequences of this industry in a rigorous way that provides information useful to citizens; their local, state, and national governments; business leaders; social service providers; educators; and the myriad others who must respond to the impacts. This paper describes the use of oral history and ethnography to document social and cultural impacts of more than 50 years of offshore oil and gas industry on social structures and culture in Morgan City, Louisiana.

Key words: *social, cultural, community, cumulative*

FRAMEWORK FOR ANALYSING POLICY INTEGRATION

Nilsson, Måns
Stockholm Environment Institute
Lilla Nygatan 1 Box 2142, Stockholm 10314 Sweden
+46 8 4121415
mans.nilsson@sei.se

Persson, Åsa
Stockholm Environment Institute
+46 8 4121400
asa.persson@sei.se

Environmental policy integration (EPI) has been broadly embraced as a principle in European policy making. Yet what it means in practice is far from clear and its translation from rhetoric to action has shown to be complex and politically difficult. This paper provides a conceptual clarification of EPI based on a review of current research. It then develops an analytical framework for analysing EPI from a policy networks perspective with a set of variables based on existing theoretical and empirical research. In explaining EPI, the analytical framework focuses on policy-making rules and assessment processes as independent variables, but includes background factors such as problem characteristics and the international policy context. One key dynamic that is being addressed is the interaction between the assessments and the policy-making context. The framework is tested in a preliminary study of EPI in energy policy making in Sweden, and some elaborations to the framework are suggested based on the empirical findings. The full paper is published in Journal of Environmental Policy and Planning.

Key words: *policy, assessment, energy, integration*

HOW MANY WIND TURBINES IS A REGION ABLE TO TOLERATE? CONSIDERATION BETWEEN SUPPORTING SUSTAINABILITY OBJECTIVES AND THE ASSESSMENT OF ENVIRONMENTAL EFFECTS

Mayer, Sabine
Federal Environment Agency Ltd. Vienna
Spittelauer Lände 5, Vienna 1090 Austria
+43 1 31304 3311 Fax: +43 1 31304 3700
sabine.mayer@umweltbundesamt.at
www.umweltbundesamt.at

Wind energy is considered a green power technology as it has only minor impacts on the environment. Wind energy plants produce no air pollutants or greenhouse gases. However, any means of energy production impacts the environment in some way, and wind energy is no exception.

This paper attempts to review the fast growing wind energy industry in Austria relating to sustainable development objectives and the effects on the biophysical and the socio-economic environment. Furthermore it will raise the question, whether EIA or SEA are proper instruments to value these impacts. The planning of wind farms in Austria concentrates on very few regions where high productivity can be expected. According to the scope of EIA including an investigation at the project level, it can not provide an adequate overview to measure likely environmental effects of multiple wind farms planned for a single region, even when cumulative effects are comprehensively described. In this regard, the Austrian planning system does not provide for legal site planning at a regional level wherein SEA could become obligatory. Therefore, to provide a better basis for decision-making in valuing impacts of multiple wind farms together, local governments initiated case studies for selected regions. This focused on criteria for site selection, with special consideration of wildlife disturbance and visual impacts. To maintain the balance between supporting wind energy as a clean, renewable and cost-effective energy option for reducing global warming and a critical view on the environmental effects constitutes a challenge for assessing the rapid development of the wind energy sector.

Key words: *wind energy, sustainability objectives, EIA, SEA*

MOVING A STEP FORWARD: THE CONTRIBUTION OF STRATEGIC ENVIRONMENTAL ASSESSMENT TO THE DEVELOPMENT OF HEALTH IMPACT ASSESSMENT IN THAILAND

Nuntavorakarn, Suphakij
Health Systems Research Institute, Thailand
suphakij@hsri.or.th

Sukkumnoed, Decharut
Aalborg University, Denmark
decharut@plan.auc.dk

The development of Health Impact Assessment (HIA) in Thai society has its clear aim for creating Healthy Public Policy. The main framework for HIA development has been developed and applied to various policy and planning processes. At present, there are six Policy Themes that HIA has been working on and around 25 HIA projects have been completed.

In 2001, the reform of the Environmental Impact Assessment (EIA) System was initiated by the Ministry of Natural Resources and Environment. This has led to a number of critical issues for Thai society to be discussed and designed. The impact assessment at strategic level is among the important issues since the existing EIA system is limited to the project level only.

Consequently, the concept of SEA was formally introduced to several stakeholders, who work related to policy process. Since HIA in Thailand has developed to be applied to policy, plan, programme, and project, one important issue at stake is the integration of SEA and HIA, or to put it more precisely, the contribution of SEA to the development of HIA for Healthy Public Policy.

This paper will synthesize the main concept of SEA as well as the experiences of SEA development in selected countries. Then, it will be used to examine the HIA development in Thailand. The main objective is to identify and detail the 'areas' that need more focus in HIA development.

Moreover, the HIA Policy Theme on Industrial and Energy Development will be analyzed in more details and some specific HIA cases will be used to demonstrate the importance, the potential benefits, and the obstacles of applying SEA in Thai context.

Key words: *health impact assessment, strategic environmental assessment, public policy*

WIN-WIN-WIN: THREE CASES SHOW THE "MAGIC" OF GOOD CONSULTATION

Doran, Lee
Ecological Writings # 1, Inc.
2 College Street Suite 218
Toronto, ON, M5G 1K3 Canada
+1 416 934 9503 Fax: +1 416 934 9503
lee.doran@sympatico.ca

This paper summarizes three Canadian case studies that show the benefits of good public consultation during impact assessment. The cases demonstrate that: i) better projects result by ii) understanding the diversity of stakeholder concerns, iii) optimizing projects to accommodate such viewpoints, iv) expediting approvals by pro-actively resolving issues, and v) conserving time and money, overall. The three cases cover a range of geographic scales (local, regional, and territorial) and timeframes (10 months to 30+ years). The first case involves the exploration and development of oil and gas resources in the Mackenzie Valley of the Northwest Territories. It began in the late 1960's and continues to this day. Inter-related activities occur in the Yukon Territory, Nunavut, Alaska, and Alberta. The Berger Commission (Mackenzie Valley Pipeline Inquiry) of the mid-1970's was the defining and definitive event for this case. The second case is the Oak Ridges Moraine, a regionally significant landform/boundary circumscribing much of the Greater Toronto (Ontario) area. It was first recognized as providing regionally significant ecosystem services in the late 1980's and has, recently, been 'protected' as a unit. Over a 15+ year period, a disparate series of public consultations built the public awareness and sensitivity required. The third case is a brownfields site within the City of Toronto that was proposed for re-development from an industrial use (steel bolt manufacture) to residential/commercial uses early in the 21st century. By consulting with local residents at the earliest stages of project planning (before the project design was finalized) and keeping them involved throughout, all necessary project approvals were obtained without controversy or legal challenges within a 10-month period.

Overall, early, sensitive and responsive public consultation enhances the impact assessment process, results in better projects, and optimizes the use of project resources.

Key words: *public consultation, case studies, stakeholder engagement, Canada*

FROM COST TO BENEFIT: CAN SUSTAINABILITY BREATHE NEW LIFE INTO IMPACT ASSESSMENT?

Doran, Lee
Ecological Writings # 1, Inc.
2 College Street Suite 218
Toronto, ON, M5G 1K3 Canada
+1 416 934 9503 Fax: +1 416 934 9503
lee.doran@sympatico.ca

The litany of negative accusations against impact assessment (IA) continues. It is too expensive, it takes too long, it kills too many trees (unnecessarily huge reports), it is too technical and jargon-ridden, it is too bureaucratic, it focuses on the 'wrong' issues, it highlights problems, it neglects solutions, it is too negative...etc, etc. In fairness, some of these accusations have enough substance that they continue to have credibility with many. And of course, the mix of accusations can vary dramatically from jurisdiction to jurisdiction, depending upon each one's specific IA requirements and process. Can anything be done to address these concerns? Is there any hope to bring IA back towards the relevance we all hoped it would have in the beginning? This paper's hypothesis is that the recent return of 'sustainability' offers a unique opportunity to revive IA, as well... to update it and perhaps even streamline it around the core issue of sustainability. Developing the hypothesis, we briefly summarize the origins and history of 'sustainability,' and its current status. We explore whether the recent resuscitation of the sustainability concept is itself sustainable. Particular attention will be focused on whether or not sustainability can be operationalized as a measurement, and therefore, management tool. Finally, we speculate on the future of sustainability assessment, the likelihood of its implementation, and especially, the means available to actually accomplish sustainability goals. Core questions include:

- What should sustainability assessment include?
- Who would/should do it?
- What precedents do we have so far?
- What have we learned from impact assessment that is applicable?
- Is sustainability assessment a practical, useful and sensible 'next step'?

Key words: *sustainability assessment, future of impact assessment*

IMPLEMENTING THE EUROPEAN SEA DIRECTIVE IN GERMAN —BETWEEN "DO-MINIMUM"AND "(PRO-) ACTIVE INITIATIVES

Dalkmann, Holger
Wuppertal Institute for Climate Environment and Energy
Döppersber 19, Wuppertal
North Rhine Westfalia 42103 Germany
+49 0(202) 2492 233 Fax: +49 0(202) 2492-263
holger.dalkmann@wupperinst.org
www.wupperinst.org

The European Directive on Strategic Environmental Assessment should be implemented into national law until July 2004. It still seems questionable, if Germany will meet this deadline. The preparation work is divided between different ministries and the current implementation status varies significantly between the sectors. Furthermore, planning authorities as well as politicians seem to be skeptical about the new opportunities. Generally, a lot more information as well as measures for capacity building are needed, in order to convince the relevant stakeholders and to ensure the effective implementation and use of the instrument. The paper will present the current stage of implementation of the directive in Germany. It will identify the major challenges and answer the question, in which political sectors German ministries are probably going to choose a "minimum-solution" by integrating only the issues directly covered in the EU-Directive and in which sectors politicians and planners are trying to involve some further innovative elements and therefore promote a more creative and progressive way of implementing to reach a sector-specific "optimum". One main focus of the paper will be the German transport planning process. Based on a case study research on the Federal Transport Infrastructure Plan (FTIP) possible opportunities and risks of the implementation of the directive will be discussed. The concluding remarks will outline where the major hints and challenges in Germany are and, considering the German case of implementing the Strategic Environmental Assessment- Directive, which lessons could be learned for other (European) countries. Finally, based on the German experience so far, an outlook for further development of the Directive will be given.

Key words: *SEA, planning process, transport planning, EU-Directive on SEA*

THE EUROPEAN SEA DIRECTIVE: CHANGES IN SPATIAL AND LAND USE PLANNING IN GERMANY

Fischer, Thomas
Department of Civic Design
University of Liverpool
74 Bedford Street South
Liverpool, Merseyside L69 7ZQ, England-UK
+44 151 7943113 Fax: +44 151 7943125
Fischer@liverpool.ac.uk
www.liv.ac.uk/civdes

This paper looks at the likely changes in spatial and land use planning in Germany, following the implementation of the European SEA Directive. It shows that whilst many important SEA elements are already met in current practice, certain shortcomings will remain, as they are not addressed by the Directive. In this context, the importance of formalising SEA at the policy level is particularly stressed.

Key words: *European SEA Directive, spatial and land use planning, Germany*

HEALTHY DECISIONS: THE DEVELOPMENT OF ANALYTICAL FRAMEWORKS IN THAILAND AND THE NETHERLANDS

Bekker, Marleen
Erasmus University, The Netherlands
bekker@bmg.eur.nl

Sukkumnoed, Decharut
Aalborg University, Denmark
decharut@plan.auc.dk

In the past decade HIA has developed as a tool for supporting healthy policy-making. It has been applied as stand-alone exercises or integrated impact assessments to public policy-making at the project and policy level. However, as its impacts on public policy-making have hardly been evaluated before, it remains unclear to what extent HIA actually brings about healthy public policy. This paper aims to combine two theoretical approaches of the relation between HIA and the policy process that have been developed separately in the Netherlands and Thailand. Both approaches focus on policy analysis in order to understand how policy comes about and how HIA may contribute to that process. In addition, both are currently being applied to evaluate policy processes in which a HIA was involved.

Basically, both approaches acknowledge that policy-makers are highly influenced by their institutional and social context, which certainly affects how information, including HIA, would be used in the decision making process. The framework developed by the Thai Health Systems Research Institute focuses on core values of HIA information and the four main components in participating in the public policy process. The Dutch Institute for Health Policy and Management focuses on four possible dimensions of policy-making: cognitive; social; institutional and cultural aspects may shape the way in which policy-makers use HIA. The model assumes that if the policy and the HIA come about in separate arenas it will be very hard to bridge the differences in those four dimensions, thus HIA should be very close to the policy-makers.

There are interesting similarities in these models but also some differences in emphasis that need to be discussed in a broader setting. These involve among other things the different institutional setting of HIA in the Netherlands and Thailand. This suggests that one model for (H)IA cannot be applied in general and in all situations but must be adjusted to local circumstances.

Key words: *health impact assessment, decision making, public policy*

THE QUALITY IN EIA CONCERNING DETAILED DEVELOPMENT PLAN (DDP)

Olausson, Inger
Swedish EIA Centre
P.O. Box 7012
Department of Landscape Planning Ultuna
Uppsala SE-750 07 Sweden
+46 (0)18-67 26 62 Fax: +46 (0)18-67 35 63
inger.olausson@lpul.slu.se
www-mkb.slu.se

Oscarsson, Antoienette
Swedish EIA Centre
+46 (0)18-67 26 42 Fax: +46 (0)18-67 35 63
antoienette.oscarsson@lpul.slu.se

In this Swedish study the quality of Environmental Impact Assessments (EIA) of Detailed Development Plans (DDP) was reviewed. The quality varies strongly and a large number of shortages were identified. Among other things the descriptions of impacts and alternative locations and design were missing or briefly considered. A program for auditing and monitoring is almost non-existing and we found no descriptions of cumulative or indirect impacts. The DDP has a strong legal status and is binding, but the EIA is not. The proposed mitigation measures in the EIAs were seldom transcribed into the DDP document and therefore not binding. The study was carried out by the Swedish EIA Centre and The National Board of Housing, Building and Planning (Boverket), and included about 30 municipalities.

Every year approximately 700 EIAs concerning DDP are made in the Swedish municipalities. There are no strict regulations for EIA in the Planning and Building Act and the municipalities are free to create their own EIA routines. An EIA has to be conducted if the plan permits land use, which might give considerable impact on the environment, but some municipalities have as a policy to conduct an EIA of all DDP without prior screening. The National Board of Housing, Building and Planning recommends an improved screening and scoping process to decrease the numbers and increase the quality of EIA to defend "best practice" in EIA. The size of the municipality is related to the quality of the EIA, but more important to improve the methods of working with EIA issues in the municipality is the commitment of individual officials.

Key words: *EIA, Sweden, quality in EIA, municipality, planning*

THE SIGNIFICANCE OF SOCIAL AND ECONOMIC IMPACTS

Lawrence, David P.
P.O. Station A, Box 3475
Langley, BC V3A 4R8 Canada
+1 604 532 9889 Fax: +1 604 534 9889
lawenv@telus.net

The paper will present an overview of a research study undertaken on the topic of social and economic impact significance. The study was funded by the Canadian Environmental Assessment Agency. The study is intended to help EIA and SIA practitioners determine the significance of social and economic impacts.

The study is divided into three major parts - 1) a conceptual analysis (involving a literature review), 2) an experience-based analysis (based on comments from close to 100 EIA and SIA commentators and practitioners), and 3) a case example analysis (22 examples of significance determination procedures). The major themes addressed in the analysis include - the definition of key terms, social and economic impacts most likely to be significant, approaches for determining the significance of social and economic impacts, links to sustainability, the Precautionary Principle and collaborative EA processes, and status, improvements and residual limitations.

The paper will provide an overview of the study methodology, a summary of the major report findings and implications, recommended conceptual, regulatory and applied improvements, and a listing of the major residual limitations.

Key words: *social, economic, impact, significance*

CRITICAL EXPOSÉ OF LOCAL OWNERSHIP

Varghese, Jeji; Krogman, Naomi
University of Alberta
515 General Services Building
Edmonton, AB T6G 2H1 Canada
+1 780 492 4178 Fax: +1 780 492 0268
jeji@ualberta.net
naomi.krogman@ualberta.ca

Beckley, Tom
University of New Brunswick
P.O. Box 44555, 28 Dineen Drive
Fredericton NB E3B 6C2 Canada
+1 506 453 4917 Fax: +1 506 453 3538
beckley@unb.ca

Nadeau, Solange
Canadian Forest Service
P.O. Box 4000, Regent Street
Fredericton NB E3B 5P7 Canada
+1 506 452 2074 Fax: +1 250 452 3525
sonadeau@nrcan.gc.ca

Numerous theorists have addressed local ownership as a key element in a community's long-term ability to set the pace of its own development and character and assure long-term social benefits from the enterprises that exist in the community's region, in other words community sustainability. Key benefits of local ownership emphasized in the literature include local decision-making, greater capture of material wealth from local resources and empowerment over resource management. Collectively, current resource development literature, including dependency, commons and ecological modernisation literature imply that local control/ownership will lead to community sustainability. In this paper, we examine the validity of this assumption by comparing theorised arguments with empirical outcomes of six local buyout cases and discussing discrepancies, with the goal of refining the discussion related to the literature on local ownership. Local ownership is a more complex concept than many sociologists have considered in the past. For example, the meaning of local ownership varies depending upon the definition, type, extent of ownership, and of the level of control associated with it. Local ownership does not necessarily accompany local control; many factors can limit the control that a local community obtains, such as the constellation of local players in the local ownership structure.

Key words: *local ownership, social impact, resource dependent community*

USING IA AS AN ENVIRONMENTAL RISK MANAGEMENT TOOL IN THE DEVELOPMENT BANK OF SOUTHERN AFRICA

Heydenreich, Cornelia Rosina
5303 Thornton Road N.W
Thorncliffe, Calgary, AB T2K 2B8 Canada
Phone/Fax: +1 403 274 7076
cornelia_heydenreich@hotmail.com

Barlow-Weilbach, Deryl
Development Bank of Southern Africa
PO Box 1234, Halfway House 1685 South Africa
+27 11 313 3049 Fax: +27 11 313 3086
derylw@dbsa.org

The Development Bank of Southern Africa (DBSA) is a development finance institution, the key objective of which is to address socio-economic imbalances and to improve the quality of life of the people of South and southern Africa. The DBSA's core operational activity is providing or arranging finance for infrastructure projects and programmes. Selection, that is, acceptance of a project into the DBSA pipeline, is based on criteria linked to defined organizational objectives and performance areas, operation interpretation and articulation of the Bank's vision and mission.

The DBSA's project appraisal is a key input into informed project selection. Project appraisals are therefore undertaken to firstly provide decision-makers with the necessary information regarding the fit to the three main criteria,

namely development impact, sustainability and additionality. Secondly, to add value where possible on all the dimensions considered during appraisal, which include financial, institutional, economic, environmental, social and technical.

The environmental project appraisal more specifically focuses on three main issues, namely: 1) The environmental impact and risks of the project, 2) legal compliance, and 3) the environmental institutional capacity of the borrower. The overarching purpose of this appraisal is therefore to ensure that projects are environmentally sound and sustainable.

Impact assessments (IA) are one of the main documents that the DBSA not only uses as an information source for the project appraisal, but also to ensure legal compliance. IA furthermore ensures that the environmental risks associated with the project are being addressed throughout the whole life-cycle.

This paper will provide an overview of the DBSA's environmental management approach, the role IA plays within it as well as the lessons learnt regarding the utilization of IA as a risk management tool within a regional development finance institution.

Key words: *Development Bank of Southern Africa, DBSA, environmental impact assessment, EIA, environmental risk*

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) REVIEW OF A HABITAT CONSERVATION PLAN FOR 13 AQUATIC AND TERRESTRIAL SPECIES ON MONTANA STATE TRUST LANDS

Gunther, Pamela
Parametrix, Inc.
5808 Lake Washington Blvd. NE
Kirkland, WA 98005 USA
+1 425 822 8880 Fax: +1 425 889 8808
pgunther@parametrix.com

The Trust Lands Division of the Montana Department of Natural Resources and Conservation (DNRC) has begun the planning process to develop a voluntary habitat conservation plan (HCP) for forest management activities on state trust lands that are habitat for species currently listed or having the potential to be listed under the Endangered Species Act. The HCP is part of the application for obtaining an incidental take permit from the U.S. Fish and Wildlife Service (USFWS). The HCP would address the effects to species from DNRC's forest management activities on 700,000 acres of forested state trust lands in Montana. The incidental take permit would authorize take of federally listed threatened and endangered species in accordance with the Endangered Species Act of 1973 as amended, and other species of concern should they become listed in the future. The incidental take permit would be in effect for 50 years. The DNRC intends to request a Permit for the following species: gray wolf, grizzly bear, bald eagle, Canada lynx, bull trout, wolverine, fisher, northern goshawk, black-backed woodpecker, pileated woodpecker, flamulated owl, westslope cutthroat, and redband trout. The forest management activities that would be covered by the incidental take permit include the following: timber harvest, salvage harvest, thinning, slash disposal, prescribed burning, site preparation, reforestation, weed control, road construction, road maintenance, forest inventory, monitoring, grazing, gravel quarrying, fertilization, electronic facility sites, and other activities common to commercial forest management. Associated with the HCP is an environmental impact statement (EIS) that will address the affects of the proposed incidental take permit on the environment.

Key words: *EIS, habitat conservation plan, threatened and endangered species, forest management activities*

DIFFERENT MEANINGS OF STRATEGIC ENVIRONMENTAL MANAGEMENT

Cherp, Aleg
Environmental Sciences & Policy Department
Central European University
Nador u. 9, Budapest 1051, Hungary
+36 1 327 3089 Fax: +36 1 327 3031
cherpa@ceu.hu • www.ceu.hu/envsci/aleg/

The term Strategic Environmental Management can be used to designate

(1) environmental management undertaken at the strategic level (e.g. by municipal authorities),

(2) a "follow-up" to Strategic Environmental Assessment or

(3) an environmental management tool "transcending" traditional Environmental Management Systems in corporations which seek to incorporate environmental concerns into their core business.

The paper explores conceptual, methodological and operational connection between these three concepts. It shows that in elevating environmental management to the "strategic" level, corporations and public authorities face similar challenges and outlines emerging approaches to deal with these challenges.

Key words: *SEA, integration, strategic environmental management*

SEA AND NATIONAL STRATEGIES FOR SUSTAINABLE DEVELOPMENT

Cherp, Aleg
Environmental Sciences & Policy Department
Central European University
Nador u. 9, Budapest 1051, Hungary.
+36 1 327 3089 Fax: +36 1 327 3031
cherpa@ceu.hu • www.ceu.hu/envsci/aleg/

The post-socialist countries of Central and Eastern Europe have faced radical economic and political systems reforms while delivering on their commitments to sustainable development. In order to implement this combined challenge, the former centralised planning systems should give place to more integrated, participatory and decentralized planning. This paper examines sustainability planning in countries in transition using the principles and criteria for assessing National Strategies for Sustainable Development (NSSDs) developed by the Institute of Development Policy and Management (IDPM) of the University of Manchester.

The criteria are applied to thirteen thematically diverse plans, programmes and strategies from five countries: Belarus, Croatia, Hungary, Slovakia and Ukraine. The reported case-studies suggest that the proposed evaluation approach has a great potential of being used for evaluating and strengthening sustainability planning in different areas and at both national and regional levels though specific adjustments to the generic criteria are, as a rule, necessary to effectively apply them in a particular situation. Most of the evaluated strategies address the pillars of sustainable development using comprehensive and coherent policy process. In countries in transition, there is typically more focus on government ownership than on extensive participation. Subsequently the "agents" of sustainable development are sometimes poorly defined and involved. Integration, identification and resolution of conflicts, finding trade-offs and prioritization remain the weakest elements, likely to be associated with the expert-driven approach to of sustainability planning, while focus on budgeting monitoring and capacity development is emerging.

The paper explores a possibility to use the IDPM or similar criteria as an interactive "quality control tool" for the development of NSSDs.

Key words: *national strategies for sustainable development, assessment, SEA, Eastern Europe*

HUMAN HEALTH CONSIDERATIONS IN THE ENVIRONMENTAL ASSESSMENT OF NUCLEAR FACILITIES IN CANADA

Baweja, Anar
Health Canada
Radiation Protection Bureau
775 Brookfield AL6302D1, Ottawa, ON K1A1C1 Canada
+1 613 941 2355 Fax: +1 613 957 1089
anar_baweja@hc-sc.gc.ca

Tracy, Bliss
Health Canada
Radiation Protection Bureau
+1 613 954 6678 Fax: +1 613 957 1089
bliss_tracy@hc-sc.gc.ca

McClymont Peace, Diane
Health Canada
Environmental Health Assessment Services
Room C490, Tupper Building
2720 Riverside Drive AL6604M
Ottawa, ON K1A 0K9 Canada
+1 613 952 9477 Fax: +1 613 941 8921
diane_mcclymont-peace@hc-sc.gc.ca

Davis, Jeff
Health Canada
Environmental Health Assessment Services
Room C492, Tupper Building
+1 613 948 8297 Fax: +1 613 941 8921
jeff_davis@hc-sc.gc.ca

Nuclear facilities in Canada include uranium mining and milling operations, fuel fabrication facilities, nuclear power and research reactors, and radioactive waste storage and disposal sites. Human health is an important factor in environmental assessments of nuclear projects subject to the Canadian Environmental Assessment Act. The role of Health Canada in these environmental assessments is to provide expert information and knowledge with respect to human health. For this purpose, health is defined as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Health impact assessments consider not only biophysical health, such as exposure to radiation, but also the psychological and social aspects of human health.

Health assessments of nuclear projects are further supported by the Nuclear Safety and Control Act. The Canadian Nuclear Safety Commission enforces regulations under this Act to protect the health and safety of nuclear workers, the general public and the environment. Generally, an environmental assessment must be carried out before a license can be issued by the Commission to operate a nuclear facility.

This paper will describe the process followed to undertake environmental assessments of nuclear projects in Canada, by drawing upon two case histories.

Key words: *health impact assessment, nuclear, uranium mining*

SOCIAL ASSESSMENT OF HYDROELECTICITY DEVELOPMENT IN NEW ZEALAND

Taylor, Nick
Tayor Baines & Associates
75 Oxford Road, Rangiora, North Canterbury, New Zealand
+64 3 313 8458 Fax: +64 3 3138458
n.taylor@tba.co.nz

McClintock, Wayne
Tayor Baines & Associates
37 Stour Dr, Burwood, Christchurch, New Zealand

Fitzgerald, Gerard
Fitzgerald Applied Sociology
40 Puriri St, Riccarton, Christchurch, New Zealand
+64 3 3488923 Fax: +64 3 3488923

Three quarters of New Zealand's electricity demand is provided by renewable resources including generation of electricity throughout the country. However, new projects currently being planned are meeting increasing competition for water resources from irrigation, urban use, tourism, conservation and recreation. There is therefore increasing need for the impact assessment process to contribute to the decision framework with assessments that include social assessments. Most of the benefits from large-scale, capital-intensive hydroelectricity schemes are derived at the regional and national levels, while social impacts are experienced regionally and locally, potentially contributing little to the economic welfare of rural communities in either the short or long term.. Thus the impacts of these projects on neighbouring communities should be projected, mitigated, monitored and managed over the project life cycle at the community, district and regional levels. In particular, the benefits (e.g., additional employment, increased business turnover, better amenities) should be maximised and the costs (e.g., negative environmental effects, social dislocation) minimised. Research from three hydroelectricity projects shows changes in the population and economy of hydro towns involve periods of both rapid growth and rapid decline, as a town moves through phases of the arrival, settlement and the eventual departure of the construction workers and their dependants. Unlike other communities that are economically dependent on a single industry, such as forestry, mining, or tourism, the main workforce impacts of hydro towns are during extended periods of construction. The operation of hydro electric power schemes is highly automated so operational workforces are relatively small, and are not always located at the same site as the construction workers. Social assessments need to focus in particular on workforce characteristics, accommodation requirements and demand for social services.

Key words: *social assessment, hydroelecticity, dams, workforce*

EA PROCESS IN THE NWT UNDER THE MACKENZIE VALLEY RESOURCE MANAGEMENT ACT (MVRMA): A CASE HISTORY, DE BEERS CANADA MINING INC. SNAP LAKE DIAMOND PROJECT

Fratton, Glenda
Gartner Lee Limited
840 7th Ave SW, Suite 1605, Calgary AB T2P 3G2 Canada
+1 403 262 4299 Fax: +1 403 264 8412
gfratton@gartnerlee.com

Morison, Stephen
Gartner Lee Limited
+1 403 262 4299 ext. 120 Fax: +1 403 264 8412
smorison@gartnerlee.com

Ehrlich, Alan
Mackenzie Valley Environmental Impact Review Board
5102-50th Avenue (P.O. Box 938)
Yellowknife NT X1A 2N7 Canada
+1 867 766 7056 Fax: +1 867 766 7074
aehrlich@mveirb.nt.ca

To date, the De Beers Snap Lake Diamond Project is arguably the largest development assessed under Part 5 of the MVRMA. The Mackenzie Valley Environmental Impact Review Board (MVEIRB) administers Part 5 of the MVRMA and is responsible for the conduct of environmental assessments (EAs), which consider environmental, as well as socio-economic impacts. The MVEIRB is an independent board that brings the "northern context" to EA. The MVEIRB's process is transparent to ensure public access to all information generated in support of the EA. The MVEIRB's EA process for the Snap Lake project consisted of developing terms of reference, a conformity analysis, information requests, formal technical sessions, technical reports, pre-hearing conference and a public hearing (the first held by the MVEIRB). This approach aimed at resolving and managing technical issues throughout the process, and developing an understanding of positions between the intervenors and De Beers. EA under the MVEIRB is broad-based, inclusive and considers factors that have not been traditionally considered, such as economic factors. This requires careful management with due consideration for all stakeholders to ensure that the process meets the overall objective of managing environmental and socio-economic impacts with clearly identified mitigative measures. The issue of considering all evidence that is presented through an EA process while at the same time avoiding redundancy with regulatory approvals requires consideration. In addition to this, other instruments such as socio-economic and environmental agreements that are negotiated outside of the formal EA process may have a bearing on EA conclusions.

Key words: *EA process, impact management, Snap Lake, MVRMA*

EFFECTIVE PROJECT BASED CONSULTATION WITH FIRST NATIONS

Meadows, George
Hemmera
1190 Hornby St Suite 350
Vancouver, BC V6Z 2K5 Canada
+1 250 881 0795 Fax: +1 604 669 0430
gmeadows@hemmera.com
www.hemmera.com

The proposed paper will provide an overview of key aspects of engaging First Nations in effective consultation processes within the context of relatively large transportation infrastructure projects subject to the federal and/or the provincial environmental assessment processes within British Columbia. The paper will discuss consultation within the context of recent changes to both the federal and provincial EA processes in British Columbia. These regulatory changes, in combination with the legal and policy changes brought about by recent case law in Haida and Taku will continue to have a fundamental bearing on the conduct of EA in British Columbia for the foreseeable future. These changes to the application of EA within BC also raise several challenges for project proponents and government regulators in meeting

legal/policy obligations to consult with First Nations while at the same time adhering to project priorities, timelines and budgets. This must necessarily be balanced with the very real need to address First Nations needs and interests regarding consultation in a manner that is consistent with the principles set out by the courts and government policy. What this calls for is the establishment of positive working relationships with First Nations that engages them in a substantive way in the project planning, design and review phases of project development. This in turn can raise issues with respect to human resource and financial capacity, and project delivery/approval timelines that present challenges for First Nations, project proponents and government regulators. Within that context, the paper will discuss the following issues: · The basis of the obligation to consult · Implementing consultation within the context of EA generally, and the CEAA and BCEAA more specifically · Consultation Principles or "Best Practices" for engaging First Nations communities in effective project based consultations.

Key words: *First Nations, consultation, environmental assessment*

INTEGRATING IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT: THE VANCOUVER INTERNATIONAL AIRPORT AUTHORITY EXPERIENCE

Robinson, Simon
Vancouver International Airport Authority
Box 23750, Richmond, BC V7B 1Y7 Canada
+1 604 276 1408 Fax: +1 604 276 6699
simon_robinson@yvr.ca

Murray, Anne
Vancouver International Airport Authority
+1 604 276 6357
anne_murray@yvr.ca

Operating a busy international airport in any location is challenging enough. Environmental management at Vancouver International Airport is complicated by its location on an environmentally sensitive coastal estuary and adjacent to a large and growing urban population. The Vancouver International Airport Authority is a private not-for-profit company that operates the Vancouver International Airport under a 60-year lease with the Government of Canada. The Airport Authority has developed a comprehensive environmental management system to ensure the airport is operated in a manner acceptable to the community and protecting the environment. Impact assessment is an important component of the environmental management system. The Airport Authority has conducted voluntary impact assessments of all new construction projects at the airport for over ten years. Impact assessment is a key component of the improvement cycle, integrating new facilities and activities into the ongoing environmental monitoring and management activities. Conversely, the information from these ongoing monitoring programs facilitates efficient and effective impact assessment of new projects. Impact assessment also ensures the airport is developed and operated in an open, and accountable manner. This paper will describe the environmental management system developed by the Airport Authority and focus on the measures taken to ensure the system is open, accountable and effective.

Key words: *environmental management system, impact assessment, airport*

FISHERIES AND ENVIRONMENTAL ISSUES RELATED TO MINI-HYDRO DEVELOPMENTS IN THE MEKONG RIVER BASIN, LAO PDR

Boivin, Thomas
Hatfield Consultants Ltd.
201-1571 Bellevue Avenue
West Vancouver, BC V7V 1A6 Canada
+1 604 926 3261 Fax: +1 604 926 5389
tboivin@hatfieldgroup.com
www.hatfieldgroup.com

Harland, William
Stothert Engineering Ltd.
P.O. Box 10355, 14th Floor
609 Granville St., Vancouver BC V7Y 1G5 Canada
+1 604 681 8165 Fax: +1 604 687 3589
bharland@stothert.com
www.stothert.com

Taylor, Garth
PT Hatfindo Prima
Jl Bango 2-4, Tanah Sareal
Bogor West Java 16161 Indonesia
+62 251 324 487 Fax: +62 251 340 414
gtaylor@hatfieldgroup.com
www.hatfieldgroup.com

Protecting sensitive ecosystems in remote areas of Southeast Asia is extremely challenging, especially given the rapid pace of development in this part of the world. In 2002-2003, an Environmental Assessment (EA) was conducted as part of a proposed mini-hydro development project in Long District, Nam Tha Province, Lao PDR. The main objective was to identify potential environmental impacts, mitigation measures, and develop a comprehensive environmental management plan for a proposed 2 to 10 MW mini-hydroelectric project, and to incorporate these environmental considerations into the engineering feasibility study. Bordered by Thailand, Cambodia, Vietnam, China and Myanmar, landlocked Lao PDR is the poorest and least developed country in Southeast Asia. The proposed Nam Long mini-hydro project is located at tropical latitudes within the 'Golden Triangle Area' in northwest Lao PDR (between approximately 20o 52' to 20o 58' N, and 100o 51' to 101o 09' E). With a population of about 115,000, Nam Tha Province is home to at least forty different ethnic minority groups. The economy is predominantly agriculture, although the fisheries resources of the Mekong River Basin also play a critical role in regional food security. The EA included collection of primary and

secondary data on baseline physical/chemical, biological and socio-economic parameters in Long District, and particularly in the Nam Long Basin, a tributary of the Mekong River system. Key environmental issues related to the project included protection of aquatic and terrestrial resources, and ensuring provision of environmental flows for protection of fisheries habitats. The EA concluded that the socio-economic benefits of this project (provision of stable electricity supply, business opportunities and improved health care) are expected to outweigh the negative impacts (primarily from increased pressure on fisheries and wildlife resources), provided the proposed environmental management and monitoring plans are implemented and enforced.

Key words: *Mekong, Lao PDR, hydroelectricity, fisheries, aquatic, environment*

STRATEGIC IMPACT ASSESSMENTS IN THE ENERGY INDUSTRY: A COMPARISON WITH STRATEGIC ENVIRONMENTAL ASSESSMENT AND SUSTAINABILITY APPRAISAL

De Wit, Monique
Shell International B.V.
PO Box 162, 2501 AN The Hague, The Netherlands
+31 (0)70 377 1808/+ 31 65 252 1108
Fax: + 31 70 377 3797
Monique.deWit@si.shell.com • www.shell.com

Jones, Murray G.
Shell International Limited
Shell Centre, London SE1 7NA, UK
+44 0207 934 5231 Fax +44 0207 934 7348
Murray.G.Jones@shell.com • www.shell.com

Throughout the world energy companies face a complex agenda requiring improved social and environmental performance. Alongside health, safety and environmental (HSE) issues, questions relating to human rights, revenue sharing, biodiversity, ethics, governance, corruption and the social and economic implications of energy activities are rising to the fore. This requires an understanding of the wider social, economic and political context of energy activities. Indeed, social, economic and political factors can play a crucial role in determining whether and at what pace development proceeds; something that traditional ESIA does not always capture given its focus on project-specific issues. The objective of the paper is to outline the purpose and value of high level, strategic impact assessments of the social, cultural, political, economic and environmental impacts of energy projects and to compare it to Strategic Environmental Assessment (SEA) and a Sustainability Appraisal (SA). The focus is on providing examples of the practical application of these assessment techniques.

Key words: *strategic environmental assessment (SEA)), sustainability appraisal (SA), strategic impact assessment*

COMMUNITY PARTICIPATION IN THE EIA PROCESS OF OIL & GAS DEVELOPMENT IN THE NIGERIAN DELTA: CASE STUDIES OF DEVELOPMENT PROJECTS IN BONNY ISLAND

Bristol-Alagbariya, Edward Tamunosiminikarama
Centre for Energy, Petroleum & Mineral Law & Policy (CEPMLP)
Faculty of Law & Accountancy, University of Dundee
DD1 4HN Dundee, Scotland UK
+44 009 44 (0)1283 205894
+44 009 44 (0) 1283 345854
e.t.bristolalagbariya@dundee.ac.uk

The Nigeria LNG Bonny Island Project involved the relocation of a community called Finima in Bonny Kingdom. The protracted effect of that relocation from a people's traditional homeland to another place within their territory and other related problems being encountered by them is very important for the international community to hear. In the same vein, the nature of the challenges on the Finima people within the larger Bonny Kingdom and the involvement of government and attitude of the Nigeria LNG and its sister companies will also be an interesting revelation to make at IAIA 2004.

Key words: *Nigerian Delta (Niger Delta), Bonny Kingdom, BCOT (Bonny Crude Oil Terminal), Nigeria LNG (Nnigeria Liquefied Natural Gas), EIA (Environmental Impact Assessment), public participation, community participation/community consultation, public/objection hearing session, federal regulatory agency (Federal Environmental Protection Agency –FEPA)), project proponent, strategic environmental assessment (SEA), environmental improvement plan (EIP)*

STRATEGIES OF SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL IMPACT ASSESSMENT: A WAY TO FOSTER CORPORATE SOCIAL RESPONSIBILITY? THE CASE OF ALCAN AND NEW SMELTER IMPLEMENTATION (QUEBEC, CANADA)

Gagnon, Christiane
Université du Québec à Chicoutimi (Québec)
555, boul. de l'Université
Chicoutimi (Québec) G7H 2B1 Canada
+1 418 545 5011 p. 5392
Fax: +1 418 545 5012
Christiane_gagnon@uqac.ca • www.uqac.ca/msiaa

Turcotte, Marie-France
Département de Stratégie des Affaires
École des Sciences de la Gestion
Université du Québec à Montréal
C.P. 6192, succ. Centre-Ville
Montréal (Québec) Canada H3C-4R2

What are the links between Corporate Social Responsibility (CSR), Environmental Impact Assessment (EIA) and corporate sustainable development strategies?

There are two opposing views concerning CSR. According to the neo-liberal view, a corporation's only moral responsibility is to promote the financial well-being of its stockholders. A stakeholder is defined as "any group or individual who can affect or is affected by the achievement of an organization's purpose" (Freeman, 1984) and it suggests that relationships with these stakeholders should be managed in an appropriate manner. According to this later theory, as business and society are interconnected, an organization must be responsive to social demands and be able to show a fair level of corporate social performance (Wood, 1991). So, there would be a business case, as well as a normative case, for making a commitment to Corporate Social Responsibility (CSR). On their parts, Wheeler, Colbert and Freeman (2002) have argued that the degree of commitment to CSR and sustainable development will lead to different economic values. According to their model, while organizations with a culture of conformity to regulation and norms will avoid the destruction of economic value, organizations with a culture of relationships management with stakeholders will create value. At the top of the hierarchy in their model, organizations with a culture focused on sustainable development would create the greatest value.

To discuss the links between CSR, EIA and corporate sustainable development strategies, we use a longitudinal case study (www.uqac.ca/msiaa/index.html) related to cycle industrial new project of the biggest producer of aluminum industry (Alma, Alcan). Alcan defined communities and neighbourhood as stakeholders. This multinational put forward a community relationship management program in the phases of planning, implementation and exploitation. Alcan also identified, at the corporate level, sustainable strategies and an ethics code. Therefore, following Wheeler, Colbert and Freeman's model, could we conclude that this kind of corporate management create the greatest value? Do a formal assessment process and participative approach to EIA foster CSR? Could it draw social value? What should be the conditions to create an enhancement of social value not only for the corporate but for the hosted communities of industrial project? That is what the paper points out.

LE RÔLE DE L'ÉVALUATION ENVIRONNEMENTALE STRATÉGIQUE POUR LE NEPAD: ENJEUX ET DÉFIS

Waaub, Jean-Philippe
GEIGER, Université du Québec à Montréal
CP 8888 succ. Centre-Ville
Montréal, QC H3C 3P8 Canada
+1 514 987 3000 8908 Fax: +1 514 987 6784
waaub.jp@uqam.ca
crt.umontreal.ca/~jeanp

Atelier du Secrétariat francophone de l'AIEI: L'évaluation d'impact et le NEPAD: environnement, pauvreté et développement en Afrique

La mise en place du NEPAD offre une opportunité unique pour réaliser une aide au développement conforme aux principes du développement durable. L'aide au développement doit miser davantage sur l'autonomisation plutôt que d'entretenir une forme de gestion de la dépendance. Le point de vue présenté concerne l'apport de l'évaluation environnementale stratégique dans le cadre du financement de nombreux projets de développement qui verront le jour dans le cadre du NEPAD. Ces projets seront bien entendu intégrés dans des programmes sectoriels d'actions, lesquels feront l'objet de coordination et d'intégration au sein des politiques nationales ou sous-régionales. Plusieurs enjeux importants se posent aux décideurs, auxquels les chercheurs devront apporter des réponses, entre autres: la compatibilité des programmes avec les grandes conventions internationales (désertification, biodiversité, changement climatique), les impacts cumulatifs des programmes, les impacts transfrontaliers. Les chercheurs sont interpellés par ces nouveaux défis. Des voies d'actions sont proposées et discutées en insistant sur la nécessité d'adapter autant les processus décisionnels que les méthodes de travail aux consditions culturelles et socio-politiques mais aussi aux moyens humains et financiers. La question du renforcement des capacités est également abordée (quels besoins? quels horizons?). Des liens sont à établir entre les ressources locales disponibles, les réseaux nationaux et sous-régionaux existants et les partenaires internationaux. Quelques exemples de projets de recherche novateurs menés en contexte africain sont présentés à partir des travaux de chercheurs du projet de Chaire de recherche en évaluation environnementale et aide à la décision pour illustrer les bénéfices d'une telle coopération scientifique.

Key words: *NEPAD*

THE EVALUATION OF SIA INDICES FOR DAM PROJECT USING DELPHI TECHNIQUE IN KOREA

Koo, Jakon; Lee, Muchoon
Department of Environmental Engineering
Yonsei University
234, Maeji, Heungeup, Wonju
Gangwondo 220-710 Korea
+82 33 760 2393 Fax: +82 33 760 2394
koo904@chol.com
muchoon@hanmail.net

This study is to practically develop the methodology of social impact assessment (SIA) for dam construction, particularly evaluation indices that can be utilized when dam construction plans are established, and describes the SIA methodology mainly with the results of surveys on 30 experts of environment and water resources using Delphi technique.

The Delphi survey period was about three months from 1 July 2001 to 10 November 2003, and the surveys were answered in 50 to 60% in every three stages.

The result of the Delphi survey shows that it is effective in preventing social conflicts to assess environmental impact in the plan stage such as the long-term dam construction plan

rather than in the policy or project stage, according to experts.

Among assessment indices that should be considered to be important in dam plan and construction, those of the importance of more than 3.5 point in the scale of 5 point at maximum were 10 in the preliminary feasibility study and 19 in EIA. The coefficients of variation (CV) were all less than 0.5 with a stable level.

The index that should be considered to be important in both dam plan and construction is the scale of resettlements. The importance in the preliminary feasibility study is 4.93 (98.6 in the scale of 100 at maximum) and that in EIA is 4.86 (97.2 in the scale of 100 at maximum).

Among 12 assessment elements of policy and economy in the preliminary feasibility study, the element of environment is turned out to be 4.68 in the importance (93.5 in the scale of 100 at maximum), which is the second in the total ranking and the first in the field of policy, indicating that the element is very important in dam construction plan.

Key words: *social impact assessment, dam project, environmental impact, Delphi technique*

EXAMINING THE LINK BETWEEN EMSs AND ENVIRONMENTAL PERFORMANCE: A CASE STUDY OF RIDING MOUNTAIN NATIONAL PARK, CANADA (poster)

Bronson, Jackie; Noble, Bram
Department of Geography
University of Saskatchewan
Saskatoon, Saskatchewan S7N 5A5 Canada
jackie.bronson@ec.gc.ca
b.noble@usask.ca

Once perceived by industry as a financial burden, environmental programs and total quality management are now seen as providing business opportunities and competitive advantages to the industries that adopt such strategies. By implementing an environmental management system (EMS) following ISO 14001 guidelines, an organization is better situated to manage the environmental effects of its operations which, in turn, should lead to better environmental performance. However, research on EMS performance has only recently begun to emerge and the relation between EMSs and genuine improvement in environmental performance has not been clearly established, particularly for organizations such as Parks Canada, whose principle mandate is to protect the natural environment. While EMSs are gaining recognition amongst parks as a systematic approach for dealing with the environmental aspects of park operations, there has been very little investigation as to the effectiveness of EMSs in improving the environmental performance of park operations. This poster presents the results of a case study examination of the effectiveness of Riding Mountain National Park's EMS and its contributions to environmental improvement. The results confirm EMS experience elsewhere in that RMNP's EMS has been only moderately successful at best, and that there exists no clear link between the EMS and environmental improvement of park operations.

Key words: *environmental management systems (EMS) Riding Mountain National Park*

GETTING TO GRIPS WITH SEA GOOD PRACTICE—SELECTED EXPERIENCE WITH METHODS AND PROCEDURE (poster)

Hayashi, Kiichiro
Environment Research Department
Mitsubishi Research Institute
2-3-6, Otemach Chiyoda-ku, Tokyo, Japan
+81 3 3277 0446 Fax: +81 3 3277 0512
maruhaya@mri.co.jp • www.mri.co.jp/E/index.html

Sadler, Barry
EIA Adviser to the United Nations Environmental Programme
1631 Barksdale Drive, Victoria, BC V8N 5A8 Canada
Bsadler01@aol.com

Tomlinson, Paul
Environmental Assessment & Policy
TRL Limited
Old Wokingham Road
Crowthorne RG45 6AG, England UK
+44 1344 770800 Fax: +44 1344 770918
ptomlinson@trl.co.uk • www.trl.co.uk

Verheem, Rob
Commission for Environmental Impact Assessment
Arthur van Schenedelstraat 800, Utrecht, the Netherlands
+31 30 234 7636 Fax:+31 30 233 1295
Rverheem@eia.nl • www.eia.nl

Dusik, Jiri
The Regional Environmental Center for Central and Eastern Europe
Ady Endre ut. 9-11, 2000 Szentendre, Hungary
+420 603 214 487 Fax: +420 377 431 728
jiri.dusik@rec.org • ww.rec.org/EnvironmentalAssessment

In the last decade, development and adoption of SEA has been impressive. Formal provision for SEA has been made by a number of countries, mainly in Europe and North America. The arrangements and procedures of SEA are relatively diverse, although further standardisation may take place when the European Directive on SEA comes into force.

The purpose of this study is to review SEA good practice from a methodological perspective drawing on international experience and selected European examples. The study draws on sixteen cases from the Netherlands, the Central and Eastern Europe and the UK and from many planning sectors, including land use, waste management, drinking water supply, energy and transport plan. The analysis focuses

on the methods and procedures for implementing SEA that are generic to and apply to many or all political/ administrative systems. Step by step guidance is provided on assembly and survey of information, environmental objective setting, establishment of alternatives, scoping, analysis of environmental impacts, evaluation of their significance, identification of mitigation measures, comparison of alternatives, report
preparation, consideration in decision-making, monitoring and follow up and public and third party involvement.

This study was carried out under the supervision and funding of the Ministry of Environment, Government of Japan in order to assist with the development of SEA arrangements and elements of approach that may be integrated within the Japanese planning and decision making system. It was conducted by MRI in
collaboration with international advisors who are listed above.

Key words: *SEA practice, methodology and procedure, European and international experience*

ASSESSMENT OF NOx CONCENTRATION CHANGES AT KIMPO INTERNATIONAL AIRPORT USING EDMS (poster)

Jang, Young-Kee; Cho, Jung-Sik
Dept. of Environmental Engineering
University of Suwon
Bongdam-eup, Hwaseong-si, Kyonggi-do 445-743 Korea
+82 31 220 2147
musim@suwon.ac.kr

Hong, Ji-Hyung
National Institute of Environmental Research
Incheon-si 404-170 Korea

In Korea, the international airport service operated at Kimpo airport was transferred to Incheon international airport in 2001. So the activities of airplane and ground support equipments in Kimpo airport were greatly decreased; the number of LTO (landing and takeoff) cycles was changed from 233,000 to 130,000 in 2001. The emissions from airplane and support equipments were greatly decreased in proportion to these activities changes. In this paper, the predicted NOx value by air quality modeling from Kimpo airport was evaluated with measured NOx concentration of near-by area. EDMS developed by U.S. FAA is used for air quality modeling. This model has been used for emission calculation and assessment of air pollution around airport. NOx value by EDMS was estimated by hourly meteorological data, monthly numbers of LTO cycle and airport operation information. The monthly variations of NOx concentration from airport were calculated by EDMS in 2000 and 2001. The predicted change of NOx due to airplane activities change was compared with the ambient NOx concentration change around the Kimpo airport area during 2 years. About 10 continuous air quality monitoring stations have been operated around Kimpo area, a western area of Seoul. The annual average NOx concentration in western area of Seoul was increased as 2 - 3 ppb during 2 years. On the other hand annual NOx concentration of monitoring site near-by Kimpo airport was decreased as 1.5 - 2.5 ppb in same period. The change of NOx concentration due to decreased airplane activities was found to be significant.

Key words: *air qualty assessment, airport, NOx*

OUTCOMES OF AND LESSONS LEARNED AT THE INFORMATION SESSION ON REGIONAL AND STRATEGIC EA (poster)

Kirstein, Friederike
Environment Canada -Atlantic Region
16th Floor, Queen's Square, 45 Alderney Dr.
Dartmouth, NS, B2Y 2N6 Canada
+1 902 426 8066
friederike.kirstein@ec.gc.ca

Jeffrey, Barry
Environment Canada -Atlantic Region
+ 1 902 426 4633
barry.jeffrey@ec.gc.ca

Several jurisdictions around the world have experience in conducting regional and strategic environmental assessments, especially as they relate to the development of the petroleum industry. In the face of intensifying petroleum activity in Atlantic Canada, the expertise amassed by mature petroleum jurisdictions can be instructive. In May 2003, Environment Canada and the Parks Canada Agency sponsored an information session to learn about the international experience with regional- and strategic environmental assessments, with a focus on the offshore petroleum industry.

The information session illustrated the breadth of international experience with regional-type assessments. It was determined that broad-scale environmental reviews have been conducted in a number of jurisdictions including Brazil, Norway, the UK, and the US. In addition, the session illustrated the numerous benefits of regional-type assessment in tandem with the potential challenges of developing an effective process. The ability of assessments to address cumulative environmental effects; enable broad-scale public participation; and facilitate the upfront identification of sensitive areas was discussed. It was determined that associated benefits can include greater investment certainty for industry; increased efficiencies in the review process at the project-level; and agreement on fair-share approaches to the management of cumulative effects.

In describing regional-type assessment processes as they are applied in seven jurisdictions, differences between process scope, structure, financing and outcomes were observed.

Proceedings of the Information Session have been developed. The proceedings summarize the results of the

Information Session, in tandem with key themes and lessons learned. The document may be of interest to those involved with the IA of petroleum development or with regional IA.

Key words: *regional environmental assessment, strategic environmental assessment, offshore oil and gas, cumulative effects*

QUANTIFIYING HEALTH IMPACT ASSESSMENT - ARMADA MODEL (poster)

McCarthy, Mark
University College London
1-19 Torrington Place , London WC1E 6BT UK
+44 2076791711
m.mccarthy@ucl.ac.uk

Quantified health impact assessment requires knowledge of theoretical causal relationships (risks/benefits) and population exposures. At present, much information is missing. We have developed an operational research model, Armada, which provides estimates of changing population health status. Two examples will be given of its predictive use - for a waste incinerator and for a national policy on vehicle research. The model allows comparison of health effects from different factors, but is limited by available knowledge. Future impact assessment should seek to increase quantitative predictions, to provide objective evidence for decision-makers and to assist choices on mitigation.

Key words: *health model*

REFLECTING ON THE EVOLUTION ENVIRONMENTAL ASSESSMENT

Bina, Olivia
University of Cambridge
Department of Geography
Environment and Society Group
o.c.bina.92@cantab.net

Strategic Environmental Assessment (SEA), deemed a very promising step forward from Environmental Impact Assessment (EIA) in the late 1980s and early 1990s, now appears to have been superseded by a range of new processes and tools, which appear to respond more explicitly to the demand for integration (in its various interpretations) and sustainable development (for example, sustainability appraisals, integrated assessments, sustainability impact assessments). However, it is argued that, before embracing new solutions, we should seek to learn from the experience of three decades of environmental assessment theory and practice, as this can help us understand the nature of the problem that underlies our seemingly endless search for new processes and tools.

During the 1990s, practice was often perceived as moving ahead of theory, identifying problems and seeking solutions which, while pragmatic, have lacked the reflexive characteristic of academic research. In this light, the sometimes confusing proliferation of new instruments and processes seems an inevitable outcome. Practice is providing an important, but potentially partial answer, to a question that seems narrowly framed according to technocratic and rationalist conceptions of assessment. There has been a tendency—also in academic literature—to focus on symptoms (for example, failure to assess alternatives and cumulative impacts), rather than causes: the political and policy-related issues such as the lack of political commitment to, and capacity for, environmental integration, sustainability and strategic planning.

It is time for the theory to learn from practice (as it has done in the last part of 1990s) and to contribute new ideas for the next generation of environmental management instruments. As the two claims: that SEA (and subsequent mechanisms) contributes 1) to improving policy-making and 2) to promoting sustainable development, become central to the literature and practice, the inadequacy of the 'impact assessment mindset' is revealed, and the need for a new theory of assessment, becomes a precondition for the definition of new methods and tools. It is no longer adequate to think of assessment as a means to manage the environment by improving policies, plans and projects: it should be considered as an additional process for managing government systems, and the organisations within them.

Key words: *SEA, assessment, theory, practice*

ASSESSING OPPORTUNITIES FOR HIA IMPLEMENTATION - THE USE OF POLICY ARRANGEMENT ANALYSIS

den Broeder, Lea; Penris, Manon; Put, Gerard Varela
RIVM - National Institute for Public Health and the Environment
PO Box 1, 3720 BA Bilthoven, Netherlands
+31 30 2742735 Fax: +31 30 2744450
Lea.den.Broeder@rivm.nl
www.rivm.nl

Health Impact Assessment is a relatively new public health instrument. It may be perceived as a process approach, aimed at influencing policies, programmes and projects to better address health interests.

An important topic is therefore the question of embedding HIA in administrative and policy processes and structures. Since policy development is a complicated process, a conceptual framework is helpful to analyse the situation.

In a case study in Lithuania, the policy arrangement model developed by Van Tatenhove, Arts and Leroy was utilised to analyse the political and administrative circumstances. This is a multidimensional model including four interrelated dimensions: actors, discourses, resources, and rules. An important feature of this model is the influence of social and political processes on all dimensions.

The model proved useful in understanding the situation and estimating opportunities and barriers for HIA implementation. The focus on processes in policy and society helped to identify a number of important ambivalences. Moreover, a 'hierarchy of dimensions' came forward which provided some direction in overcoming barriers.

However, the policy arrangement model has some disadvantages, too. It disregards an important difference between actors and the other dimensions in the arrangement: the actors are able to consciously influence and change the other dimensions. Secondly, it is less helpful in designing practical recommendations.
These difficulties may be addressed by positioning the actors as the central dimension and by using additional theories or frameworks to increase the model's problem-solving potential.

Key words: *health impact assessment*

LEGAL ISSUES RELATING TO IMPACT ASSESSMENT PROCESSES AND DECISIONS - THE CANADIAN EXPERIENCE

Armstrong, S. Bradley
Lawson Lundell Barristers and Solicitors
1600 Cathedral Place, 925 West Georgia Street
Vancouver, BC V6C 3L2 Canada
+1 604 631 9126 Fax: +1 604 669 1620
barmstrong@lawsonlundell.com

Valiela, Diana
Lawson Lundell Barristers and Solicitors
+1 604 631 6724 Fax: +1 604 669 1620
dvaliela@lawsonlundell.com

This paper will focus on legal issues relating to impact assessment processes and decisions – and in particular, the Canadian experience. The paper will focus on major legal issues which have relevance not only to impact assessment processes in Canada but also other jurisdictions. Some of the major legal issues to be canvassed will include alternative federal and provincial statutory frameworks for environmental and socio-economic impact assessment with a focus on:

- resolving issues of overlapping federal, provincial and territorial and aboriginal government jurisdiction(including joint decision-making processes)
- setting the "triggers" which invoke the statutory decision-making processes
- discretionary powers to identify the "scope" of the project to be assessed
- discretionary authority to determine the scope of "cumulative effects" impact assessment
- careful application of legally defined terms (e.g., "significant environmental impact," "cumulative effects," and "mitigation")
- court review of decision-making - the Canadian experience

In a number of recent decisions, the Canadian courts, both federal and provincial, have considered the scope and extent of judicial review in the context of impact assessment processes. An overview of these cases should provide information and insight not only to those involved in impact assessment processes within Canada, but to those in other jurisdictions.

Some of the key cases (without full citations) include:

- Alberta Wilderness Assn. v. Canada (Minister of Fisheries & Oceans)
- Tsawwassen Indian Band v. Canada (Minister of Finance)
- Labrador Inuit Assn. v. Newfoundland (Minister of Environment & Labour)
- Union of Nova Scotia Indians v. Canada (Attorney General)
- Sunshine Village Corp. v. Superintendent of Banff National Park
- Canadian Arctic Resources Committee Inc. v. Diavik Diamond Mines Inc.
- Cheslatta Carrier Nation v. British Columbia (Project Assessment Director)
- Friends of the West Country Assn. v. Canada (Minister of Fisheries & Oceans)
- Taku River Tlingit First Nation v. Tulsequah Chief Mine Project

Key words: *impact assessment processes, judicial review, cumulative effects, significant environmental impact, mitigation*

HOW HIA IS DONE IN SHELL'S BUSINESS

Birley, Martin
Shell International Health Services
Carel van Bylandtlaan 30
Den Haag 2596 HR The Netherlands
+31 70 377 1693
martin.birley@shell.com

The Shell Group are a large group of semi-autonomous companies covering upstream and downstream operations in the oil and gas industry in over 100 countries. There are health management, sustainable development and social performance policies that require an integrated environmental, social and health impact assessment of new projects. These complement more technical health risk assessments and hazard management systems. HIA is one component of a large and multifaceted set of procedures. The procedures are designed to safeguard and enhance local communities and environments affected by Shell projects. The capacity to manage and implement many of the procedures is well established. HIA is a relatively new area and procedure development may be ahead of methodological development and capacity building. This paper will report on recent experience.

Key words: *health impact assessment, Shell*

AIR QUALITY IMPACT ASSESSMENT METHODOLOGIES FOR THE SEA-TO-SKY HIGHWAY

Schutte, Alex
Environment and Energy Division
Levelton Engineering Ltd.
150-12791 Clarke Place, Richmond, BC Canada
+1 604 278 1411 Fax: +1 604 278 1042
aschutte@levelton.com • www.levelton.com

An environmental impact assessment was conducted for The British Columbia Ministry of Transportation for safety and reliability improvements to the Sea-to-Sky Highway also known as Highway 99, between Horseshoe Bay and Whistler. Construction is planned to occur from 2004-2009, for the 95km project. Since the proposed changes in construction and operation of the highway had a potential to impact the air quality nearby the road way, as part of the EIA, an air quality assessment was conducted. Modeling of proposed future highway emissions was conducted using a hybrid technique of two models - CALINE which designed to estimate the ambient impact from road sources and CALMET which is designed for meteorological modeling. The potential air quality impacts from the construction operations were also modeled and assessed. This is the first time that these techniques have ever been employed for Environmental Impact assessments in BC. A review of the modeling techniques used and assessment of construction impacts resulted in effective recommendations to minimize and mitigate potential impacts and are summarized for this presentation.

Key words: *air quality, Sea-to-Sky highway, impact, transportation*

ASSESSING THE LAND USE IMPACT OF PORT PRIVATIZATION MODELS IN EUROPEAN PORTS AUTHOR INFORMATION

Bowden, Nathan
Delft University of Technology
Jaffalaan 5, Delft Zuid Holland 2600GA
The Netherlands
+31 (0)15 278 8460 Fax: +31 (0)15 278 6439
nathanb@tbm.tudelft.nl
www.tbm.tudelft.nl

De Jong, Martin
Delft University of Technology
+31 (0)15 278 8052 Fax: +31 (0)15 278 6439
w.m.dejong@tbm.tudelft.nl
www.tbm.tudelft.nl

Between Adam Smith and Margaret Thatcher, many positive claims have been made about privatization. Claims included that privatization would stimulate competition, lower costs and raise efficiency. However, opponents of privatization warned that grave consequences would follow privatization. While the battle raged, privatization took place in ports around the world in general and in Europe specifically. Privatization in European ports has taken many forms. This paper assess the impact that these different forms of privatization have had on land use and cost efficiency in the largest container terminals within the largest ports of Europe. First is presented an extensive classification of models of port management and privatization. The largest six ports in Europe are then analyzed using these models, showing how several ports that had been grouped together in the past are actually quite different. Furthermore, models provide points for discussion of the results. Afterwards, in this paper, is investigated if privatization does indeed have a direct and measurable impact on land use and cost efficiency. In order to assess the impact, productive efficiency in container terminals of ports is measured using a Data Envelopment Analysis (DEA) on the eight largest container terminals within the six previously modeled ports. From this is extrapolated the opportunity costs and land use efficiency for all of these terminals for the last 11 years. This more in-depth institutional study reveals a number of remarkable differences that tend to be downplayed in the literature up to now. Firstly, models of public-private partnerships both outperformed their totally privatized models as well as under performed. Secondly, private companies do use land efficiently when properly encouraged to do so. Thirdly, the form that institutional privatization takes is at least as important as the act of privatization itself.

Key words: *ports, privatization, models, property rights, institutions, transport*

DOES LITHUANIAN TRANSPORT POLICY THREATEN NATURAL HABITATS?

Svarpliene, Ausra
Transport and Road Research Institute
I.Kanto 25, LT-3000 Kaunas, P.O. Box 208 Lithuania
+370 370 7 20 25 40 Fax: +370 7 20 56 19
a.svarpliene@tkti.lt

The article analyses conflicts between the development of the trans-European transport network in Lithuania and Europe's network of protected wildlife areas: Natura 2000. In order to guarantee the protection of species and habitats indicated in Birds and Habitats Directives, Lithuania has established some new strict nature reserves and (or) corrected the lines of the present ones. At the moment Lithuania still stands behind the supposed average of the EU state members according to the common area of the protected sites. The average should be not less than 13 % of state land surface. Using EU funds, transport corridors have been developed in Lithuania since 2000. The objective of the development of transport corridors is to meet criteria of EU for the development of road infrastructure, to ensure a fast and effective road communication. The following reconstruction works are planned to be carried out in road corridors: widening of different road sections, pavement

strengthening, repair of bridges, construction of pedestrian and bicycle tracks, implementation of environmental mitigation measures. The development of transport corridors will have affect on the rise of traffic volume, additional pollution, extra parking lots and increase of visitors in NATURA 2000 territories. The reports of assessment of development of transport corridors significantly affecting NATURA 2000 sites are prepared and preventive and protective measures are suggested. The question is whether these preventive and protective measures will ensure the survival of species?

Key words: *transport corridors, Natura 2000, protective measures*

IMPLICATIONS FOR IMPACT ASSESSMENT METHODOLOGY FROM LESSONS OF EXPERIENCE WITH TRIPLE BOTTOM LINE REPORTING BY INDIGENOUS BUSINESS ENTERPRISES

Vemuri, Siva Ram
Charles Darwin Business School
Charles Darwin University
Darwin, NT 0909 Australia
+61 8 89466087 Fax: +61 8 89466777
ram.vemuri@ntu.edu.au

Indigenous Business enterprises are characterized by differences in management practices, leadership styles and decision-making practices, to those of the mainstream. They have been subjected to greater scrutiny than their counterparts when it comes to accountability issues related to the "Triple Bottom Line Reporting." This paper explores the methodological issues related to how impact assessments can be further improved from lessons learnt from the experiences of indigenous business enterprises.

USING A CLASS SCREENING APPROACH TO FACILITATE ENVIRONMENTAL ASSESSMENTS OF PRIVATE SECTOR PROPOSALS IN NATIONAL PARKS IN CANADA

Cumming, Katherine
Parks Canada
145 McDermot Ave., Winnipeg, MB R3B 0R9 Canada
+1 204 984 1929 Fax: +1 204 983 0031
katherine.cumming@pc.gc.ca

Gilson, Neil
Parks Canada
#1300, 635 8th Ave. SW, Calgary, AB T2P 3M3 Canada
+1 403 292 4499 Fax: +1 403 292 4404
neil.gilson@pc.gc.ca

Proponents of projects within national park communities and those involved in the commercial guiding business in national parks are usually from the private sector. Seven small communities are located within national parks in Canada and the construction and maintenance of buildings, roads, and service lines often require environmental assessments. Since 1999, environmental assessments have also been required for the issuance of business licenses authorizing commercial guiding activities. Many private sector proponents are small businesses or private individuals without the expertise or resources to conduct an environmental assessment. The success of implementing a class screening approach to environmental assessment in the Town of Banff has resulted in the development of new class screenings to address the environmental assessment needs of the other park communities and commercial guiding applicants.

The use of class environmental assessments under the Canadian Environmental Assessment Act has resulted in a more predictable and streamlined approach to the environmental assessment of project proposals. The development and application of standardized best management practices ensures that consistent and appropriate mitigation measures are applied to similar projects and businesses. The involvement of proponents in the development and application of a class environmental assessment process helps to increase proponent awareness and understanding of environmental concerns.

A number of challenges were overcome when developing the class screening. A considerable commitment of time and resources was required to complete the initial model class screening report. Appropriate mitigation measures were developed with consideration for the relatively small contribution of commercial guiding operations to environmental impacts in national parks. Forms were developed to facilitate detailed information gathering and easy use by non-professionals. Finally, the cumulative effects of multiple small projects, difficult to address in advance in the model class screening or on an ongoing individual project basis, were addressed through integration with the park management planning processes.

Key words: *protected areas, parks, class screening*

METHODS FOR THE IMPLEMENTATION OF TOTAL WATER POLLUTION MANAGEMENT (TWPM) IN CHUNGNAM PROVINCE, KOREA

Jung, Jong-Gwan; Yi, Sang-Jin
Chungnam Development Institute (CDI)
138-42 Sangdae-dong
Yuseong-gu, Daejeon 305-313 Korea
+82 42 824 7813 Fax: +82 42 824 7817
asset@cdi.re.kr • www.cdi.re.kr

Chungnam Province, located at the heart of Korea, prepared the implementation plan of Total Water Pollution Management (TWPM) for the maintenance of comprehensive water quality in the provincial streams and lakes within the Geum River basin. Currently the management of water quality has been executed on the base of concentration control, so the main targets of monitoring are point sources including domestic sewage, livestock wastewater and industry.

Even though considerable improvements have been achieved in water management policy, it would not be a cost effective means to continue, due to the perspective of carrying capacity of the water bodies. For the preparation of TWPM, it includes current status and prediction of pollution sources and loads, stream quantity and quality, determination of TWPM target to achieve, allocation of the accepted total load by the watershed, description of local residential stakeholder's interests, methods of follow-up monitoring and feedback to improve, and finally a detailed time schedule of TWPM implementation.

The TWPM target will be set to improve water quality in the range of 0.5~5.0 mg/L BOD depending on the streams by the year of 2010, which is much stricter than present criteria.

Key words: *Chungnam Province, TWPM, Geum River Basin, water quality*

WHAT CAN THE HIA FIELD LEARN FROM EVALUATION ACTIVITY IN OTHER IMPACT ASSESSMENT AREAS?

Taylor, Lorraine
Health Development Agency
7th Floor Holborn Gate
330 High Holborn, London WC1V7BA UK
+44 20 7061 3178 Fax: +44 20 7061 3393
lorraine.taylor@had-online.org.uk

Quigley, Robert
Health Development Agency
+44 02 7061 3176 Fax: +44 20 7061 3393
rob.quigley@hda-online.org.uk

The Health Development Agency's HIA work programme for the last two years has focused heavily on the developing evidence base for HIA, in particular thinking about how best to provide support to HIA practitioners in evaluating their HIAs. Without this on-going evaluation activity we will not be in a position to describe and demonstrate what and how HIA is achieving (i.e., the evidence base the HIA).

A number of research studies, evaluation activities and workshops have been undertaken within England over the last few years to help build the HIA evidence base and these have been the focus of presentations at previous IAIA conferences (Taylor & Quigley, 2003 & 2002).

However, there is awareness that evaluation activity in other areas of impact assessment may have something useful to offer the HIA field. It is long recognized that HIA has it origins in other impactassessment areas it therefore may be timely for the HIA field to look again to these origins to see what we can learn. In order to take this forward the Health Development Agency is in the process of commissioning a small-scale research project which aims to identify and capture the developments and learning from evaluation practices in other impact assessment areas.

This paper will present the rationale for this research project in more details, the research aims/objectives and the methods used to collect the data. Preliminary findings from the study will also be presented. Tentative conclusions about what other impact assessment areas may have to offer the HIA field and recommendations for further work in this area will also be highlighted.

Key words: *health impact assessment, evaluation, impact assessment*

APPLYING THE SYSTEMS APPROACH TO SUSTAINABLE TRANSPORT AND MOBILITY

Walker, Warren; Rahmen, Adnan; van Grol, Rik
RAND Europe
Newtonstraat 1
Leiden Zuid Holland, 2333 CP The Netherlands
+31 71 524 51 72 Fax: +31 71 524 51 91
walker@rand.org • www.rand.org

Klautze, Lisa
RAND Europe
Berlin, Germany

Sustainable development requires a balance between (1) the desire for a clean environment and the welfare of future generations and (2) the desire for economic growth and mobility, with concomitant increases in transport demand and use of fossil fuels. Policymakers have to accommodate these conflicting desires by balancing the positive and negative impacts of transport. SUMMA (SUstainable Mobility, policy Measures and Assessment) is a project sponsored by the European Commission (EC). Among the objectives of SUMMA are to define and operationalize the concept of sustainable transport and mobility in terms of its environmental, economic, and social dimensions, and to define a set of outcomes from the transport system that can help policymakers monitor progress towards sustainable transport and mobility. Another objective is to understand how the transport system might respond to external forces, such as new technologies, economic, social, and political developments, and policy changes, so that policymakers can design policies that might lead to sustainability. The approach that we are using on SUMMA—the systems approach—is particularly useful for analyzing problems involving complex systems that are characterized by uncertainty. Although the transport system has been the subject of considerable study, there is still little known about how it might respond to policy changes and changes in other external factors, and how it can be changed in order to lead to more sustainable development. The systems approach helps understanding the interrelationships among the elements of the system and how policies might be designed to steer the system toward sustainability. This paper describes the systems approach and how we defined the transport system in terms of three markets—a movement market, transport market, and traffic market—in which choices are made that influence the final determination of traffic streams.

Key words: *systems approach, sustainability, transportation*

ADOPTING THE GUIDELINES OF THE GLOBAL REPORTING INITIATIVE: WHAT MECHANISMS DETERMINE ITS SPREAD AMONG FIRMS IN DIFFERENT COUNTRIES?

De Jong, Martin
Delft University of Technology
Faculty of Technology, Policy & Management
Jaffalaan 5 2628 BX Delft The Netherlands

Brown, Halina
Clark University
International Development, Community and Environment Program (IDCE)
950 Main Street, Worcester, MA 01610 USA

The Global Reporting Initiative (GRI) is a multi-stakeholder process and independent institution whose mission is to develop and disseminate globally applicable Sustainability Reporting Guidelines. These Guidelines are for voluntary use by organizations for reporting on the economic, environmental, and social dimensions of their activities, products, and services. Since 1999 several hundred companies and institutions worldwide have formally adopted the Guidelines. A traditional approach to assessing their effectiveness—one favored by policy analysts—is to follow the indicators of environmental and social performance by the adopters of the Guidelines. In this paper we take an alternative approach: we look at the process of institutionalization of the GRI by studying the ways in which various societal actors with interest in the GRI data incorporate the practice of corporate disclosure, and the values and norms underlying it, into their operations (both formal rules and informal practices). We (i) examine the ways in which the GRI practices spread across companies, NGOs, financial organizations, government agencies, civil society and other stakeholders; (ii) compare the ways in which institutional practices change according to country-specific context: the US (41 adopters), The Netherlands (13 adopters), Hungary (3 adopters), China (2 adopters) and Japan (62).

Key words: *global reporting initiative, formal adoption, implementation, institutional practices, cross-national comparison, cross-company comparison*

FOOD ISSUES IN ENVIRONMENTAL IMPACT ASSESSMENTS

Boulton, Gordon
Boulton Environmental Risk Assessment Inc.
19 Academy Private, Ottawa, ON K1R 1B6 Canada

Risk assessments of contaminant levels in foods from a human health perspective are an integral part of environmental impact assessments. Country foods (i.e., foods gathered and consumed by residents in the area of the project) can potentially become contaminated due to activities associated with a development project.

A standardized procedure for risk assessment in regard to contaminants in country foods, for use in environmental impact assessments, has been developed. It is anticipated that this assessment procedure will serve to better protect human health and will facilitate reviews of the environmental impact assessments.

This standardized risk assessment involves collecting actual analytical data consisting of the levels of contaminants of potential concern in foods gathered and consumed in the area of the development project. Each project is unique and will require designing and conducting a study specific to the project under review.

It is necessary for each risk assessment to identity contaminants of potential concern, the foods consumed and exposure pathways. Toxicity reference values for the contaminants are required as well as food consumption information.

Post development monitoring of contaminant levels in foods once the project commences is essential. It is suggested that acquiring background levels of contaminants in the foods of concern before the project starts is vital for comparison purposes and to determine the impact of the project activities (after commencement of the project) on the contamination of country foods.

Based on the analytical data collected for contaminant levels in foods for these studies, risk assessments can be undertaken. Recommendations can be provided to protect the health of local residents, based on the results of these risk assessments and the monitoring studies conducted.

THE EIA PROCESS: A CHALLENGE TO DECISION MAKING ENGINEERS

Montañez-Cartaxo, Luis E.
Fderal Commission of Electricity (CFE)
Periférico Sur 4156, 4th floor, 01900-México, D.F. Mexico
+52 (55) 5229 4400, exts. 44100, 44101
Fax: +52 (55) 5229-4400, ext. 44007
lmontanez@cfe.gob.mx

This paper is intended mainly for engineers who are at the upper levels of decision making as managers or leaders of infrastructure and industrial projects.

George F. Sowers was a very well known geotechnical engineer, who in the course of a 50-year professional career investigated the technical causes of several hundred failures (As used in this paper, engineering failure refers to the rupture or collapse of significant parts or all of the project or where operation of the project caused significant damage or injury to others) and became increasingly aware of the purely professional value of failures, showing how our scientific

understanding and technical experience sometimes are distorted or thwarted by our attitudes, customs, and procedures. He evaluated how these human attributes were involved in almost 500 cases of technical failure and published his findings in a technical paper in 1993. Virtually all the case histories he analised involved soil and rock condictions but included a wide spectrum of civil engineering practice: foundations, embankment dams, aexcavations, tunnels, highways, waste disposal, port and marine structures, and heavy construction.

This paper starts with an abstract of Sowers' paper as a reference framework. Afterwards, a short description of the participation of the engineer as a decision maker in the development of projects is presented; references are made to the principles of environmental impact assessment best practice and the IAIA'02 congress conclusions regarding DAD (decide, announce, defend) vs. DDD (discuss, decide, deliver) project management processes. Finally, based on Sowers' experience, a thesis is put forward about the incidence of human factors in the environmental and social failure of projects, stressing the difference between the project phase in which an environmental or social problem is originated (planning--including site selection; design; construction; or operation) and the project phase(s) in which it may turn up.

Key words: *decision makers, environmental impact assessment, project management process, environmental failure, social failure*

THE WRITING OF EIS FOR ELECTRIC PROJECTS IN MEXICO

Montañez-Cartaxo, Luis E.
Federal Commission of Electricity (CFE)
Periférico Sur 4156, 4th floor, 01900-Mexico, D.F. Mexico
+52 (55) 5229 4400, exts. 44100, 44101
Fax: +52 (55) 5229 4400, ext. 44007
lmontanez@cfe.gob.mx

The preparation of major reports, like environmental impact statements (EIS), imply specific problems. It is the sort of report that regularly gives writers ulcers.

This paper deals mainly with the process of writing an EIS for electric projects: organisation, preparation, drafting and scheduling. An analysis is made of more than 25 EIS presented by the Federal Commission of Electricity (CFE) to the Mexican environmental authority over the last three years, which include a wide variety of projects, from short (4.5 km) and long (440 km) transmission lines to combined cycle generating plants with up to 700 MW capacity.

The conclusion is that after all the field and laboratory environmental and social analyses and studies needed for a certain project have been done (site selection, environmental inventory, potential effects screening, significant impacts evaluation, etc.), theoretically about 4.5 months have to be spent in writing the EIS, as an average. The final document will be around 300 pages long and include more than 110 tables, around 50 figures, and 40 photographs, in order to satisfy the ten most important questions established in the environmental authority guide for preparing EIS related to electric projects.

Key words: *environmental impact statement, electric projects*

THE ASSESSMENT OF CUMULATIVE EFFECTS IN A DEVELOPING COUNTRY CONTEXT: THE CASE OF SOUTH AFRICA

van der Walt, Andries; Jones, Carys; Jay, S.A.
School of Planning and Landscape
University of Manchester
Oxford Road, Manchester, M13 9PL UK
a.j.van-der-walt@stud.man.ac.uk
ggfajvdw@puknet.puk.ac.za

Due consideration of cumulative environmental effects is increasingly recognised as an issue of critical importance for the continued development of environmental assessment (EA). Today it is accepted as an essential feature of the focus on sustainable development and an area that undeniably needs strengthening in EA theory and practice. The importance of this issue is further underlined in developing countries where stressed socio-economic, political and environmental conditions render the livelihoods of communities particularly susceptible to environmental change by cumulative effects.

This paper focuses on the situation regarding the assessment of cumulative effects in the EA requirements and practice of South Africa, as an example of a developing country. It firstly explores the treatment of cumulative effects issues in the environmental assessment and management legislation, guidelines and policies of South Africa, presenting the results of a systematic analysis. It demonstrates the emergence of different approaches to cumulative effects in South African law and policy, and comments on the strengths, weaknesses and desirability of each.

The paper then offers an overview of case studies from South Africa where cumulative effects emerged as an issue of concern, and where such effects were addressed to some extent. An attempt is made to comment on the approaches followed and emerging trends that could be recognised. Secondly, evidence is provided of cases where cumulative effects were identified as an issue, but where inadequate assessment of these issues had negative ramifications for the project.

The analytical overview presented in this paper shows that, although there is considerable scope for improvement, EA practitioners in South Africa are growing more attentive to the importance of cumulative environmental change and are finding innovative ways to address these effects in EA studies. It is suggested that the adoption of smaller changes to EA processes could bring significant improvements to this issue.

Key words: *cumulative effects assessment, developing country, South Africa*

VANCOUVER 2010 OLYMPIC GAMES: SOCIO-ECONOMIC IMPACT ASSESSMENT FOR HALLMARK EVENTS

Hardy, David R.
364 Davenport Road, Toronto, ON M5R 1K6 Canada
+1 416 944 8444 Ext. 222
Fax: +1 416 944 0900
davehardy@hardystevenson.com www.hardystevenson.com

This paper discusses the importance of Social Impact Assessments (SIA) for planning, organizing and implementing hallmark events. Hitherto, organizers of hallmark events have conducted few, if any, SIA studies. The very nature and structure of these events require that the implementation of the event occur in an economic and timely fashion. As a result, temporary, goal-oriented organizations, typical of mega-events, generally do not undertake long-term monitoring or research regarding social impacts prior to, during, and following the event. Consequently, there are many opinions on the effects of hallmark events that are not supported by data.

SIA is a relatively new component of hallmark events. Social impacts need to be taken into account during the bidding, organizing, and hosting phases of such events to assure a long-term success. In this respect, Canadian initiatives to conduct preliminary assessments by Bid and Organizing Committees are at the forefront. The Vancouver 2010 Winter Olympic and Winter Paralympic Games' Preliminary Social Impact Assessment exemplify how hallmarks events are slowly evolving to incorporate SIA studies as an important component of their planning process.

Two firms, Rewerx (Vancouver) and Hardy Stevenson and Associates (Toronto), were commissioned to complete a preliminary social impact assessment for the Vancouver 2010 Winter Games. Their review and analysis of past Olympic Games found that most SIAs completed for hallmark events are anticipatory, with little post-event analysis, and lack a Social Sciences methodology. As a result, comments on the legacy of past Olympic Games relied on pre-event speculation to identify negative social impacts rather than hard empirical data. Therefore, a sound approach for assessing social impacts during and after these events is necessary in order to evaluate the effects of hallmarks events on communities

Key words: *Vancouver 2010 Olympic Games, social impact assessments (SIA) for hallmark events*

BIODIVERSITY ASSESSMENT IN THE OIL SANDS REGION, NORTHEASTERN ALBERTA

Sherrington, Mark
Golder Associates Ltd.
1000, 940-6th Ave., SW, Calgary AB T2P 3T1 Canada
+1 403 216 8918 Fax: +1 403299 5606
Mark_Sherrington@golder.com

Environmental Impact Assessments in the Oil Sands Region of northeastern Alberta, Canada, evaluate biodiversity by considering two key issues: the potential effect on landscape-level biodiversity as measured by fragmentation and heterogeneity analyses; and the potential effect on ecosystem-level biodiversity as measured by changes in vegetation units ranked high, moderate and low for biodiversity potential. The approach of a nested interrelationship of landscape, ecosystem, species and genetic levels is due, in large part, to the growing recognition that these processes affect and are affected by the dynamic interaction among ecosystems. Ecosystem level information is obtained through combining several parameters measured by several different disciplines. Parameters measured in the biodiversity assessment are reviewed periodically by the Cumulative Environmental Management Association (CEMA), an organization that is comprised of aboriginal, environmental and industry stakeholder members of issue-based working groups. Vascular and non-vascular plant species information including plant species richness and the number of special status plant species (COSEWIC) is collected during the vegetation assessment. In addition, vegetation community information including the number of structural layers is noted. Wildlife data is collected through browse-pellet ungulate surveys, winter track counts, breeding bird surveys, small mammal surveys and amphibian surveys. Overall species richness and overlap in the use of habitats by species and the number of special status animal species is determined from these field surveys. Aquatic ecosystem data includes fish species richness and habitat use, and aquatic and submergent plant species richness. Residual effects on biodiversity are assessed once industrial activity has ceased, reclamation is completed and the establishment of mature vegetation communities has occurred at closure. Biodiversity residual effects are measured on the impacts that remain once the mitigation of environmental effects has been implemented. Mitigation for effects on biodiversity includes reclamation of pre-disturbance vegetation communities to equivalent ecosystems.

Key words: *biodiversity, Oil Sands, northeastern Alberta*

CAPACITY BUILDING PROJECT FOR PUBLIC PARTICIPATION IN EIA IN SOUTHERN AFRICA THE CALABASH PROJECT

Croal, Peter
Southern African Institute for Environmental Assessment
P.O. Box 6322, Ausspannplatz, Windhoek, Namibia
+264 61 220579 Fax: +264 61 259183
www.saiea.com

The Johannesburg Plan of Implementation describes "good" governance as being essential for sustainable development. Coupled with this is NEPAD which views good governance as an essential element of the peer review process. Most

consider good governance to mean: transparent decision making, access to information and justice, public participation, coherence, subsidiarity (decisions taken at the appropriate level), respect for human rights and accountability. A well planned and implemented EIA or SEA does respect all these conditions for good "environmental" governance. However, in Africa, one of the elements of the EIA process which is quite weak is public participation. This has large opportunity costs in terms of community empowerment, environmental performance and displaying true democratic reform through the NEPAD peer review process. The Southern African Institute of Environmental Assessment is undertaking a 2 year capacity development project to address the EIA and public participation process in the SADC region. The program is supported by the World Bank and the Canadian International Development Agency. To date a comprehensive Situation Assessment has been completed as well as the first regional planning workshop. An EA and Public Participation web site is now being developed and ex-post analyses of southern African public participation programmes are being analyzed for lessons learned and from which template methodologies can be developed. Other activities will include tool development, network building, training and case study application. The IAIA 04 presentation will be as interactive as possible so that the participants can contribute their knowledge, advice and opinions to help guide the project's outputs. Direct involvement in the project by IAIA 04 participants will be invited.

Key words: *capacity building, EIA, environmental impact assessment, Southern African Institute for Environmental Assessment, public participation, SADC, Southern Africa*

IMPLEMENTATION OF THE SEA DIRECTIVE IN ENGLAND

James, Emma
TRL Limited
Old Wokingham Road
Crowthorne, Berkshire RG45 6AU UK
+44 01344 770192 Fax: +44 01344 770918
ejames@trl.co.uk
www.trl.co.uk

The SEA Directive is likely to come into force in England in 2004. After this time, public authorities will have to carry out environmental assessments on plans which are deemed to have significant effects. This will include such plans as land use plans, Local Transport Plans and regionally based plans dealing with subjects such as waste and water management. There are many indications that the implementation of the SEA Directive in the UK will face some unique difficulties. Surveys undertaken by TRL and others have shown that awareness of the SEA Directive's requirements is low in the UK. In addition to this, SEA regulations have not yet been published (at the time of writing (December 2003)) and the land use planning system itself is going through a period of major reform. The ability of environmental bodies to cope with the extra responsibility placed on them is also in doubt with all four environmental bodies in England (Environment Agency, Countryside Agency, English Heritage and English Nature) expected to have to rigorously prioritise the involvement they have in SEA production. This paper will examine what the impact of these driving forces are likely to be on the implementation of the SEA Directive in England, examine what will be needed in order to help public authorities cope with the requirements of the Directive and examine some likely consequences if awareness and understanding are not raised.

Key words: *SEA, England*

A COMPARISON OF ARCHIVAL VERSUS PERCEPTUAL MEASUREMENT OF THE IMPACT OF VOLUNTARY ENVIRONMENTAL INSTRUMENTS ON CORPORATE ENVIRONMENTAL PERFORMANCE

Annandale, David
Division of Science and Engineering
Murdoch University
South Street, Murdoch WA 6150 Australia
+618 9360 6081 Fax" +618 9360 6787
annandal@essun1.murdoch.edu.au

Morrison-Saunders, Angus
Division of Science and Engineering
Murdoch University
+618 9360 6125 Fax: +618 9360 6787
angus@essun1.murdoch.edu.au

Hughes, Michael
Division of Science and Engineering
Murdoch University
mjhughes@it.net.au

In the last decade there has been increasing emphasis on the use of voluntary tools such as corporate environmental reporting (CER) and environmental management systems (EMS). However there has been relatively little research on the impact of these tools on the actual environmental performance of corporations. At IAIA '02 we presented the findings of a survey of 40 companies operating in Western Australia to determine the extent to which the implementation of voluntary tools has influenced corporate environmental performance. That research was undertaken using 'perceptual measurement' as reflected by the views of company executives. During 2003 we revisited the previously surveyed firms, and undertook 'archival measurement' to determine the degree of accuracy of the original survey. The archival measurement process sought objective evidence of statements made in the original work. Overall, the results were roughly comparable, regardless of the way in which evidence was collected. We also found that the influence of voluntary instruments was not as strong in practice as the existing literature suggests it should be. We found that most respondents believed that EMS had influenced environmental management practices to some extent. On the other hand, CERs were seen more as a public relations exercise and had less impact on company practices compared to EMSs. Other factors that influenced corporate environmental performance

included company size, level of experience with environmental management, and level of corporate and financial support for environmental self-regulation programs within the organisation.

Key words: *corporate environmental reporting, environmental management systems, voluntary environmental instruments, environmental performance, archival and perceptual measurement*

ADDRESSING CLIMATE CHANGE AND ITS UNCERTAINTIES IN IMPACT ASSESSMENTS

Byer, Philip H.
Dept. of Civil Engineering
Division of Environmental Engineering
University of Toronto
35 St. George Street, Toronto, ON M5S 1A4 Canada
+1 416 978 5980
byer@ecf.utoronto.ca

Yeomans, Julian Scott
Management Science Area
Schulich School of Business
York University
Toronto, ON M3J 1P3 Canada
+1416 736 5074
syeomans@schulich.yorku.ca

Climate change (sometimes referred to as global warming) is an increasingly important global and regional concern, which can have significant implications for the environment and for projects that affect the environment. This paper, which is based on work carried out for the Canadian Environmental Assessment Agency, discusses the relevance of climate change to project-based EIAs, and where and how climate change should be addressed in EIAs, including the estimation of the effects of the project on greenhouse gases emissions, effects of climate change on the project, and effects of climate change on the prediction of project impacts. Because of the importance of uncertainties about climate change, concepts and methods for addressing these uncertainties, including scenario, sensitivity and probabilistic analyses, are explain and illustrated using an example based on a hydroelectric project. The need for guidelines for addressing climate change in EIAs is also discussed.

Key words: *climate change, impact assessment, uncertainties*

SUSTAINABILITY ASSESSMENT: BASIC COMPONENTS OF A PRACTICAL APPROACH

Gibson, Robert B.
Environment and Resource Studies
University of Waterloo
Waterloo, ON N2L 3G1 Canada
+1 519 888 4567 x3407 Fax: +1 519 746 0292
rbgibson@uwaterloo.ca

The last few years have brought a variety of experiments with forms of sustainability assessment. Some initiatives, such as the Voisey's Bay nickel mine-mill environmental assessment in Newfoundland and Labrador, Canada, have centred on adoption of sustainability-based criteria in an otherwise conventional project-level environmental assessment. In others, such as the European Union's efforts in assessing trade liberalization options and some urban growth management initiatives here in British Columbia, the applications have been at the strategic level and connected to policy and planning regimes.

While much of the work so far has been exemplary, significant challenges will have to be faced if sustainability assessment is to be adopted and applied more broadly. Of these, perhaps the greatest are

- the tension between giving comprehensively integrated attention to intertwined factors (usually categorized as economic, social and biophysical) and designing processes that are comprehensible and manageable
- the tension between inevitable complexity and the desire for confident predictability
- the tension between being sensitive to specific contexts and providing consistent guidance for decision makers and other participants

Sustainability assessment is attractive, and arguably necessary, because it promises to cover the full suite of relevant factors and interrelations, recognizes complexity, and builds on the environmental assessment tradition of broad processes that address case-specific realities. But demands for analytical manageability, predictive accuracy and process certainty remain and in practice none of the advantages of sustainability assessment is guaranteed.

This paper considers the major tensions and their implications for the design of sustainability assessment processes - for application to private as well as public sector undertakings. It gives particular attention to the problem of integrated attention to relevant considerations and outlines an approach to sustainability assessment that avoids the usual dis-integrating economic, social and biophysical categories or "pillars" of sustainability.

Key words: *sustainability assessment, integration, complexity, processes*

YOUR ASSESSMENT OF MY NEEDS: CONTRASTING CRISIS AND NORMAL IMPACT ASSESSMENT

Kelly, Charles
Benfield Hazard Research Centre
Univ. College London
c/o 3225 Oliver St NW, Washington, DC 20015 USA
+ 1 202 363 3285
72734.2412@compuserve.com

There appears to be a significant gap between impact assessment in normal times and in crises such as disasters,

accidents or conflict. In the former, the process is one of a deliberative, often slow and detailed, weighting of positive and negative impacts from one or more proposed courses of action. On the other hand, crisis assessment is often openly agenda-driven, focused more on needs and less on impact and usually undertaken without an initial clear understanding of possible actions. In fact, in a crisis assessment often focuses on trying to gain understanding of a fluid situation so that appropriate actions can be defined and implemented. The paper reviews the differences between normal impact assessments and crisis needs assessments to highlight the areas of substantial differences as well as commonality. Focusing on crisis assessment, the paper summarizes the concepts and approaches behind several key assessment procedures (e.g., food security, nutrition, health) and includes a discussion of the Sphere standards for humanitarian assistance as a framework for crisis needs assessment. The paper also briefly reviews experiences with the Rapid Environmental Impact Assessment in Disaster project, an effort to fill a gap in environmental impact assessment procedures in crises. The paper concludes with recommendations as to how the gap between normal and crisis impact assessments can be bridged to make the impact assessment process in normal and crisis times more effective.

Key words: *crisis, disasters, accidents, impact and needs assessments*

TOWARDS INSTITUTIONALIZING POLICY HEATH IMPACT ASSESSMENT IN QUÉBEC

Banken, Reiner
Agence d'évaluation des technologies et des modes d'intervention en santé
2021, avenue Union, bureau 1040
Montréal, QC H3A 2S9 Canada
+1 514 864 9933 Fax: +1 514 873 1369
reiner.banken@aetmis.gouv.qc.ca

Québec has a longstanding history in HIA as part of EIA with a high degree of institutionalization. A new Public Health Act, which took effect in June 2002, has created the legal basis for the development of an independent Policy HIA process. The implementation strategy, which is currently being developed, aims at integrating the HIA into the current policy development and analysis process by making the policy proponent responsible for conducting the HIA with the support by the Department of Health. This very fundamental characteristic of the proposed process creates a clear distinction between HIA as a research process and HIA as an administrative process. Indeed, the research component of HIA will take two forms: 1. The Institut national de santé publique will produce synthesis of knowledge concerning the links between changes in health determinants and impact on health status and 2. A formal research program administered by the Fonds de la recherche de santé du Québec and the Fonds québécois de la recherche sur la société et la culture. The following challenges must be met for an efficient Policy HIA process: 1. The leadership of the Department of Health in creating open communication channels with the other government departments. 2. A pragmatic use of the legal powers of the new Public Health Act. 3. Strong links between the HIA research component and the administrative HIA process. 4. Diffusion of the knowledge concerning the links between policies, health determinants and health status among government departments, politicians and the general public. Meeting these challenges through sustained efforts over the coming years will lead to an efficient implementation of Policy HIA, to Healthy Public Policies and finally to improved Health.

Key words: *health impact assessment, strategic assessment, public policy, institutionalization*

TRADITIONAL KNOWLEDGE AND THE IMPACT ASSESSMENT OF A GAS GATHERING SYSTEM

Kotchea, Frank
Nahendeh Land and Environmental Services
General Delivery, Fort Liard, NT, X0G 0A0 Canada
+1 867 770 4571 Fax +1 867 770 4573

Melton, Derek A.
Golder Associates Ltd.
1000, 940 6th Ave. SW, Calgary, T2P 3T1 Canada
+1 403 2995659 Fax: +1 403 299 5606
dmelton@golder.com

Forkheim, Terry
Anadarko Canada Corporation
425 1st St. SW., Box 2595 Stn M
Calgary, T2P 4V4 Canada
+1 403 231 0222 Fax: +1 403 231 0356
terry_forkheim@anadarko.com

One way to facilitate meaningful involvement of aboriginal peoples in impact assessment is through the support of indigenous or traditional knowledge (TK) studies. Here we describe the methods and some results for a TK study completed as part of the EIA for a proposed gas gathering system in the Liard Valley of the Northwest Territories, Canada. The agreed goal for the study was: "To use TK in the same way that scientific information is used, to produce a better gas project, which would have least harm to people and the environment". Methods included existing data review, interviews with people who traditionally use the land in the project area and field verification. TK results were mainly produced in mapped form, but reporting did include a list of issues and concerns related to the proposed project. The one on one interactions involved in a TK study, usually conducted in peoples homes or camps on the land, can be more conducive to generating in depth discussion of issues than community meetings. Challenges of executing TK studies specifically for impact assessment purposes are many, not the least being agreeing to timelines. The importance of having a clear agreed goal prior to study initiation also cannot be over emphasized.

Key words: *indigenous knowledge, traditional knowledge, gas pipeline, impact assessment, Northwest Territories, Canada*

A STUDY ON THE ASSESSMENT OF OPEN-DUMPING LANDFILL FOR THE POST-CLOSURE MANAGEMENT

Sang-Pyo, Hong
Dept. of Environmental Eng., Chongju University
36 Naedok-Dong, Sangdang-Gu
Chongju City, Chungbuk Province 360-764 South Korea
+82 43 229 8576 Fax: +82 43 229 8432
sphong@chongju.ac.kr
cyber.chongju.ac.kr/~spho

Kim, Kwangyul
Dept. of Environmental Eng., Chungbuk University
48 Gaesin-Dong, Heungduk-Gu
Chongju City, Chungbuk Province 360-763 South Korea
+82 43 261 2466 Fax: +82 43 268 7621
kykim@cbucc.chungbuk.ac.kr

To land-use a closed landfill site environmentally secure condition, it is necessary to verify the stabilization level of landfilled waste. To assess waste stabilization of an open-dumping landfill which is located at the upper drainage basin of Lake Paldang utilized for Seoul Metropolitan water supply, the landfill site was surveyed. Leachate, groundwater, landfill gas, landfilled wastes of this landfill were analyzed, and the analysis results were assessed from "the criteria of waste stabilization that promulgated by Korean Ministry Environment (CWS)." This open-dumping landfill had the final soil cover and poor landfill gas extraction devices, but this was leaking leachate apparently and were supervised improperly and neglectfully by local governments. Based on the CWS, BOD/CODcr in leachate were less than or slightly more than 1/10, which means the waste stabilization of this landfill was almost completed. Qualities of groundwater sampled from monitoring wells located at outside of landfill were adequate for " the Criteria of Domestic Use in Groundwater Criteria." CH4 as a landfill gas was less than 5%, which means solid wastes was already stabilized. But combustible materials except plastics were 3.97 - 9.34%, which implies solid waste was still not stabilized. From these results, this open-dumping landfill was not completely stabilized. But the impact of leachate discharge to Lake Paldang would be negligible, because small amount of leachate was almost stabilized and this landfill is distant from Lake Paldang nearly 182km in stream and river route. Regarding to this landfill surveyed, it can be concluded that the criteria factors of waste stabilization proceed in different rates at different conditions. From this result, the land-use of this landfill for another purpose should be put off until the stabilization of landfilled waste is completed.

Key words: *land-use, post-closure management of landfill, assessment of waste stabilization*

NEW TRENDS OF ECOLOGICAL RESTORATION AND IMPACT ASSESSMENTS IN JAPAN

Tanaka, Akira
Musashi Institute of Technology
School of Environmental and Information Studies
Ushikubo-Nishi 3-3-1
Tsuzuki-ku, Yokohama 224-0015 Japan
+81 45 910 2918 Fax: +81 45 910 2929
tanaka@yc.musashi-tech.ac.jp
www.yc.musashi-tech.ac.jp/~tanaka-semi/

Currently ecological restoration has been accelerated in Japan. "Biotope making" as a small scale ecological restoration is very popular in schools and parks. The 1997 EIA law includes compensatory mitigation. Large scale restoration will be active because of the 2003 Nature Restoration Law.

Although ecological restoration is very important in terms of protecting biodiversity, several problems must be solved. What sort of ecological assessment methods must be used in these activities? Is EIA unnecessary for ecological restoration project? What are the goal/objectives of these ecological restoration activities?

This study reviewed these institutions and activities of ecological restoration from the point of view of habitat restoration for wildlife.

Key words: *ecological impact assessment, HEP, mitigation, ecological restoration, biodiversity, habitat*

THE ROLE OF EIA FOR DECISION MAKING AND FORMULATION OF ALTERNATIVES - EVALUATION OF INFLUENCE

Hokkanen, Pekka
University of Tampere
Department of Political Science
33014 Tampereen yliopisto, Finland
+358 14 697 286 Fax: +358 14 614 273
pekka.hokkanen@ymparisto.fi

The aim of this paper is to examine the influence of environmental impact assessment (EIA) procedures on decision-making in three project. The main question is, how EIA effects on the formulation of alternatives of certain project? In addition to three cases a theoretical framework of evaluation and theoretical models of influence of EIA-procedure are presented.

The decision-making process was divided into three time periods (prior to, during and after the EIA), and a comparison between these made it possible to pinpoint changes in the alternatives and the decision-making process of the project. In addition to the influence of the EIA the framework was able to handle the main factors from context too. The analysis of the projects showed that the influence is not a one-time impact occurring after the EIA procedure, but rather that its effects came out all along the decision-making process. The EIA influences so that alternatives are

prognosticated, compared and justified. With regard to the formulation of alternatives and to the consideration of environmental effects, it seems that the direct influence of EIA on the preparations for decision-making are even more important than its direct influence on the formal decision-making. There are significant differences in the attitudes to the EIA procedure as an instrument for planning and decision-making. This makes it clear that the consideration of EIA is by no means fully established, and that its influence depends on the context of decision-making. The history of each project also causes preconditions for the formulation of alternatives.

Cases the study deals with are the Fingrid Ltd's 400 kW power line between Muhos and the Swedish border; the Posiva Ltd's nuclear waste deposit; and the Central Finland road district's project for improving trunk road 59.

Key words: *influence of EIA, decision making, formulation of alternatives, evaluation*

EFFECTIVENESS OF EIA AND ITS FRAMEWORK IN TANZANIA: CHALLENGE FOR ACHIEVING SUSTAINABILITY

Chambi, Alexander
Centre for Environmental Assessment and Resources Management
P.O Box 33315, Dar es Salaam, Tanzania
+255 (0)741 480349
alexchambi@yahoo.com

Tanzania recognizes the central role of environmental impact assessment (EIA). Encouraging progress has been made regarding the promotion and implementation of Environmental Impact Assessment in Tanzania since the 1992 United Nations Conference on Environment and Development. A relatively developed sectoral legislation and policies now exist in Tanzania and EIA being adopted as a planning tool in many sectors. There are however certain challenges to be met before EIA reaches its full potential as a key tool in promotion of sustainable development.

Current changes in macro-economic policies in Tanzania (economic reform) have to a great extent promoted the rate of investment in private sector. This changes has contributed to a need of critical and analytical views on the current practice of EIA in Tanzania in order to guide private investments in a more sustainable way. It is clear that in absence of effective environmental legislation and framework investment may pose a serious threat to the environment resulting in weaker environmental control and intensive exploitation of natural resources.

The finding of the paper demonstrate a clear picture of the key issues affecting the use of environmental assessment in Tanzania and moreover it looks holistically at the conservation of our environment parallel to industrial development which creates much needed wealth and improve the standard of living of all our people.

Key words: *sustainable development, environmental assessment, environmental legislation, EIA framework*

EXPERIENCE WITH APPLYING ADVANCED AIR QUALITY AND HEALTH ASSESSMENT METHODS TO ADDRESS PUBLIC AND AGENCY CONCERNS ABOUT THE EFFECTS OF GAS-FIRED POWER GENERATION ON VANCOUVER ISLAND

Edwards, Wayne; Humphries, R.G.
Levelton Consultants Ltd.
#150, 12791 Clarke Place
Richmond, BC V6V 2H9 Canada

The Vancouver Island Generation Project is proposed for an industrial area near Nanaimo, BC and would generate 265 MW of electricity by burning natural gas in a combined cycle gas turbine power plant. The plant would incorporate best available control technology and meet emission levels much lower than required under existing provincial regulations. State-of-the-science methods were applied to define the local meteorology and to model the local and regional effects of plant emissions on air quality. In the absence of provincial guidelines for conducting health impact assessments, methods were developed and applied to assess the potential human health effects of emissions during start-up and operation of the proposed plant. These results were used in a comprehensive assessment of the environmental effects of the project in an application for a project approval certificate reviewed by the BC Environmental Assessment Office in 2002/03. The project received an approval certificate in December 2003.

One of the main public concerns about the proposed plant was the potential effect of emissions on air quality and human health, particularly in regard to the effects of fine particulate matter (PM2.5) and trace hazardous contaminants. The paper discusses the issues raised about the effects of project and cumulative emissions, the advanced methods and current guidelines applied to address these issues, and the efforts made to resolve the concerns of agencies and the public about the limitations and uncertainties of these methods. Although the effects of project emissions on ambient concentrations were predicted to be very low and existing air quality in the air shed is good compared to air quality guidelines, public and agency concerns about the effects of PM2.5 emissions on human health were difficult to resolve, because current epidemiological data suggests health effects may occur at concentrations below the Canada-Wide PM2.5 Standard. The public and health agencies were also concerned about the uncertainty in predicted health effects that arise from the combined effect of uncertainties in source emission rates, modelled meteorological conditions and modelled pollutant concentrations, which added to the complexity of the review process and to the difficulty reviewing agencies had with reaching a conclusion on the acceptability of the project.

Key words: *electricity generation, EIA, health effects*

SOCIAL IMPACT ASSESSMENTS: A CASE STUDY OF THE WEST-EAST NATURAL GAS PIPELINE IN CHINA

Gill, Eleanor
Institute of Asian Research
University of British Columbia
Rm. 1037, St. John's College-UBC
2111 Lower Mall, Vancouver, BC V6T1Z4 Canada
+1 604 827 4146
Ellie_San@hotmail.com

Private participation in infrastructure projects in China largely consists of joint ventures between foreign corporations and government or quasi-government entities. The legal contracts therefore represent a negotiated balance between government and private needs. However, recent negotiations over potential foreign participation in the West-East Natural Gas Pipeline from Xinjiang to Shanghai reveal that in addition to these public and private needs and interests, attention is being paid to another set of public interests, those of local project-affected people. Interestingly, the foreign companies are playing the leading role in taking these interests into account. As the leader of the foreign consortium, Royal/Dutch Shell voluntarily contracted the United Nations Development Program to conduct China's most extensive Social Impact Assessment (SIA) to date. It is possible this was only an attempt to raise its own profile as a socially responsible corporation and is inconsequential to Shell's ultimate negotiation demands. However, given the recent history of violent and costly local opposition to public-private energy infrastructure projects in countries like Nigeria and Columbia, not adequately assessing and addressing local interests through SIAs increasingly poses a risk both to project stability and company reputation. And especially given the long-term and costly nature of this particular pipeline project, it seems likely that this SIA was also an extensive political risk analysis and mitigation measure. The challenge facing the increased use of SIAs in such public-private infrastructure projects, however, is to ensure that local needs and interests are not only documented but actually addressed. This requires greater coordination between local governments and the foreign companies, as well as financial and political support for the strengthening of China's legal system, compliance with WTO obligations, greater civil society involvement in both monitoring projects and lobbying for social causes, and the increased use of international standards and certification processes.

Key words: *social impact assessments, west-east natural gas pipeline, public-private energy infrastructure projects, local needs and interests, political risk analysis, political risk mitigation, addressing local needs*

THE KIEV PROTOCOL ON STRATEGIC ENVIRONMENTAL ASSESSMENT - A GLOBAL TOOL FOR SUSTAINABLE DEVELOPMENT?

Bonvoisin, Nick
United Nations Economic Commission for Europe
Palais des Nations
Geneva 10 Geneva 1211 Switzerland
+41 22 917 11 93 Fax: +41 22 917 01 07
nicholas.bonvoisin@unece.org
www.unece.org/env/

The UN Economic Commission for Europe (UNECE) Protocol on Strategic Environmental Assessment (SEA) was adopted in Kiev on 21 May 2003. Thirty-six UNECE member States plus the European Community (EC) signed the Protocol. It is now open for ratification. Many of the EC member and acceding States are including the provisions of the SEA Protocol in their legislation implementing the EC Directive on SEA (2001/42/EC). There is, therefore, reason to expect a rapid entry into force of the Protocol, which will occur once sixteen UNECE member States have ratified it. Once in force, the Protocol will be open to other States, subject to approval by the existing Parties to the Protocol. Several States outside the UNECE region have already expressed an interest in the Protocol, including the Lebanon and the Islamic Republic of Iran. There is, therefore, reason to expect an expansion in its geographical area of application beyond the UNECE region. The main question implied in the title of this paper is whether the SEA Protocol provides an effective means for promoting sustainable development, a rather bold question to which this paper attempts to provide an answer, using as its criteria the IAIA Strategic Environmental Assessment Performance Criteria (IAIA, 2002) and a series of questions asked by Benson in his recent critique of environmental impact assessment, including "how can we assess whether a proposed policy, plan, programme or project will lead our society in the direction of more or less sustainability?" and "how can a decision-maker evaluate whether a proposal is consistent with principles of sustainable development [...]?" (Benson, 2003). In addition, the paper suggests that the Protocol will effectively implement some of the key provisions of the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.

Key words: *strategic environmental assessment, multilateral environmental agreements, sustainable development*

IMPACT SCORING AND AGGREGATION FOR SEA

Tomlinson, Paul
Environmental Assessment & Policy
TRL Limited
Old Wokingham Road, Crowthorne RG45 6AG UK
+44 1344 770800

1.1 This paper focuses upon the work of a European collaborative research action - COST 350 - Integrated Assessment ofE nvironmental Impact of Traffic and Transport Infrastructure. The main objective of the Cost 350 Action is to establish a operational concept, integrating at regional scale, all the environmental aspects of traffic and land-

transport infrastructure to assist policy makers in an earlier stage of their decision making on transport and m obility.

1.2 Best practice in relation to impact scoring and aggregation methods for transport planning at a sub-regional scale will be considered. Some of the issues to be addressed comprise:

a) Significance criteria - a standard set for consistency or local flexibility?
b) Dealing with uncertainty
c) Equivalence across impact topics through scoring
d) What different scales are applicable
e) Transparency in the assignment of impact scores
f) The role of the public in impact scoring—who sets the criteria
g) How to deal with future values in impact scoring

1.3 Aggregation methods can be defined as the means by which individual impact scores are combined to arrive at an overall score or summary of the environmental performance of a transport strategy or its component measures. Among the issues:

a) Loss of environmental information
b) Introduction of bias
c) Level of quantification
d) Trading beneficial and adverse impacts
e) The precautionary principle
f) Dealing with show-stopper or red flag impacts
g) Averaging and weighting of impacts
h) How aggregating environmental topics interfaces with other transport/community topics

1.4 This presentation will explore the issues that have been explored through the COST350 initiative seeking to draw upon the experiences of delegates wishing to contribute to this research topic.

Key words: *significance criteria, sea, impact aggregation, eu research, transport*

A MODEL OF SOCIAL IMPACT FOLLOW-UP FOR LOCAL AND REGIONAL SUSTAINABLE DEVELOPMENT

Gagnon, Christiane
Université du Québec à Chicoutimi
555 boul. de l'Université
Chicoutimi, QC G7H 2B1 Canada
christiane_gagnon@uqac.ca

In 1997, a five-year multidisciplinary research program on SIA and follow-up was conducted, in real time i.e. following the project cycle of the implementation of an industrial megaproject (Alcan, Quebec, Canada). The insights and lessons derived from the report are aimed at improving formal and informal practices of social impact assessment and follow-up as well fostering the building capacity of the stakeholders and the host communities.

The results of the research program show that the characterization of the community and belonging region is a prerequisite to the near-term analysis of the social impacts of planned change as well as the development of more appropriate maximization and mitigation measures. The study demonstrates, for EIS, the importance of: 1) systematically and rigorously assessing the social impacts prior to public hearings, 2) adopting a comprehensive conception of social impacts, 3) identifying a methodology for measuring and monitoring them during the EIS process. In the case study, the EIS exhibits a low level of concordance between the components described and the impacts analysed. The final part of the report is related to the methodology used in EIS. A dozen of methodological observations were drawn from the different cycles of the industrial project. The research program formalizes the components of the SIA and follow-up model, which is presented in a computer animation format. Six key components and their subcomponents were identified: temporal and spatial scales, stakeholders, issues/impact categories, stages of the process, measurement and information sources, means of communication. The model is not based on a normative but rather a comprehensive and explanatory one. Its guiding principle is that a civic participation towards a better social equity and environmental justice. The model uses the representation of a bridge. This is allowed to illustrate, in a computer animation format, the links between the planned change and sustainable territorial development, the links between stakeholders, spatial and temporal scales, issues/categories of social impacts, etc.

In conclusion, a follow-up social impact model and process can, under certain conditions, provide social value-added. One of these conditions is the implementation of an integrated multidimensional approach to the impacts of planned change.

ASSESSING THE POTENTIAL OF NATURE-BASED TOURISM AS AN ECONOMIC DEVELOPMENT OPPORTUNITY FOR RURAL NORTH DAKOTA

Leistritz, F. Larry; Hodur, Nancy M.; Bangsund, Dean A.
Department of Agribusiness & Applied Economics
North Dakota State University
213B Morrill Hall, Fargo, ND, USA 58105
+1 701 231 7455 Fax: +1 701 231 7400
lleistri@ndsuext.nodak.edu

In recent years North Dakota's abundant natural resources have attracted visitors from around the country and the world. In addition to providing recreational activities for residents and visitors alike, nature-based tourism is a basic economic sector that may have substantial potential for creating economic opportunities in rural areas. To address the lack of basic information on this sector in North Dakota, a study was undertaken to assess the potential of nature-based tourism as an economic development option in the stateTs rural areas. Specific objectives of the project include to (1) identify and analyze existing agricultural and nature-based tourism enterp rises, (2) assess nature-based and

agricultural tourism demand, and (3) estimate local and statewide economic impacts of nature-based and agricultural tourism. This paper reports on the first phase of the research " a statewide survey of nature-based and agricultural tourism enterprises. A broad spectrum of enterprises offering a variety of activities and services were included in the study, including farm and ranch-based activities, wildlife viewing, birding, hunting and fishing, hiking, biking, and similar activities. A mail survey of nature-based tourism enterprises elicited a variety of information including services provided, activities offered, business characteristics, and customer characteristics. The survey findings not only will provide important benchmark information about the enterprises that make up this emerging sector but also will provide critical input for future project phases. Results of the study can be used by both private and public entities to identify opportunities for potential expansion of the tourism sector, particularly nature-based tourism, in North Dakota.

Key words: *nature-based tourism, economic development, North Dakota*

SUSTAINABILITY ASSESSMENT FOR PROJECTS AND OTHER BUSINESS DECISIONS IN SHELL CANADA

Nixon, J. Ashley
Shell Canada Limited
400, 4th Avenue S.W.
Calgary, AB Alberta T2P 2H5 Canada
+1 403 691 4965 Fax: +1 403 691 3321
ashley.nixon@shell.ca
www.shell.ca

Nathwani, Meera
Shell Canada Limited
+1 403 691 3422 Fax: +1 403 691 4255
meera.nathwani@shell.ca

Shell Canada has had a sustainable development (SD) policy and commitment in place since 1990 and SD performance has been reported publicly for twelve years. The company has a strong belief in the need to demonstrate that it is meeting broader sustainable development goals. This means looking to ways of integrating environmental, social and economic aspects across all business activities, from project opportunity screening and planning to implementation. It means being open and engaging with stakeholders. It also means addressing both short-term and long-term needs.

One important way of integrating SD into the planning stage for capital projects and other business decisions is to conduct sustainability assessments. A number of tools have been in regular use by Shell Canada that contribute to this process, such as internal HSE assessments, the application of an internal standard on product stewardship, and value assurance review and EIA for significant new projects. A new sustainability assessment tool has been developed using as a framework the seven SD principles described in the company's Commitment to Sustainable Development. In brief, this is an analysis of a project plan or proposal to determine how sustainable are its stated objectives, outcomes and overall goal. This may be gauged by the projects capacity for delivering economic, environmental and social benefits while controlling or avoiding/minimizing any negative impacts associated with its development, implementation and, ultimately its termination.

In its present form, the sustainability analysis tool has been used during the initial planning phase of a selection of projects/business decisions. The opportunity exists also to extend the use of this tool beyond project screening/planning to help measure sustainability during the life of actual business developments.

Key words: *sustainability analysis, project screening and planning, sustainable development*

BRIDGING THE GAP BETWEEN PROJECT ASSESSMENTS AND REGIONAL DEVELOPMENT DYNAMICS

Boyle, Michelle
University of British Columbia
Sustainable Development Research Initiative
Rm 214-1924 West Mall, Vancouver BC V6T 1Z2 Canada
+1 604 827 5276 Fax: +1 604 822 9191
mboyle@sdri.ubc.ca

Dowlatabadi, Hadi
University of British Columbia
Sustainable Development Research Initiative
+1 604 822 0008 Fax: +1 604 822 9191
hadi@sdri.ubc.ca

Major projects in the Canadian North are often initiated with the hope to attract follow-on development. For example, roads to mineral properties in remote areas open access and can thus attract mines, support services and communities. The challenge for environmental assessment (EA) practitioners is to adequately estimate "the cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out." [Canadian Environmental Assessment Act, Sec 16(1)a, and similar stipulations in legislative frameworks at other scales]. The concern for regional planners and the public is to balance the economic, environmental and social benefits and costs of development. This research aims to contribute to both of these agendas by providing a set of heuristics to estimate the cumulative impacts of a development project that incorporates regional dynamics and the broader agenda of sustainable community development. The methodology is based on the concept of a development project as an attractor to subsequent development. It involves an analysis of past projects, historical development patterns and the socio-economic and demographic impacts to northern communities. Heuristics include a classification of project attractor types, impact multipliers for each type, and algorithms for incorporating the interaction of competing projects and activities. The classification scheme will be based on the study of past

projects and development timelines, as well as on initial and cumulative impacts. Insights from the analysis can then be used to anticipate future development outcomes in a given context. We will demonstrate the value of this extension to standard EA practice through application to a case study in the Canadian Arctic.

Key words: *cumulative effects assessment, regional planning, socio-economic impacts, Canadian Arctic*

ADAPTING IMPACT ASSESSMENT TO ALTERNATIVE DECISION-MAKING CATEGORIES

Leknes, Einar
Rogaland Research
P.O. Box 8046, 4068 Stavanger, Norway
+47 51 87 50 00 Fax: +47 51 87 52 00
einar.leknes@rf.no • www.rf.no

The logic of Environmental Impact Assessment (EIA) is to influence public decision-making by generating knowledge about external impacts of proposed projects. Such decisions encompass both projects approval and conditions to impose on the projects. The EIA system in general have achieved acknowledgement as an efficient tool for sustainable development. However, in several occasions and especially in controversial projects, the specific influence from EIA on decision-making seems to be insignificant. This paper tries to illuminate some possible explanations of this defect in regard to the prescribed influence of EIA.

The actual decision-making contexts represent one kind of explanation of lacking influence from EIA. These contexts vary between consultants performing the EIA, the developers and different public decision-makers. Examples of how this multiplicity setting and different linkage of decisions can affect the actual decision-making are described in order to illustrate this perceived defiance.

In order to get a more fundamental understanding of the problem, the EIA process is related to different public decision-making categories. These categories encompass among others negotiation, voting, administrative assessment, experiments and rule compliance. The mismatches between the logic of EIA and the empirically most relevant public decision-making typologies are then discussed. Emphasis is put on how the context (degree of political / professional conflict) can change decision-patterns. Five typical issue-specific decision-making processes from the EIA-process in the petroleum sector in Norway constitute the empirical basis for the analysis.

The paper concludes with ideas on how the EIA process and the EIS can adapt to specific decision-making typology and -context in order to be of greater importance for the decision-making and the decision-makers.
Key words: *decision-making, politics, environmental impact assessment, Norway, petroleum sector*

EVOLVING OPPORTUNITIES FOR THE COLLABORATIVE MANAGEMENT OF CUMULATIVE EFFECTS: THE OIL AND GAS INDUSTRY IN BRITISH COLUMBIA, CANADA

Hegmann, George
AXYS Environmental Consulting Ltd.
300-805 Eighth Ave. SW, Calgary, AB T2P 1H7 Canada
+1 403 750 7668 Fax: +1 403 269 5245
ghegmann@axys.net

Macdonald, Michelle
AXYS Environmental Consulting Ltd.
+1 403 750 2447 Fax: +1403 269 5245
mmacdonald@axys.net

Green, Jeff
AXYS Environmental Consulting Ltd.
Box 2219, 2045 Mills Rd., Sidney, BC Canada
+1 403 750 2439 Fax: +1 250 656 4789
jgreen@axys.net

The oil and gas industry in British Columbia, Canada, is rapidly emerging as a major supplier to North American energy markets. This growth has presented challenges to the management of effects on the environment and on traditional land use by aboriginal peoples, especially due to the exploration and production of natural gas in the northeast region of the province.

The management of cumulative effects in this region has become a priority for provincial regulators of the energy industry, and a concern to other land users. In meeting these challenges, recent initiatives have focused on the development of strategies to understand these effects and to manage them through various approaches, such as the use of thresholds and various effects management practices. While all of these practices require industry cooperation, some are evolving that incorporate a more regional and collaborative involvement by the various participants in land and resource use and management, including industry, government, regulatory boards, the public and aboriginal people.

This paper explores these opportunities, based on the authors' direct involvement in the ongoing development of these strategies and tools to manage cumulative effects in the region. Included are best practices such as joint development plans amongst various project operators, regional access management, and pre-tenure and regional plans. These and other initiatives are described, and their contribution to the management of regional effects explained. References to case studies are made, along with a long-term forecast of how these initiatives may evolve as the energy industry expands into unconventional energy reserves (such as coal bed methane) and offshore oil and gas development. The practical limitations and opportunities of industry involvement are emphasized in consideration of the balance between industry's risk associated with capital investment and due diligence in responding to "on the ground" and strategic sustainable business practices.

Key words: *cumulative effects, cumulative effects assessment and management, oil and gas, management tools, regional planning*

INTEGRATING SOCIAL AND ENVIRONMENTAL IMPACT ASSESSMENT: A PROPOSAL

Bryan, Hobson
The University of Alabama Department of Geography
Box 870322, Tuscaloosa, AL 5487-0322 USA
+1 205 348 1950 Fax: +1 205 348 2278
hbryan@bama.ua.edu

This paper defines and explores the relationship among key areas and sub-areas of environmental impact assessment (EIA), including among others: social impact assessment, strategic environmental assessment, cumulative effects assessment, public participation. A central thesis is that trends toward proliferation of specialty areas and their segmentation are caused not only by the growth and accompanying sophistication of the impact assessment field, but by unresolved and sometimes hidden confusion and disagreement over the concept of environmental "standing" and the relationship of environmental impacts to human concerns. The author attempts conceptual clarification as a means to push the field toward integrated approaches to EIA and its related components and enhance capacity building and effective application.

USE OF OFFSHORE WIND ENERGY IN THE GERMAN NORTH AND BALTIC SEA—CLIMATE PROTECTION VERSUS BIODIVERSITY?

Köppel, Johann
Technical University Berlin
Institute for Landscape Architecture and Environmental Planning
Department of Landscape Conservation Support Planning/ Environmental Impact Assessment
Sekr. FR 2-6, Franklinstr. 28/29, D-10587 Berlin, Germany
+49 30 31422344 Fax: +49 30 31423507
koeppel@ile.tu-berlin.de • www.tu-berlin.de/~lbp/

Langenheld, Alexandra
Blücherstr. 58, D-10961 Berlin, Germany
+49-30-6918665 Fax: +49 40 3603350158
Alexandra_Langenheld@web.de

The German Government has set the target of doubling the share of renewable energies by the year 2010. Energy supply should be restructured and put on a sustainable foundation. Guaranteeing a reliable energy supply, profitability for both suppliers and consumers, and the protection of the environment and resources should all be treated with the same priority.
The subject of discussion about the construction of offshore wind energy farms in the Geman North and Baltic Sea is their contribution to the climate protection. On the part of nature conservation the possible contradiction between offshore wind energy plants and the protection of biodiversity is pointed out. "The Strategy of the German Government on the use of off-shore wind energy" aims at creating the necessary preconditions on the supply side that will allow for a rapid construction of offshore wind farms. Furthermore it envisions to solve the existing conflicts between the protection and use of resources.
A research team, conducted by the Technical University Berlin, worked on soltutions for adapting the environmental instruments providing the precautionary principle as well as the impact assessment itself to the licensing procedure of offshore wind energy plants. The aim of the project was the development of these instruments in such a way that an effective application as well as an optimised consideration of the needs of the marine environment are supported.

The presentation focuses on the evaluation of the significance of impacts on the marine environment due to offshore wind farms as the most important step subject to the EIA. As an example the findings relevant for evaluating the "harassment and/ or displacement of harbour porpoises due to construction noise" as well as the "displacement or collision of seabirds" are illustrated.

Key words: *renewable energies, offshore wind energy, resources, climate protection, biodiversity, precautionary principle, environmental instruments, impact assessment, EIA, evaluation of the significance of impacts, marine environment*

EVALUATING AND COMMUNICATING IMPACT SIGNIFICANCE IN EIA: A FUZZY SET APPROACH TO ARTICULATING STAKEHOLDER PERSPECTIVES

Wood, Graham
Impacts Assessment Unit
Department of Planning
Oxford Brookes University
Gipsy Lane, Headington, Oxford OX3 0BP UK
+44(0)1865 483942 Fax: +44(0)1865 483559
gjwood@brookes.acuk • www.brookes.ac.uk/iau

Becker, Julia
Impacts Assessment Unit
Department of Planning
Oxford Brookes University
+44(0)1865 483882 Fax: +44(0)1865 483559
jbecker@brookes.ac.uk

Decisions that surround the evaluation of the significance of environmental impacts are a critical component of EIA, with implications for all stages in the process. Despite this, significance evaluation arguably remains one of the most complex and least understood of EIA activities, involving a combination of technical "scientific" approaches to appraisal situated within a political decision making arena, characterised by value judgements and case-specific interpretations.

EIAs typically use natural language terms, e.g., "slight," "moderate," or "substantial" to communicate impact

significance. Whilst pragmatic, this raises the problem of lexical uncertainty, and such terms in themselves may be contested - one person's "slight" impact is another's "substantial." Secondly, ES authors could manipulate the definitions of impact significance to their advantage. Thirdly, sharp 'black and white' boundaries between impact categories are often used that do not reflect the actual 'shades of Grey,' e.g., 100 traffic movements are a "slight" impact but 101 movements are classed as "moderate."

Focussing on noise and visual effects for a live windfarm EIA, this paper explores the use of fuzzy set theory for establishing and communicating impact significance across different stakeholder groups. Research participants were exposed to a series of (i) computer-animated photomontages and (ii) various sound recordings of actual similar wind-turbines in operation, and were asked to grade the extent to which the impact matched their assessment of a "slight" impact, a "moderate" impact, etc. Fuzzy sets representing these linguistic terms were subsequently calibrated against relevant corresponding continuous variables (e.g., dB(A) for noise) to 'map' the boundaries of impact significance.

Differences in stakeholder assessments of impact significance are outlined, before considering how individual stakeholder fuzzy sets may be used to define significance thresholds to guide the EIA process. Finally a critical evaluation of the approach is provided and its potential wider applicability considered.

Research is funded by the UK Economic & Social Research Council (ESRC) with additional support from the Office of the Deputy Prime Minister.

Key words: *impact significance, fuzzy sets, stakeholder perspectives, noise, visual impacts, windfarms*

HOW URBAN ENVIRONMENTS CAN CONTRIBUTE TO INCREASED PHYSICAL ACTIVITY

Penris, Manon
RIVM
PO Box 1, 3720 BA Bilthoven, The Netherlands
+31 30 2743673 Fax: +31 30 2744450
manon.penris@rivm.nl • www.rivm.nl

Alleman, Teresa
RIVM
+31 30 2743247 Fax: +31 30 2744450
teresa.alleman@rivm.nl

den Broeder, Lea
RIVM
+31 30 2742735 Fax: +31 30 2744450
lea.den.broeder@rivm.nl

Put, Gerard Varela
RIVM
+31 30 2743151 Fax: +31 30 2744450
gerard.varela.put@rivm.nl

The city of Voorhout is a rapidly growing city in the Netherlands. During the coming years two new districts will be built and the number of inhabitants will increase from 14.000 in 2002 to 20.000 in 2010. The local authority is of the opinion that health should be taken into account in building the two districts. The local authority has recently published a Memorandum on Public Health Policy in which physical activity is one of the spearheads. Physical inactivity is associated with a high blood pressure, coronary heart disease and diabetes mellitus. Studies show that incorporating physical activity in day-to-day routines is the most effective way to maintain or increase it. A living environment which makes physical activity appealing is therefore important. A safe environment is an important condition for physical activity. In cooperation with the municipality of Voorhout we developed a manual for building districts which enhance safety and physical activity. The manual contains points of interests for healthy neighbourhoods. Furthermore the manual gives a step-by-step plan for the use of the manual in the municipality. To draw up a manual that can and will be succesfully used in the municipalities:

- we make an analysis of the administrative context in which the manual is used
- we conduct a process evaluation in order to get information for improving the manual
- and last but not least we conduct an indepth stakeholder analysis

Key words: *health impact sssessment, living environment*

SUSTAINABILITY IMPACT ASSESSMENT OF WORLD TRADE NEGOTIATIONS: CURRENT PRACTICE AND LESSONS FOR FURTHER DEVELOPMENT

Kirkpatrick, Colin
Institute for Development Policy & Management
University of Manchester Precinct Centre
Oxford Road, Manchester
Greater Manchester M13 9QH UK
+44 0161 275 2808 +44 0161 275 0423
colin.kirkpatrick@man.ac.uk

George, Clive
Institute for Development Policy & Management
University of Manchester Precinct Centre
+44 0161 275 0812 Fax: +44 0161 275 0423
clive.george@man.ac.uk

Sustainability Impact Assessment (SIA) is an increasingly accepted form of strategic impact assessment, and has recently been adopted, for example, as the preferred method of ex ante policy assessment in the European Community. A methodology for SIA for application to

international trade policy measures was developed by IDPM in 1999, and since then has been used in conducting an

ongoing SIA study of the WTO trade negotiations agenda. This paper will review the past four years' experience in carrying out SIA of trade policy, and will identify the main difficulties and challenges that have arisen in its application. The main lessons for the further development of the methodology will then be discussed.

INCREASING CITIZEN INVOLVEMENT IN SUSTAINABILITY-CENTRED ENVIRONMENTAL ASSESSMENT FOLLOW-UP

Hunsberger, Carol
University of Waterloo
200 University Ave., Environmental Studies Building
Waterloo, ON N2L 3G1Canada
+1 519 725 8669 Fax: +1 519 746 0292
cahunsbe@fes.uwaterloo.ca

Gibson, Robert
University of Waterloo
+1 519 888 4567 ext. 3402 Fax: +1 519 746 0292
rbgibson@watserv1.uwaterloo.ca

Wismer, Susan
University of Waterloo
200 University Ave., Environmental Studies Building
+1 519 888 4567 ext. 5795 Fax: +1 519 746 0292
skwismer@fes.uwaterloo.ca

In Canada, many project proponents and planners in the public and private sectors are required to forecast and minimize the adverse environmental effects of their undertakings. However, environmental assessments have traditionally been weak in the areas of planning and conducting effective monitoring, encouraging public participation, integrating social and environmental considerations, encouraging environmental rehabilitation and enhancement, and examining cumulative effects of multiple projects. This paper attempts to address these deficiencies by drawing from theory and practice in the areas of citizen monitoring, sustainable livelihoods, and local knowledge. Based on case study research in several regions of Canada, this discussion compares the outcomes of particularly innovative initiatives with conventional arguments for increasing local involvement in environmental assessments. Opportunities and challenges are presented with respect to integrating local and conventional (or scientific) knowledge systems, addressing concerns about credibility and bias between citizens and project proponents, and contributing to broader sustainability goals such as increased stewardship and civility. Potential benefits of broadening the temporal, geographic, and topical scope of environmental assessment follow-up activities are also discussed. Finally, some ideas for coordinating and funding integrated and participatory monitoring programs are suggested. The resulting recommendations call for a dramatically different approach to follow-up activities on the part of private and public project proponents, as well as novel thinking for environmental assessment practitioners.

Key words: *environmental assessment follow-up, citizen participation, integrated approaches*

THE KANANASKIS 2002 G8 SUMMIT - A CASE STUDY IN STRATEGIC ASSESSMENT AND SUSTAINABLE DEVELOPMENT IN A PROTECTED AREA

Leeson, Bruce F.
Western Canada Service Centre
Parks Canada Agency
13th Floor 635 8th Ave. S.W.
Calgary, AB T2P 3M3 Canada
+1 403 292 4438 Fax: +1 403 292 4404
bruce.leeson@pc.g c.ca

When Canada's Prime Minister announced the 2002 G8 Summit would be held in Kananaskis Country in Alberta, immediate concern arose for the potential adverse environmental impact that might result to this cherished area. Recent meetings of world leaders had been beset by violent protest disturbances that damaged local environments egg. Seattle, and this concern greatly intensified after the New York terrorist attacks on 11 September 2001. Security arrangements involved about 9000 Canadian soldiers and police officers with terrorism response and riot enforcement capability -- the largest peacetime security operation ever undertaken in Canada.

For the first time ever, a Director of Environmental Affairs was appointed to participate in planning the G8 Summit 2002. Canada's Department of Foreign Affairs and International Trade prepared a Strategic Environmental Assessment of the overall project to identify sensitive species, spaces and times and to inform all other planning.

The G8 Kananaskis 2002 Summit environmental program had five major components:

1. Environmental Planning and Impact Assessment
2. EnviroSafe Training
3. Green Meetings
4. Outreach and Consultation - Envirostakeholders
5. Environmental Legacy

About 350 G8 staff members were individually informed and trained regarding their personal responsibilities to make good stewardship choices to achieve a Green Meeting. An EnviroSafe program instructed several thousand soldiers and officers about how to conduct their outdoor duties in a manner that kept them safe from harm by natural hazards, and conversely, how to safeguard the environment from their presence and activities. The public stakeholder outreach program presented G8's stewardship commitment and techniques by way of dozens of lectures, a G8 website and a news publication mailed monthly to 33,000 addresses. Both tangible and intangible benefits were realized - mainly that the natural and social environment of Kananaskis Country was protected - there is virtually no residual evidence the meeting ever took place.

Key words: *protected recreation area, world leaders, riots and terrorism, strategic assessment, sustainable development*

SEA AND SAEMANGEUM RECLAMATION PROJECT

Lee, Sang Hoon
Department of Environmental Engineering
The University of Suwon
P.O.Box 77, Suwon
Kyonggi-Do 440-600 Republic of Korea
+82 31 220 2148 Fax: +82 31 220 2533
muusim@suwon.ac.kr

Kim, Im Soon
Graduate School of Environmental Studies
Kwangwoon University
447-1 Wolgye-Dong Nowon-Gu
Seoul 139-701 Republic of Korea
+82 2 2040 6135 Fax: +82 2 2040 6135
imsoon99@hanmail.net

Han, Sang Wook
Graduate School of Environmental Studies
Kwangwoon University
+82 2 940 5086 Fax: +82 2 917 6147
swhan@hanmail.net

Kim, Yoon Shin
Hanyang University
17 Hamgdang-dong, Seongdong-Gu
Seoul 1330791 Republic of Korea
+82 2 2290 0692 Fax: +82 2 2290 0692
yoonshin@hanyang.ac.kr

Saemangeum reclamation project, which aims to build 33-kilometer long sea-dike, the longest in reclamation history, in the west coast of Korean peninsula was initiated in 1987 as a presidential-election campaign pledge. The economic feasibility and environmental impact affecting the fishery and tidal-land were questioned from the very beginning of the project. The protests from the environmental groups to stop the project have partly succeeded twice, first in 2000 and second in 2003. Now the sea-dike is almost completed except for two narrow waterways, and the inside tidal-land is deteriorating. The EIA was carried out in 1987 very briefly without considering the importance of tidal-land contributing to fishery and purification of water pollutants.

SEA is not included in the process of EIA in the present environmental law system in Korea. This paper presumes that SEA is compulsory and reviews the reclamation project, following the stepwise processes of SEA. It was found out that the budgetary waste and public division surrounding the reclamation project might have been evaded, if this SEA had been tried before the project started.

Key words: *strategic environmental assessment, reclamation project*

A SIGNIFICANCE OF STRATEGIC ENVIRONMENTAL ASSESSMENT FOR DAM CONSTRUCTION IN KOREA

Lee, Sang-Don
Ewha Womans University
SeoDaeMun-Ku DaeHyun-Dong 11-1
Dept of Environmental Science and Engineering
Seoul 120-750 Korea
+82 2 3277 3545 Fax: +82 2 3277 3545
lsd@ewha.ac.kr

Chun, Seung-Hoon
Kyung-won University
Bureau of Urban Planning & Landscape Architecture
Sung Nam, Korea
chunsh@mail.kyungwon.ac.kr

Dam construction has faced serious concerns due to large scale damage to natural ecosystem. In the process of dam construction, Environment Impact Assessment (EIA) requires site preparation, justification of development, and counter-plan of environmental impact that should be considered in the upper administrative scheme. This delays the dam project, and eventually hinders proper and effective management. This study aims at an alternative plan that will eventually improve the evaluation process of EIA and pre-EIA of dam construction. For a dam construction there are four administrative steps: 1) Long-term plan for dam construction, 2) Designation of future dam construction site, 3) Basic plan for dam construction, and 4) dam construction. For a long-term plan for dam construction, an environmental consideration is minimal due to lack of pre-EIA consultation. In the 2) and 3) processes even though environmental consultation is legally secured, site justification and alternatives are not seriously considered. However, in the EIA designation site and basic plan of construction, including detailed evaluation of environmental impact, are considered. A clear distinction between pre-EIA and EIA is necessary. This resulted in large conflict between developers and conservationists, and often failed to harmonize ecosystem destruction and opinion of stakeholder. To solve these problems, it is necessary to adopt Strategic Environment Assessment (SEA) that enables considering environmental impact from the beginning stage of policy formation for individual projects. Strategic Environment Assessment allows us to overcome the difficulties of site selection by absorbing opinion of stakeholder, and harmonize the uppermost limit of EIA that considers alternative plan and mitigation. Second, SEA enables helping development sustainable by evaluating cumulative impact on a large scale. Consequently, we should bring SEA to solve the problems of pre-EIA and EIA by changing legislation, system and management.

Key words: *strategic environment assessment, dam construction, environment impact assessment, Korea*

THE BIODIVERSITY ASSESSMENT FRAMEWORK: BIODIVERSITY AND CORPORATE SOCIAL RESPONSIBILITY

Slootweg, Roel
SevS Natural and Human Environment Consultants
Juffermansstraat 5, 2341 JH Oegstgeest, The Netherlands
+31 71 5283858 Fax: +31 71 5283859
SevS@SevS.nl

The Netherlands Ministry of Environment initiated the development of an "assessment framework for biodiversity." The objectives of this project are to be better able to assess the quality of the numerously appearing codes, labels, methods, etc. (benchmarking) and to invite the private sector to transform their policies and operations towards more sustainable practices (economic, environmental and social = PPP) by providing tools to companies that have corporate social responsibility on the agenda. The framework is a generic guidance model for the private sector on how to better integrate biodiversity considerations into day to day business operations. It provides an overview of the steps needed to put biodiversity on the agenda, taking into account the objectives of the international Convention on Biological Diversity (thus including conservation ánd sustainable/equitable use of biodiversity). The framework makes use of CBD's Ecosystem Approach, it's draft guidelines for sustainable use of biodiversity and it's guidelines for biodiversity in EIA and SEA (prepared by IAIA's biodiversity section). Companies, sector organizations and the like can use this guidance framework to develop their own company or sector specific tools. The framework contains an initial set of task-oriented modules for analysis of products and production processes and for eco-labeling.

A number of Netherlands-based multinationals intend to apply the framework to some of their activities on a pilot basis. At the time of writing the framework is being finalised and real-life follow up pilots are being identified.

Key words: *biodiversity, corporate social responsibility, private sector, CBD*

IMPLEMENTING SUSTAINABLE STRATEGIES FOR RURAL LAND USE PLANNING AND RESOURCE MANAGEMENT OF PUBLICLY OWNED ASSETS: AN ANALYSIS OF ENVIRONMENTAL ASSESSMENT SYSTEMS BEING DEVELOPED BY THE BRITISH COLUMBIA MINISTRY OF SUSTAINABLE RESOURCE MANAGEMENT

Curry, John
The School of Environmental Planning
University of Northern British Columbia
3333 University Way, Prince George, BC Canada
+1 250 960 5837 Fax: +1250 960 5544
curryj@unbc.ca

Jackson, Tony
The Geddes Institute for Planning Research
School of Town and Regional Planning
University of Dundee
Dundee DD1 4HT Scotland UK
+44 1382 345239 Fax: +44 1382 204234
a.a.jackson@dundee.ac.uk

The paper examines efforts to develop a land use planning and resource management system for rural and remote regions of northern British Columbia (BC), Canada, that incorporates sustainability precepts and environmental assessment procedures. Since their election in 2001, the BC Liberal government has undertaken a comprehensive review and re-organization of the delivery of provincial government services. In his 2003/4 to 2005/6 Service Plan, Premier Gordon Campbell articulates a new sustainability vision for the province: A strong and vibrant provincial economy; A supportive social fabric; and Safe, healthy communities and a sustainable environment. Within the sphere of a sustainable environment, the new Ministry of Sustainable Resource Management (MSRM) is responsible for strategic plans and policies regarding the sustainable management of Crown land and water resources. The goals of the new MSRM include: the sustainable economic development of land and resources; effective delivery of integrated, science-based land, resource and geographic information; and sound governance of land and resource management. The MSRM is taking up these new responsibilities within an environment of limited staff resources, conflicting land resource users, and a poorly performing provincial economy. The paper reviews the evolution of this land use planning and resource management system, identifies opportunities to improve the system by introducing strategic EIA processes, and delineates lessons-learned over the past three years. One unique element of the planning process is involving the participation of First Nations. The authors encourage an interactive session, with the audience sharing their experiences in developing environmental assessment methodology for rural land use planning systems that embrace indigenous land rights.

Key words: *rural land use planning system, natural resource management, environmental assessment, systems*

IMPACT ASSESSMENT OF INDUSTRIAL PROJECTS IN QUÉBEC: WHAT THE LAST EIGHT YEARS HAVE TAUGHT US / L'ÉVALUATION ENVIRONNEMENTALE DES PROJETS INDUSTRIELS AU QUÉBEC : QU'AVONS-NOUS APPRIS EN HUIT ANS ?

Loiselle, Renée
Ministère de l'Environnement du Québec
675, boul. René-Lévesque Est 6e étage, boîte 83
Québec G1R 5V7Canada
+1 418 521 3933 Fax: +1 418 644 8222
renee.loiselle@menv.gouv.qc.ca

In February 1996, following a modification of the regulation, major industrial projects, mines and gas pipelines were subjected to the Southern Québec environmental assessment procedure. Prior to that date, authorization of industrial projects did not involve public participation. Since then, few projects have gone through our procedure, which

is aimed at the very large industry. The process is generally perceived by new proponents as time consuming, and, since industrialists are notoriously shy about revealing their plans in advance, many make use of legal loopholes or dimension their project so it is under the threshold at which it would become subject to the procedure. However, the proponents whose projects underwent environmental impact assessment found that the process enabled them to realize a better impact statement and, ultimately, a project that was more easily integrated to its biophysical and social environment. We will see how this modification in the approval process of major industrial projects has changed the assessment of these projects. With public participation, proponents have felt the pressure to be more open and straight-forward about their projects. We have learned that public involvement plays an important role in the decision-making process, encouraging on industrial proponents to install the latest treatment technologies, establishing the first links between the industry and its future neighbours and even helping local contractors in obtaining building contracts. The role of the different actors in the procedure will be discussed: the proponent, the agent of the environmental authority, the neighbouring population, the environmental groups and the media.

Key words: *public perception, industrial projects*

ENVIRONMENTAL MANAGEMENT TOOLS TO IMPROVE THEORY AND PRACTICE OF EIA

Thompson, Dixon
Faculty of Environmental Design
University of Calgary
Calgary, AB T2N 1N4 Canada
and Haskayne School of Business
+1 403 220 3625 Fax: +1 403 284 4399
dixont@telus.net

EIA is well developed in theory and practice and is widely used. However, while there are still improvements that can be made within EIA (Cumulative Assessments, SEA, SIA), EIAs can be improved by using other environmental management tools to support and enhance the EIA. EIAs will be improved if the institutions and corporations involved use an Environmental Management System. This paper will discuss a set of 22 environmental management tools and a subset of 11 tools that can be used to enhance EIAs or appear to hold the most potential to do so. Strategic Environmental Management and Planning (including governance) sets goals and objectives and guides the institutions involved. Good governance is very important. Environmental Policies stipulate the actions that will be taken to improve environmental performance. Environmental Auditing, after the EIA ensures that goals and objectives are being met. Education and Training are essential for effective implementation. Risk Management provides assurance to stakeholders. Environmental Indicators and Environmental Reporting (with external verification) prove to stakeholders that goals and objectives were met. Environmental Accounting and Life Cycle Assessment identify costs and benefits over the life of the project. Environmental Communications is essential to keep stakeholders informed. Purchasing Guidelines reduce upstream impacts. The roles, or potential roles for these tools in improving the effectiveness and efficiency of EIAs will be discussed. Some practitioners advocate expanding EIA to include the functions of some of the tools listed above. The folly of trying to make one tool do everything - the Swiss army knife approach - is that it may do many things, but may not do them well. Therefore, careful refinements of EIA remain important for continual improvement of that specific tool. However, using a set of specifically designed and increasingly standardized tools will produce better results than the Swiss army knife approach.

Key words: *environmental management systems, environmental management tools, auditing, life cycle assessment, environmental indicators and reporting, external verification, governance*

DEVELOPING INDICATORS FOR MONITORING SUSTAINABLE TRANSPORT AND MOBILITY

van Grol, Rik
RAND Europe
Newtonweg 1, Leiden, Zuid Holland
2333 CP The Netherlands
+31 71 5245046 Fax: +31 71 6245191
vangrol@rand.org • www.rand.org

Walker, Warren
RAND Europe

Ahvenharju, Sanna
Gaia Group
Turku, Finland

Arend, Michal
Econcept
Zürich, Switzerland

De Tommas, Roberto
Synergo
Zürich, Switzerland

Röhling, Wolfgang
Kessel + Partner
Freiburg, Germany

Rahman, S. Adnan
RAND Europe
Leiden, the Netherlands

Sustainable development requires a balance between (1) the desire for a clean environment and the welfare of future generations and (2) the desire for economic growth and mobility, with concomitant increases in transport demand and use of fossil fuels. Policymakers have to accommodate these conflicting desires by balancing the positive and negative impacts of transport. SUMMA (SUstainable Mobility, policy Measures and Assessment) is a project sponsored by

the European Commission (EC). Among the objectives of SUMMA are to define and operationalize the concept of sustainable transport and mobility, to define a set of outcomes from the transport system that can help policymakers monitor progress towards sustainable transport and mobility, and to assess policies designed to achieve this objective. Quite often "outcomes of interest" (e.g., air pollution) cannot be directly observed. Related outcome indicators are therefore defined that can be measured or estimated (e.g., emissions). Determining the outcomes of interest and the associated outcome indicators is the subject of this paper. Quite often the outcomes are limited to environmental impacts and the indicators are influenced by data availability. SUMMA covers all three dimensions of sustainable development (economic, environmental, and the often neglected social dimension) and the impact of the transport system on them. The result is a much more complete list of outcomes of interest and associated indicators, some of which might not be measurable (yet). The idea is that data for these indicators might be able to be collected in the future. In fact, the results of the project might stimulate the collection of some of these data. This paper describes how we related the EC's definition of sustainable transport and mobility to outcomes of interest and presents the set of outcome indicators that we designed for each of the outcomes.

Key words: *indicators, sustainability, transportation*

COURSIER DAM DECOMMISSIONING AND ENVIRONMENTAL RESTORATION

Lamont, Carol
B. C. Hydro
Engineering Services
6911 Southpoint Drive, Burnaby, BC V3N 4X8 Canada
+1 604 528 1877 Fax: +1 604 528 2940
carol.lamont@bchydro.com

Coursier Dam was located in an isolated mountain valley in the Monashee Mountains, approximately 30 km south of Revelstoke, B.C., Canada. It was a 19 m high earth fill dam located at the outlet of Coursier Lake Reservoir which provided upstream storage for the 8 megawatt B.C. Hydro Walter Hardman Hydroelectric Generating Station. Coursier Dam had a long history of dam safety incidents and remedial repairs. These deficiencies included piping and seepage at high reservoir levels, elevating the potential for Coursier Dam to fail. B.C. Hydro considered a full range of risk control options, ranging from a comprehensive rebuild to decommissioning. As a result of these analyses, B.C. Hydro decommissioned the dam in 2003 to eliminate the risk of dam failure. The decommissioning consisted of excavating a notch through the center of the earth fill dam and moving approximately 100,000 cubic meters of material. The environmental assessment process involved consultation and cooperation with First Nations, public and natural resource regulatory agencies. The restoration objective was to return the area to its natural state. An outflow stream channel was designed and constructed at the approximate location of the original creek bed and Coursier Lake was returned to its original historic elevation, reducing the surface area from approximately 200 ha to 40 ha. Revegetation plans include riparian planting and reforestation to return the previously inundated area to its naturally vegetated condition. This paper will discuss the environmental impact assessment and planning, environmental management and protection during decommissioning and the post decommissioning environmental monitoring program.

Key words: *dam decommissioning, environmental assessment, environmental management*

IMPROVING EIA PROCESSES IN DEVELOPING COUNTRIES: CASE STUDY OF THE PERUVIAN MINING INDUSTRY

Holden, Wil
Department of Geography
University of Calgary
2500 University Drive NW, Calgary, AB T2N 1N4 Canada
+1 403 220 5584 Fax: +1 403 282 6561
wnholden@ucalgary.ca

Garcia, Percy
Resources & Environment
Haskayne School of Business
University of Calgary
2500 University Drive NW, Calgary, AB T2N 1N4 Canada
+1 403 210 3028 Fax: +1 403 289 6205
pgarcia@ucalgary.ca

Thompson, Dixon
Faculty of Environmental Design
University of Calgary
Calgary, AB T2N 1N4 Canada
and Haskayne School of Business
+1 403 220 3625 Fax: +1 403 284 4399
dixont@telus.net

During the 1990s, as Peru regained political stability following the suppression of the Shining Path terrorist movement and implementation of neo-liberal policies, mining firms began to move to Peru. Mining has unique and substantial potential for environmental degradation. However, adverse impacts can be controlled through effective EIA. Peru has reasonably well developed, substantive EIA legislation. However, as with EIA processes in most countries, the Peruvian EIA processes require improvements. Five specific areas requiring improvement are discussed: a) provisions for cumulative impact assessment; b) provisions for public participation; c) the administration of Peru's EIA regime; d) separation of the responsibility for EIAs from the Ministry of Energy and Mines, which is responsible for promotion of mining; and e) building capacity in Peruvian universities to produce the EIA expertise required. These improvements would enhance the contribution of mining to Peru's sustainable development. Ross and Thompson provided guidelines to conduct a sound EIA, including cumulative effects assessment, public involvement, and human resources. Creasey analyzed the

role of the government, in terms of policy development, to reduce the incremental effect of individual projects. Gordon outlined the importance of capacity building within educational institutions as key element to conduct EIA. This paper analyzes the Peruvian EIA regime that applies to mining projects and explores ways to improve it. The six main findings are: a) capacity building within educational institutions play important roles to improve the EIA process; b) enhance capacity and requirements for cumulative impact assessment, c) EIA processes in Peru will be improved only through improved human resources and support for them within government organizations; d) separation of responsibility for mining EIAs from the Ministry of Energy and Mines to improve governance; e) improved public participation by both mining companies and government organizations; and f) requirements for post EIA follow up - monitoring, auditing, and reporting.

Key words: *Peru, mining, improvements to EIA, public participation, governance, EIA follow up, cumulative impact assessment*

ENVIRONMENTAL IMPACT ASSESSMENT AS MANAGEMENT TOOL FOR PROTECTED AREAS IN CANADA AND MEXICO

Mendoza-Duran, Angeles
Faculty of Environmental Design
University of Calgary
2500 University Drive, NW, Calgary, AB T2N 1N4 Canada
+1 403 585 5525 Fax: +1 403 289 6205
dmdlmend@ucalgary.ca • angelesmd@yahoo.com

Environmental assessments are a planning and management tool that allows the examination of the likely impacts that development projects may have on the human or biophysical environment. Although Environmental Impact Assessments (EIA) were introduced into the environmental legislation of various countries since the early 1970's, it was not until 1988 that EIA was introduced into the first Mexican Environmental Law (Ley del Equilibrio Ecologico y Proteccion al Ambiente). This paper is divided in two sections. The first section compares the current legal instruments that regulate EIA practice both in Mexico and Canada. It presents the different definitions of environmental impact and the types of assessments recognized in each country. The second section deepens into how cumulative impact assessments are being used as a planning and management tool for protected areas in both countries. In Canada, evaluating cumulative effects has been a requirement for more than 10 years. The Canadian Environmental Assessment Act requires evaluating the cumulative effects that are likely to result from a project in combination with other present or foreseeable projects or activities. However, cumulative effects are not considered in the Mexican Environmental Law and the concept was recently introduced into EIA regulations in 2002. The paper presents the results of interviews with protected area managers and a revision of environmental assessment reports of public and private development proposal that affect protected areas in Mexico, and provides recommendations for improving the usefulness of EIA and Cumulative Impact Assessment as a planning and management tool for protected areas in this country.

Key words: *environmental impact assessment, cumulative impact assessment, legislation, protected areas, Mexico, Canada*

AN INCLUSIVE FRAMEWORK FOR ENVIRONMENTAL IMPACT ASSESSMENT

Gurney, Jane
University of Guelph
Rural Planning and Development SEDRD
LA Building, Guelph, ON N1G 2W1 Canada
+1 519 824 4120 Fax: +1 519 827 9549
jgurney@uoguelph.ca

Yap, Nonita
University of Guelph
Rural Planning and Development SEDRD
LA Building, Room 122
+1 519 824 4120 Fax: +1 519 767 1686
nyap@rpd.uoguelph.ca
www.yesa.com

Human impact assessment is an area of active interest among impact assessment practitioners and researchers, and it is increasingly broadening in scope and application. Understanding the links between human health and the environment is relatively easily done, provided the concept of health is limited to only physical well being. However, health has been defined by the World Health Organization not as the mere absence of disease but as "a state of complete physical, mental, and social well being." This broader definition implies recognition of the many determinants of human health—including the state of the economy, family harmony, community coherence, cultural and leisure activities. This understanding of the concept of human health is being adopted by many governments, and incorporated into impact assessments. Clearly, the costs and benefits of development activities, in terms of human health, should be part of the impact assessment process. The link between health and the environment is not at issue; the challenge is how to best achieve that integration given the legal and institutional basis of the Canadian Environmental Assessment Act. There are cost implications and methodological challenges, and there may also be policy and political ramifications. We propose a framework for impact assessment that will incorporate a holistic concept of human health and impacts, and that will address these challenges. The framework will be applied in the Canadian context, and will be adjusted to the different levels of assessment as defined in the Canadian Environmental Assessment Act, specifically with regard to scope of assessments, identifying and scoping health issues, and public participation requirements.

Key words: *human health, impact assessment, Canada*

A COMPARATIVE STUDY OF ENVIRONMENTAL IMPACT ASSESSMENT OF DIFFERENT TYPES OF HYDROPOWER PLANTS. (FEASIBILITY ASSESSMENT OF PUMPED STORAGE AS AN ALTERNATIVE TO OTHER TYPES OF HYDROPOWER PLANTS WITH AN EMPHASIS ON PRIVATE OWNERSHIP ISSUES)

Najmi, Nader; Zarnekabi, Mohammad Reza
Moshanir Company
P.O.Box 19395-4691, Tehran, Iran
+98 21 8889126 Fax: +98 21 8775010
n.najmi@moshanir.com
Zarnekabi@hotmail.com

Different types of hydropower plants are being utilized in the country's power sector taking environmental, financial, technological and institutional aspects into policy making and planning considerations. Reservoirs, flow storage and pumped storage are identified as three operational types of hydropower plants that generate economically valued electricity during the pick hours. These power plants have different environmental impacts depending on their technical specifications and the environmental setting they are located in. In this study six hydropower plants of three types were selected and their different aspects of environmental impacts were analyzed. Comparing the environmental impacts of first type (Karoon 5, Karoon 4, Karoon 3, Roodbar Lorestan reservoirs) and the second type (Godar Landar) with the third type (. Siah Bisheh) shows that the negative environmental effects of the first and second types of hydropower plants are much more diverse, frequent and significant than those of the third type, which is basically due to high volume of reservoirs and the vast affected areas of first and second types.

The change in reverie ecosystems, altering the natural land forms and consequently inundation of lands and properties owned by the local settlers are considered as the most significant impacts of the power plants of first and second types. Taking theses impacts in mind, the use of pumped storage as an alternative to the first and second types of hydropower plants in the countries with the capacity of power generation during the non-pick hours, could be a proper solution to saving the potential affected areas and prevent emergence of any likely conflicts due to the lose of private lands. A network of pumped storage can also be utilized in a basin, which significantly can reduce most of the negative impacts of hydro power plants of first and second types. In this paper the environmental impacts of three types of hydro power plants are compared to assess the feasibility of replacing the first and second types by pumped storage plants.

Key words: *environmental impact assessment, pump storage, private ownership, hydropower plants, geographical potentials*

INTEGRATING CLIMATE CHANGE CONSIDERATIONS INTO ENVIRONMENTAL ASSESSMENTS OF HYDRO-ELECTRIC POWER PROJECTS IN EASTERN AND NORTHERN CANADA

Singh, Bhawan; Gagnon, Sébastien; Davey, Nicklaus; André, Pierre
Département de géographie
Université de Montréal
Case postale 6128, succursale Centre-ville
Montréal, QC H3C 3J7 Canada
+1 514 343 8040 Fax: +1 514 343 8008
bhawan.singh@umontreal.ca

Roy, Luc; Weyman, Steven
Hydro-Québec
Unité Conception des aménagements de production
Hydraulique et géotechnique
855, Ste-Catherine Est, 12e étage
Montréal (Québec) H2L 4P5 Canada

Rousselle, Jean
Département des génies civil, géologique et des mines
École Polytechnique de Montréal
Case postale 6079, succursale Centre-ville
Montréal (Québec) H3C 3A7 Canada

This research project investigated the merits and justification of whether greenhouse gas (GHG) climate change considerations should be integrated into environmental impacts assessments of hydro-electric projects in the north and east of Canada. To this end, research was conducted on basin hydrology and river flow for several Canadian drainage basins in northern Manitoba (Grass River), Newfoundland-and-Labrador (Eagle River) and Québec (Grande-Baleine, Vermillon and Sainte-Marguerite), for two time slices, one current (1961-1990) and one future (2040-2069). The methodologies used consisted of coupling downscaled temperature and precipitation outputs of two atmosphere-ocean general circulation models (AOGCM), one Canadian (CGCM 1) and the other British (HadCM3) to the Thornthwaite water budget (Grande-Baleine, Grass River, Eagle River) and the Streamflow Synthesis and Reservoir Regulation (SSARR) hydrological model (Grande-Baleine, Vermillon and Sainte-Marguerite). The results show that in general, the timing of peak spring discharge occurs earlier by a few days to more than a month, changes in total discharge volume, phase shifts of river discharge and increased inter-annual variability of discharge, depending on river basin and climate scenario. However, given the high level of uncertainty of climate scenarios, it is judged that it may be premature to integrate climate change considerations into environmental assessments of hydro-electric projects. All the same, climate change and variability may significantly influence the practice of environmental impacts assessments.

Key words: *climate change, environmental assessment, hydro power projects, streamflow, Canada*

PROCESSING OF ENVIRONMENTAL FUZZY INFORMATION (PEFI)

Zakarya, Driss
Faculty of Science and Technology
BP146 Mohammadia , Mohammadia 23000 Morocco
+21261205057 Fax: +21237686935
zakaryadriss@yahoo.fr

Boulejiouch, Jaafar
Départment of Environment
Bd Abtal, Rabat 10000 Morocco
dpe@minenv.ma

Lofti, Rabiaâ

Actually, in developed countries as well as in the others, environmental impact assessment becomes of great interest. Many factors lead to such interest, like sustainable development, economy, pure ecology, etc. In any case of environmental impact assessment (EIA, EISA, ...) information quality and its processing is the most important factor. This is the case in the strategic environmental impact assessment studies where the information available or estimated is often fuzzy. To solve such problem, we developed a new technique for data possessing. This technique will be applied to a case study of SEIA for a program and comparison of environmental impacts of industrial projects in Morocco. The benefits of our approach are evaluation of environmental impact for two projects on the basis of the information available and about the same item, i.e., water, air, soil. Naturally, if one try to compare projects on the basis of all aspects together, introduction of a contribution parameter for each item is suitable. Such contribution is chosen on the basis of importance given to the item, its hierarchy, etc. Let's consider two different programs (or industrial projects), P1 and P2 for which the investment costs are C1 and C2 respectively. Such projects also will have environmental impacts, that we illustrate with and biological pollutions, given here as example. The global environmental impact or environmental disturb of such program is given by comparison (Euclidean distance in the present case) of each program to the ideal one. Thus program or industrial project P2 seems to be the one having lowest environmental impact than P2.

Key words: *ecoefficiency, fuzzy data, EIA, industry, SEIA*

MEASURING SUSTAINABLE PRODUCTION

Burdick, David
Sustainable Steps
4917 SE Aldercrest Rd.
Milwaukie, Oregon 97222 USA
+1 503 654 2070 Fax: +1 503 654 2121
dwburdick@sustainablesteps.com
www.sustainablesteps.com

Section III of the Plan of Implementation from the Johannesburg's World Summit on Sustainable Development 2002 calls for the development of a 10-year plan to accelerate the shift towards sustainable consumption and production. A necessary component of this is to insure that, at a minimum, the sum impacts from all human actions fall within earth's carrying capacity to manufacture, power and sequester these activities. Although methodologies exist to determine a sustainable and equitable maximum amount of Earth's resources per individual (the ecological footprint concept), devising a means to assign these parameters to the businesses that create these goods and services has, until now, not yet been developed.

This paper offers a preliminary method to meet this challenge through a 3-step process. Step 1 equitably allocates to an individual corporation their share of biophysical resources (land, air, water, ocean) relative to their financial contribution to world revenues. Step 2 determines a corporation's actual consumption of resources through a Life Cycle Analysis of its production, with results expressed in biophysical units of land, air, water and ocean. Step 3 compares the allocated amount of land, air, water and ocean to the organization's actual consumption of these biophysical resources to both establish a tangible sustainability goal and determine the corporation's present level of sustainable production.

Utilization of this methodology offers corporations a tool to:

- Establish a definitive goal for attaining ecological sustainability in simple and easily understood terms
- Prioritize efforts for attaining sustainability
- Realize market advantage
- Benchmark efforts
- Gain leadership recognition
- Earn credibility through measuring their part in achieving total sustainability

Key words: *sustainable development, production, corporate responsibility, footprint, carrying capacity, distance-to-target, nature's interest, Johannesburg's World Summit, sustainable consumption and production*

AN ANALYTICAL ASSESSMENT OF INCLUSION OF THE ENVIRONMENTAL AND SOCIO-ECONOMIC STRATEGIES IN THE PROCESS OF ENVIRONMENTAL IMPACT ASSESSMENT OF WATER RESOURCES AND POWER DEVELOPMENT PROJECTS

Najmi, Nader; Zarnekabi, Mohammad Reza
Moshanir Company
P.O.Box: 19395-4691, Tehran, Iran
+98 21 8889126 Fax: +98 21 8775010
n.najmi@moshanir.com
zarnekabi@hotmail.com

Chalabianlou, Reza
Ozone Layer Unit
Environmental Research Center
Pardissan Park, Hemmat Highway, Tehran, Iran
+98 21 8261116 / +98 21 4445046

Fax: +98 21 8261117
r_c_h@earthling.net

Environmental impact assessment can be defined as a process to identify and assess various positive and negative impacts of a specified project on physical, ecological as well as socio-economic settings of the affected environment. This process generally uses a system of impact evaluation and ranking/weighting for assessment purpose taking in to consideration the interactions among impacts of the project's activities, as the evaluation criteria, and the environmental setting. The evaluation system compares the impacts and their significance using a normalized system of impact categorization and with respect to a number of criteria, which in many cases are different in terms of their measurement units. Apart from technical, environmental and social aspects, which are essential components of an environmental evaluation system, different strategic approaches of the regional and/or local decision making bodies to the environmental and socio-economic impacts of a definite project is a major concern that affects the results of environmental assessments.

Experiences from environmental impact assessment of six water resource and power development projects in the country (Shamil & Neiyan Dams, Siah Bisheh pumped storage, Hormozgan, Esfahan and zanjan gas power plants, and Neka combined cycle power plant) shows that the current ranking system of impacts is not sufficient to properly balance the negative ecological/phisical and positive socio-economic impacts of the projects. This finally results in improper judgments on the environmental feasibility of the projects in question, which is mainly due to the strong importance given to the positive socio-economic effects in the regional development strategies comparing them with the negative ecological and physical impacts. On the other hand, sever negative environmental impacts are very likely to occur as a result of ineffective or inapplicable auditing, monitoring and control systems being used by the relevant authorities, which leads to irreversible environmental degradation in a long term process. This requires the country to adopt and apply appropriate methods to evaluate, weight and assess the impacts or to make necessary modifications in the existing EIA techniques and approval process. This paper aims at to analyze the existing EIA process from methodological point of view and to provide the relevant responsible authorities with recommendations to compromise and include both the environmental and socio-economic strategies in the process of preparation, evaluation and approval of environmental impact statements.

Key words: *environmental impact assessment process, strategic environmental assessment, socio-economic impacts, water management, energy development projects, regional water and energy development strategies, environmental monitoring*

AIDING THE ENVIRONMENT: DOES AusAID'S EMS HELP TO GREEN THE AID INDUSTRY?

Keen, Meg
Graduate Studies Environmental Management and Development
Asia Pacific School of Economics and Government
Australian National University
Canberra, ACT 0200 Australia
+61 0 2 6125 0556 Fax: +61 0 2 6125 8448
meg.keen@anu.edu.au

Sullivan, Marjorie
Environment Advisor
AusAID
GPO Box 887, Canberra ACT 2601 Australia
+61 0 2 6206 4289
marjorie_sullivan@ausaid.gov.au

The spread of Environmental Impact Assessment systems throughout the 'developing' world was largely stimulated by the requirements of major donor countries and multilateral agencies that made EIA a condition of aid. Since at least the eighties it has been increasingly realised that EIA has been largely seen as a one off hurdle to be 'gotten over' and not as an integral or strategic part of aid project and program management and delivery. The costs, both in human and financial terms, of unsustainable aid which degrades ecological systems, undermines social systems and imposes mounting financial costs on aid projects is unknown, but significant. In Australia, the Environmental Protection and Biodiversity Conservation (EPBC) Act requires that Australian overseas aid which may have significant impacts on the environment be referred to the Department of Environment and Heritage for assessment. This has provided an added impetus for AusAID (the national aid agency) to enact its own Environmental Management System (EMS) to ensure that the environmental impacts of aid are addressed early in the project cycle and whenever possible mitigated and managed within the Agency as part of its project cycles. The AusAID experience with the development and implementation of an EMS within an aid agency has important lessons for other donor agencies, and for countries who receive aid. The assessment framework has a number of components relevant to: contracts, environmental reporting, impact assessment, quality assurance, environmental capacity building, and environmental compliance with national and international laws and agreements. This paper will critically review AusAID's experience with implementing an EMS, and the lessons for the aid industry.

Key words: *environmental management systems (EMS), environmental aid, environmental impact assessment (EIA) project cycle, environmental governance*

SOCIAL IMPACT ASSESSMENT IN THE MAHAKAM DELTA

Morillon, Anne; Lafay, Philippe
2 place de la Coupole, La Défense 6
Bureau 11 G 35, 92078 Paris La Défense Cedex-France
philippe.lafay@total.com
anne.morillon@total.com

Les découvertes d'huile et de gaz faites dans les années 70 par la compagnie Total ont conduit à lancer des développements industriels pour des productions actuelles de l'ordre de 400 000 boe / jour. Parallèlement, la crise économique de 1997 en Indonésie a poussé les populations du delta à s'engager dans des développement locaux avec l'aquaculture et les cultures de crevettes. Ce développement, qui couvre maintenant l'essentiel de la surface du Delta entre en compétition avec les installations pétrolières et leur fonctionnement. Une étude d'impact a été réalisée pour mesurer les difficultés à coexister (activités de pêche versus activités de développement et de production) et définir quelles mesures prendre pour atténuer cette cohabitation, en d'autres termes comment concilier les activités industrielles avec celles des communautés locales.

Mots-clés: *production industrielle, activité communautaire, cohabitation, évaluation des impacts, mesures d'atténuation*

THE SEA EFFECTIVENESS CRITERIA AND PRINCIPLES IN ITALY

Gazzola, Paola
Department of Civic Design
University of Liverpool
74 Bedford Street South, Liverpool L69 7ZQ, UK
+44 0151 794 3453 Fax: +44 0151 794 3125;
gazzola@liv.ac.uk

Several sets of SEA effectiveness criteria and principles have been identified in order to support SEA practitioners worldwide and to further develop SEA in general. The international literature has also portrayed benefits of SEA that may result if they are effectively implemented. It may be hypothesised that the political benefits of SEA should automatically result if the criteria and principles for effectiveness are adapted. But is the capacity of SEA to result in its benefits directly related to those effectiveness criteria portrayed in literature? Furthermore, it is also assumed that elements and criteria might in effect not be fully applicable to all planning systems, but only to varying degrees and that system specific SEA elements must be identified in differing context to guarantee an effective outcome. Given the presence and degree of validity of the basic SEA elements, are the SEA benefits achievable in all planning contexts and to which degree? And are there any unexplored benefits? Using Italy as a case study, the applicability of SEA effectiveness criteria and principles will be tested.

Key words*: SEA effectiveness criteria, SEA benefits, Italy*

REVISIONING THE PLACE OF PUBLIC PARTICIPATION IN ENVIRONMENTAL ASSESSMENT LAW

Sinclair, A. John
Natural Resources Institute
University of Manitoba
Winnipeg, MB R3T 2N2 Canada
+1 204 474 8374 Fax: +1 204 261 0038

This paper offers an evaluation of the legal provisions for public involvement in Canadian EA law and suggests needed reform to ensure that participatory activities are meaningful. The literature on public involvement provides the evaluative criteria and document review, semi-structured interviews and key informant input provide insight into legal reform. Reform in the way of essential components covering issues such as access and purpose, notice, access to information and the provision of resources is considered. As well, reforms related to process activities are suggested that consider issues such as the timing of involvement, two-way exchange of information, power balance and decision accountability.

Key words: *public involvement, EA law*

EVALUATION DE L'IMPACT DES EAUX USÉES ET INDUSTRIELLES SUR LE COMPORTEMENT ÉCONOMIQUE ET SANITAIRE DE LA COMMUNAUTÉ DES MZAMZA. PROVINCE DE SETTAT. MAROC

Laamari, Abdelali
Institut National de la Recherche Agronomique (INRA)
Maroc
INRA, BP. 589. Settat 26000 Maroc
+212 23 72 93 00 Fax: +212 23 72 93 06

Au Maroc l'agriculture est l'activité économique numéro un et consomme presque 86% du volume d'eau utilisée au Maroc. Les autres secteurs comme l'industrie et les ménages consomment, respectivement 8 et 6%. Les superficies irriguées sont en augmentation. Ainsi, d'ici l'an 2025 les besoins en eau doivent augmenter de 38% pour satisfaire l'irrigation. Les apports des pluies sont en diminution et ne suffisent déjà plus pour les besoins des nappes souterraines qui ne se sont plus rechargées. Au contraire ces nappes souffrent d'une surexploitation provoquée par les pompages excessifs. L'utilisation non contrôlée des eaux usées en irrigation n'est pas exempte de risques sanitaires. En effet, la pollution permanente liée aux rejets liquides domestiques et industriels véhicule des éléments toxiques et des facteurs de maladies infectieuses dangereuses. Les métaux sont aussi à l'origine des contaminations des sols, des chaînes alimentaires, des eaux souterraines et des eaux de surface. Ainsi, la dégradation de la qualité des eaux a suscité des investissements publics énormes en matière de contrôle, d'assainissement et de pré-traitement surtout en milieu urbain. Le milieu rural n'a pas attiré l'attention comme il se doit, les problèmes liés à la qualité de l'eau et ses effets sur la santé y sont peu abordés. L'application de l'approche écosanté à travers un projet de collaboration entre l'INRA et le CRDI impliquant des médecins et des spécialistes de l'environnement, a permis de dégager l'importance de la prise en ligne de compte l'ensemble des composantes de l'écosystème dans l'analyse du comortement sanitaire et socio-économique des communautés rurales. Les membres de la communauté ont pu développer des mécanismes et un mode de vie assez particulier pour limiter les effets néfastes des eaux usées et même proposer de nouvelles alternatives

institutionnelles et économiques pour assurer le bien-être des membres de la communauté.

EVALUATION OF FORESTRY PROGRAMS AND POLICIES IN MEXICO: THE EXPERIENCE OF THE NATIONAL FOREST COMMISSION

Casas de la Peña, Luis Miguel; López, Verónica Eguiarte; Vergara Blanco, Javier
National Forest Commission
Periférico Poniente y Carretera a Nogales s/n
3er piso, San Juan de Ocotán
Zapopan, Jalisco, CP 45019 Mexico
+52 33 3777 7073 Fax: +52 33 3110 0820
lcasas@conafor.gob.mx
veguiarte@conafor.gob.mx
jvergara@conafor.gob.mx
www.conafor.gob.mx

The forested regions of Mexico, comprising approximately 55 million hectares, are home to 12 million people, living in poverty for the most part. Of the total forested area, 80% is under communal property, 15% under private ownership and only 5% belongs to the nation. In order to alleviate poverty, improve productivity and sustain the viability of forest ecosystems, the Federal Government has implemented several programs. However, impact assessment is performed only on infrastructure projects and not on agricultural or forest policies, as is the case in many other countries. Programs and policies designed to achieve forest sustainability, improving environmental conditions and livelihoods in forests are not subject to an ex ante impact assessment and are only reviewed after their implementation, with the limited data on impacts available after a few months. In Mexico, the National Forest Commission has commissioned three external evaluations of their forest programs, covering the period 1997 - 2002. These programs are dedicated to reforestation, commercial tree plantations, natural forest enhancement for productive uses, and support for native and communal forest management. These evaluations lack adequate tools for translating resources invested in terms of actual environmental, social, technological and economic impacts and suffer from limited and, oftentimes, distorted information from the beneficiaries and other stakeholders. So far, the results of the evaluations range from performance appraisals to opinion surveys, resulting in insufficient criteria to modify the country's long term strategic forest programs. A policy impact assessment mechanism and a reform of the evaluation approach are proposed to enhance the way subsidies and other forms of support are designed, monitored and evaluated. This should contribute to ensure that economic resources dispensed by the Federal and State governments are used in a rational, useful way to reduce deforestation and degradation of forest resources, while providing decent alternatives for forest dwellers.

Key words: *forest policy assessment, sustainable forest development, ex post evaluation*

COMPARING THE GERMAN, DANISH AND DUTCH INSTITUTIONAL STRUCTURES FOR INVESTMENT IN TRANSPORT INFRASTRUCTURE AND DEVISING THE IDEAL MODEL BY CONSULTING EXPERTS AND PRACTITIONERS

de Jong, Martin
Delft University of Technology
Faculty of TPM
Jaffalaan 5, 2628 BX Delft, The Netherlands

Geerlings, Harry
Erasmus Universiteit Rotterdam
Erasmus Centre for Sustainable Studies and Management
PO Box 1738, 3000 DR Rotterdam, The Netherlands

In this paper, a stylized composition is made of the institutional structures as they exist for decision-making on transport infrastructures as they exist in Germany, Denmark and Holland. They are compared on four relevant aspects: 1. Role of CBA in the process, 2. Role of EIA in the process, 3. Role of pressure groups in the process and 4. Role of various government tiers in the process. On all four characteristcs of the institutional structure, Germany, Denmark and The Netherlands have different scores.

Subsequently, results are given from a survey held among Dutch experts and practitioners on the issue whether they would like to see German and/or Danish elements introduced in their own system. They were also asked to express how they thought changes in the institutional structure would affect various aspect of the quality of decision-making and what their ideal institutional model looks like.

Key words: *institutional structure, investment in transport infrastucture, German, Danish and Dutch models, hybrid profiles, expert opinion, ideal model*

ESIA—MORE THAN A TICK IN THE BOX?

Witchalls, Ben
BP
Building C Chertsey Road
Sunbury on Thames, Middlesex TW16 7LN UK
+44 1932 739 409
witcb1@bp.com • www.bp.com

Finney, Robert
BP
+44 1932 763 742
finneyrw@bp.com

Integrated environmental and social assessment is increasingly becoming part of national regulatory approval processes, to estimate and manage the impacts of oilfield developments upon the natural and human environment. Even at pre-project stages, the Environmental and Social Impact Assessment (ESIA) can form part of the company decision-making process for country entry. The ESIA should not be

viewed however simply as a regulatory 'tick-in-the-box.' Effective integration of the ESIA findings, into the engineering design process can deliver benefits in impact mitigation and environmental management across all stages of the development. The international community is demanding increasingly rigorous environmental and social assessments of planned developments by international operators and reputation can be strongly influenced by the consistency and quality of the assessment process and the extent to which ESIA commitments are delivered. The OGP ESIA in Projects Taskforce has been formed to develop industry guidance, which will be applicable to development projects in any geographical area, thus facilitating the attainment of a consistently high standard by all operators, to align itself with international expectations. The aim is both to add technical value and to facilitate interactions with stakeholders and third parties. Given the diversity of project specifics, company internal processes, local environmental sensitivities etc., the approach must offer a high degree of flexibility in its application. 'Building-blocks' based on agreed 'good practice' to be assembled as appropriate, are viewed to offer greater potential than a more rigid process. In addition to direct application to oil and gas developments, extrapolation to downstream projects is possible. A workshop was held in November 2003 to share experie8nce through 'lessons-learned.' It provided a means of achieving consistency in delivery of high quality environmental and social impact management. More are planned.

Key words: *better value, consistency, alignment, OGP*

SCREENING FOR CORPORATE SOCIAL RESPONSIBILITY (CSR) ISSUES IN DUE DILIGENCE

Clarke-Whistler, Karen
Golder Associates Europe
78 Cannon Street, London, EC4N 6NQ
+44 (0)20 7618 6477 Fax: +44 (0)20 7618 8106
kwhistler@golder.com

Environmental due diligence assessments provide an indication of environmental liability and historical contamination 'within the fence line.' However they do not address ongoing operational issues, community relations, management quality, and broader reputational issues that may affect value. Recent studies have shown that these 'intangibles' may account for a high proportion of company value. Changes in corporate governance standards mean that disclosure of such information is frequently included in general disclosure clauses in sales/purchase agreements.

This paper describes an approach that extends due diligence to provide additional information on issues that may have a material impact on the current and future value of assets and ongoing operations, including:

- Environment, health and safety
- Social and ethical issues
- Corporate governance and business practice

The approach described has been used successfully to provide a broader view of current and potential future liabilities that may affect the value of commercial and industrial properties.

Key words: *corporate social responsibility, due diligence, environment, health and safety, social*

MINING DEVELOPMENT PROJECTS AND THE ENVIRONMENT THE AFRICAN EXPERIENCE

Shannon, Eugene H.
African Development Bank
Rue Heidi Nouira, 1002 Tunis Belvedere, Tunis, Tunisia
+216 71 10 3209 Fax: +216 71 832 208
e.Shannon@afdb.org

Industrial activities depend on natural resources; one of which happens to be the mining industry. This industry continues to play a major role in the economic sector of most developing countries, particularly, Africa. Today, other than the agricultural sector, large and small-scale mining still play a significant role in the overall socio-economic and physical infrastructure development of these countries.

The activities of National and Trans-national Corporations (TNCs) in the mining sector have made major impacts on the economies and employment generation of most African Countries, through technology transfer and mining ventures. However, environmental damages have thus far been generally overlooked. This need is receiving a tremendous amount of attention in light of attempts to include environmental considerations into every aspect of the socio-economic development plans and policies of African Developing countries.

In view of the fact that trans-national and national corporations will continue to play key roles in the development of mining vestures in developing countries, African countries are applying sufficient attention to the environmental aspects of mining activities undertaking by TNCs, by developing Environmental Policies and Guidelines and by conducting Environmental Impact Assessments (EIAs) studies prior to exploitation and development of these resources.

The African Development Bank as a development partner, finances mining projects in its Regional Member Countries (RMCs). Against this background, it has developed Mining and Industrial Policy Guidelines which are utilized when preparing and appraising projects.

Because project-specific environmental impact assessments are not adequate instruments for addressing impacts at the policy, plan and program (PPP) levels, and are unable to address cumulative impacts, the Bank has been committed to introducing Strategic Impact Assessment (SIA) Guidelines to be used as a systematic process in addressing the environmental consequences of proposed policy, program or plan initiative of multinational projects including mining, so as

to ensure that they are fully included and appropriately addressed at the earliest stage of decision-making on par with social and economic considerations.

Environmental and Social Assessment Procedures (ESAP) have also been developed by the Bank so as to reflect the more integrated environmental and social approach in addressing cross-cutting themes. The guiding principles of the ESAP is to ensure that the Bank's policy, program and plan have been designed to make them environmentally and socially sustainable, involving stakeholder participation and timely disclosure.

RECOMMENDATIONS FOR THE INTEGRATION OF STRATEGIC ENVIRONMENTAL ASSESSMENT IN THE PROCEDURE OF THE GERMAN FEDERAL TRANSPORT INFRASTRUCTURE PLAN

Wende, Wolfgang
Technical University Berlin
Dept. for Landscape Planning and Environmental Impact Assessment
Sekr. FR 2-6, Franklinstr. 28/29
10587 Berlin, Germany
+49 30 314 73284 Fax: +49 30 314 73284
wende@ile.tu-berlin.de

A research team, conducted by the Technical University Berlin, worked on solutions for the integration of Strategic Environmental Assessment (SEA) in the German transportation planning system. The objective was to elaborate technical and methodological opportunities for the implementation of the SEA Directive.

The present process of the Federal Transport Infrastructure Plan is a complex project assessment procedure to investigate the necessity and urgency of single infrastructure projects. For the implementation of a sustainable transport policy with an integrated SEA in the future, this approach should be modified. What is required is a more extensive, more conceptually oriented 'Federal Transportation Development Plan,' which does not only include single projects, but also presents basic alternatives.

The research team has created a draft of an overview for the integration of SEA in the elaboration procedure of the Federal Transport Infrastructure Plan. In addition, suggestions are made for the carrying out of consultation on a national level. In terms of content and technical tasks, the research project has developed methods for the analysis and assessment of the current status of the environment, of significant effects on the environment, and of alternatives dealt with in the context of annex I lit. b, c, d, e, f and h of the SEA Directive. How can this environmental information be investigated on a national and comprehensive stage? The IAIA conference presentation will illustrate solutions to this question with corresponding technical and methodological approaches.

THE SHIFTING PARADIGM OF IMPACT ASSESSMENT AND MITIGATION: THE EMERGENCE OF VOLUNTARY IA AND MITIGATION

Dauvergne, John
Environmental Affairs Branch
Industry Canada
235 Queen Street, Ottawa, ON K1A 0H5 Canada
+1 613 952 2269 Fax: +1 613 954 3419
dauvergne.john@ic.gc.ca

Much of impact assessment (IA) is project oriented and required by legislation. However, more and more of IA in Canada today is sector oriented and has companies making entirely voluntary commitments. This presentation provides a general overview of frameworks that mobilize industry into voluntarily mitigating adverse environmental effects and improving environmental performance. It looks at industry-led and Canadian government-led frameworks (Responsible Care, Towards Sustainable Mining, Agriculture Policy Framework, etc.). It pays particular attention to the drivers of industry's engagement, the difficulties of engaging small and medium-sized enterprises, the achievements of particular initiatives, and how some frameworks are evolving into regimes of self regulation and environmental stewardship. Its theme is: voluntary IA and mitigation has emerged to be of at least equal importance to legislatively-based IA. This "paradigm shift," which has been little noticed, has important public policy implications for other jurisdictions and countries.

AN ADAPTIVE IMPACT ASSESSMENT APPROACH: THE PEACE RIVER PROJECT

Nathwani, Meera
Shell Canada Ltd.
400, 4th Avenue S.W., Calgary, AB T2P 2H5 Canada
+1 403 691 3422 Fax: +1 403 691 4255
meera.nathwani@shell.ca

Creasey, Roger
Shell Canada Ltd
+1 403 691 4238 Fax: +1 403 691 2224
roger.creasey@shell.ca

Foster, Ken
AMEC Earth and Environmental
221, 18th Street S.E.
Calgary, AB T2E 6J5 Canada
+1 403 235 8128 Fax: +1 403 248 2188
ken.foster@amec.com

Shell Canada's Peace River Complex is a heavy oil production facility that has existed on the site for more than 30 years. As part of an initiative to maximize production, Shell sought regulatory approval for a production increase that included additional land disturbances. An EIA was required by regulatory agencies in support of the commercial application. Detailed baseline environmental programs provided information on the type and distribution of unique, uncommon or valued environmental components in the

project area. The distribution of these components was presented as constraints maps (using GIS software), which were provided to the engineering design team. Environmental components were prioritized in terms of sensitivity to disturbance and known ecological importance. The resulting project design met business objectives yet mainly avoided disruption to environmental components identified as important in the baseline studies, thus minimizing project impacts. Detailed descriptions of the remaining impacts of the project on these important environmental components became the focus of the impact assessment.

This integrated constraints mapping approach differs from the more routine impact assessment approach, within which a project design derived independently of the environmental programs is superimposed upon environmental baseline maps, and impacts are calculated with minimal or no consideration for movement or alteration of project components. This approach resulted in (1) a project design that presented the least risk and extent of significant environmental effects, and (2) an EIA in support of the project that focused on the most significant impacts resulting from development (the disturbance of important environmental components). Early integration of mitigative measures into project design, such as avoidance of important or sensitive environmental components to the extent possible, is a key principle in responsible ecosystem management and sustainable development.

Key words: *impact assessment, constraints mapping, ecosystem management, sustainable development*

TOWARDS AN ENVIRONMENTAL IMPACT ASSESSMENT FOR THE MACKENZIE GAS PROJECT: OPPORTUNITIES, CHALLENGES AND LESSONS LEARNED

Kennedy, Alan J.
Environment and Socio-Economic Assessment, Mackenzie Gas Project
Imperial Oil Resources
237 - Fourth Avenue SW, Calgary, AB T2P 3M9 Canada
+1 403 237 3485 Fax: +1 403 237 2102
alan.j.kennedy@esso.ca

Green, Jeffrey
Mackenzie Project Environmental Group
AXYS Environmental Consulting Ltd.
Suite 300, 805-8th Avenue SW
Calgary, AB T2P 1H7 Canada
+1 403 269 5150
jgreen@axys.net

Rozon, Gordon
Mackenzie Project Environmental Group
AMEC Earth and Environmental
221-18th Street SE, Calgary, AB T2E 6J5 Canada
+1 403 248 4331
g.rozon @amec.ca

The Mackenzie Gas Project (MGP) plans to develop the three largest discovered northern onshore natural gas fields in the Mackenzie River delta area of northern Canada and transport the gas by pipeline to southern markets. The project is composed of five separate components; three field developments including: Niglintgak, Taglu and Parsons Lake. A gathering pipeline system within the Mackenzie delta for gas and natural gas liquids, and a gas transmission pipeline system down the Mackenzie river valley from Inuvik in the Northwest Territories to northern Alberta. The gas and will then enter existing transmission pipelines in Alberta. The MGP is being developed by five organizations including Imperial Oil Resources Ventures Limited (Taglu), the Aboriginal Pipeline Group (transmission pipeline), ConocoPhillips and ExxonMobil (Parsons Lake) and Shell Canada Ltd. (Niglintgak). The project is to be constructed from 2006 to 2009 with start up in 2010.

The MGP is subject to a complex regulatory regime involving twelve separate regulatory agencies with jurisdictional authority and fourteen federal government departments with potential regulatory authority for EIA. A cooperation plan has been developed by the regulators in an effort to provide a framework for a coordinated EIA review process for the MGP. The Cooperation Plan provides for a two-year public review process for the MGP from 2004 to 2006.

An omnibus Environmental Impact Assessment (EIA) that will assess all the previously mentioned MGP components is currently being prepared by Imperial Oil on behalf of the proponents. The EIA is a substantial undertaking that involves two years of environmental baseline data collection and one year of time to prepare eight volumes of documentation. The EIA consultation team consists of a consortium of four environmental consulting firms with approximately 150 contributing professionals. The approach to the EIA is community focussed and includes the integration of current EIA methodology with the unique requirements of the Canadian north including the important social and economic impacts and the use of traditional knowledge in EIA.

The paper, as the tile suggests, will chronicle the development of the EIA for the MGP and will discuss the unique aspects and lessons learned from of this important environmental assessment.

Key words: M*ackenzie Gas Project, northern Canada, oil and gas development, social and economic impacts, traditional knowledge and EIA*

ENHANCED PUBLIC PARTICIPATION IN EIA PROCESS IN NEPAL

Uprety, Batu Krishna
Environmental Assessment Section
Environment Division
Ministry of Forests and Soil Conservation
Secretariat Complex, Kathmandu, Nepal
+977 1 4230862
upretybk@wlink.com.np

Nepal started conducting EIAs of major infrastructure projects such as road, hydroelectricity, and industries through policy formulation in early 1980s. In 1993, the Government endorsed the national EIA guideline and its use was ramified to prepare and approve EIA reports of the prescribed projects. Recognising the importance and benefits of EIA, the Environment Protection Act (1996) and Environment Protection Rules (1997) were enacted which include over 200 projects of different size requiring either IEE or EIA. The environmental law also includes details on approval process for IEE and/or EIA including Scoping Document and Terms of Reference.

Nepal underscores the importance people's participation, as a key element, in EIA system. The proponent is required to publish a 15-days public notice in the national newspaper before the submission of the Scoping Document for approval of each project requiring EIA study in order to ensure that concerns and issues of the stakeholders and affected people are adequately addressed by the EIA study. After the preparation of the draft EIA report, the proponent must conduct a public hearing at the project site. Furthermore, the competent authority - the Ministry of Population and Environment - must publish a 30-days public notice before the approval of EIA report of any sector to provide stakeholders additional opportunities for comments and suggestions on the final EIA report. As of December 2003, Nepal has approved about 24 EIA reports of various sectors.

This paper will examine people's participation, time taken, legal process, and inputs of the stakeholders during the preparation and approval of EIA reports of the hydropower projects, and industries developed by the private sector. It will also examine practices, problems faced, people's empowerment, challenges and opportunities in expanding public participation in impact assessment process in Nepal.

Key words: EIA, *public participation, hydropower, industry*

SPATIAL PLANNING GUIDANCE FOR ACHIEVING SUSTIANBLE URBAN DEVELOPMENT

Alshuwaikhat, Habib; Aina, Yusuf
King Fahd University of P & M
Department of City & Regional Planning
KFUPM Box 1632
Dhahran, Eastern Province 31261, Saudi Arabia
+966 3 860 2824 Fax: +966 3 860 4972
habibms@kfupm.edu.sa
faculty.kfupm.edu.sa

Sustainable planning guides are being developed to direct planning both at the local and regional levels towards sustainability. However, due to the multifaceted nature of spatial planning, different guides do focus on different aspects of planning and tend to overlook or put less emhasis on other aspects. The goal of achieving susutainability through spatial plannig requires that integrated sustianble guidance which will incoroporate all aspects should be developed. The paper discusses the current framework of sustainable spatial planning in Saudi Arabia. It highlights the need for better planning guidance and proposes general guidelines in view of current international practices. The guidelines are very perinent at this time as many municipal master plans are being reviewed for many cities in the Kingdom of Saudi Arabia.

Key words: *sustainable development, spatial planning, strategic planning, Saudi Arabia*

INTEGRATED IMPACT MONITORING FOR INDUSTRIAL AREA: KERTEH MALAYSIA

Hambali, Nuraini
PETRONAS Research & Scientific Services Sdn. Bhd
Lot 3288&3289 Off Jalan Air Itam
Bangi Instituional Area, Kajang, Selangor 43000 Malaysia
+603 89283174 Fax: +603 89283185
nurain@petronas.com.my

As part of the Environmental Impact Assessment approval conditions, all petrochemical plants including in Kertih Industrial Area are required to conduct environmental impact monitoring that comprises air quality, noise, soil and inland waters. Each plant monitors the impact from its plant operation without considering a combine effect from neighbouring plants. PETRONAS Research & Scientific Services Sdn. Bhd (PRSS) proposed to Department of Environment (DOE) to initiate an integrated monitoring programme to enable the overall impacts from all the plants in the industrial area be monitored and controlled in a most effective manner. The success of the proposed integrated monitoring programme is dependent on cooperation and dedication of plant owners and Department of Environment. The advantages of the integrated programme are: accumulative impacts from all the plants operation to environment can be modelled and analyzed to assess the state of the environmental conditions of the area and providea a basis for a later action programme; all data and information obtained can be shared by all the plants and Department of Environment (DOE) and relevant authorities for decision making in future Kerteh land use and planning; and related issues and concerns can be discussed and solved between the plants and DOE; and it promotes local environmental management alliance. The programme has a comprehensive scope of works. A baseline study for the area covers air quality, noise, soil, groundwater and surface waters performed. A database on existing environmental quality, site characteristics, pollution pathways, environmental hazards and risk to health and geographical information system for the area were established for designing a most effective programme. The program has been implemented for two years and proven effective minimizing impacts to environment and cost saving.

Key words: *accumulated impact, integrated monitoring, cost effective*

CASE STUDY: ENVIRONMENTAL MONITORING USING REMOTE OPTICAL SENSING [OP-FTIR] TECHNOLOGY AT AN INDUSTRIAL WASTEWATER TREATMENT PLANT

Hall, Freddie
US Air Force
7701 Arnold Street, Suite 205
Tinker AFB, OK 73145-9100 USA
+1 405 734 3114 Fax: +1 405 734 5148
freddie.hall@tinker.af.mil

During production and maintenance operations at Tinker Air Force Base in Oklahoma City, Oklahoma, industrial wastewater streams are generated which contain organic and heavy metal compounds. These waste streams result from chemical depainting operations, chemical cleaning processes, and electroplating operations. Processes discharging wastewater are treated at the on-site industrial wastewater treatment facility [IWTF]. Regulatory reporting mandates require identifying volatile organic compound emission sources, estimating emissions from the IWTF, quantifying ambient air concentrations surrounding the facility via air dispersion modeling, and evaluating computer-generated numerical concentration estimates with respect to discontinuous field data and an open-path optical remote monitoring system. The objective of this paper is to compare three strategies for meeting air quality management requirements: (1) use of a coupled model [air emission model and air dispersion model]; (2) use of air quality monitoring data collected via discontinuous air sampling and analysis [i.e., periodic canister monitoring]; and (3) use of air quality data generated by open-path optical remote monitoring using Fourier Transform InfraRed Spectroscopy [OP-FTIR]. Validation of the predictive accuracy of the three strategies will be made based on (a) comparisons and statistical testing of receptor location predictions with air quality data from periodic canister monitoring, (b) comparisons and statistical testing of predictions along the open path optical remote monitoring boundary line with measured concentrations based on OP-FTIR; and (c) comparisons and statistical testing of pertinent field canister monitoring data with open-path monitoring results.

Key words: *industrial wastewater treatment, OP-FTIR, open-path*

HEALTH RISK ASSESSMENT AT AN INDUSTRIAL WASTEWATER TREATMENT PLANT

Hall, Freddie
US Air Force
7701 Arnold Street, Suite 205
Tinker AFB, OK 73145-9100 USA
+1 405 734 3114 Fax: +1 405 734 5148
freddie.hall@tinker.af.mil

During production and maintenance operations at the Oklahoma City Air Logistics Center [OC-ALC], industrial wastewater streams are generated which contain organic compounds [primarily phenol and methylene chloride]. These streams result from both direct and indirect contact with organic compounds via chemical depainting operations, chemical cleaning processes, and electroplating operations. Organic materials in the combined wastewater are treated at the on-site industrial wastewater treatment facility [IWTF] with unit processes including open surface basins. Some of these treatment processes result in the release of semi-volatile and volatile organic compounds [VOCs] from the wastewater to the ambient air. Because emitted VOCs can create potential health risks for treatment facility workers and the general public in the immediate surrounding areas, Tinker AFB is required to quantify [and report] VOCs released into the atmosphere. Such regulatory reporting can encompass identifying VOC emission sources, estimating emissions from the IWTF, quantifying ambient air concentrations surrounding the facility via dispersion modeling, and evaluating computer-generated numerical concentration estimates with respect to discontinuous field data and an open-path optical remote monitoring system. The focus of this paper is to identify and quantify health risks associated with phenol and methylene chloride releases surrounding the IWTF. The risk assessment will include calculation of an equivalent human dose [based on animal mortality studies], the maximum risk for individuals in the general population, excess number of cases of cancer, the average excess number of cases of cancer generated per year, and loss of life expectancy for the general population.

Key words: *industrial wastewater treatment, health risk assessment*

COMPUTER MODELING OF AIR QUALITY IMPACTS RELEASED FROM AN INDUSTRIAL WASTEWATER TREATMENT PLANT

Hall, Freddie
US Air Force
7701 Arnold Street, Suite 205
Tinker AFB, OK 73145-9100 USA
+1 405 734 3114 Fax: +1 405 734 5148
freddie.hall@tinker.af.mil

Coupling of an appropriate source emissions model and an atmospheric dispersion model represents a cost-effective and environmentally-responsible approach for meeting impact prediction and regulatory reporting requirements, as well as problem analysis and pollution prevention needs, associated with emissions of two chemical depainting agents [phenol and methylene chloride] from a liquid industrial wastewater treatment facility [IWTF]. This coupling study was conducted for the IWTF at Tinker Air Force Base [AFB] in Oklahoma City, Oklahoma. Phenol and methylene chloride are used as chemical depainting agents at the AFB, with the liquid effluent from such uses ultimately subjected to an on-base IWTF. Atmospheric emissions of the depainting agents occur from various unit processes in the IWTF. Use of the coupled model in the predictive mode is illustrated via the development of geographically-based profiles of the ground-level concentrations of phenol and methylene chloride in the surrounding environment of the IWTF. Model validation is

demonstrated via comparisons and statistical testing of receptor location predictions with actual air quality data developed from discontinuous air sampling and analysis. Finally, it will be emphasized that the coupled model can be used for: the conduction of site specific health risk assessments; emissions reporting regulatory compliance determinations; and evaluation of the air quality impacts of on-base process change scenarios, pollution prevention activities, and changes in the design or operation of the IWTF.

Key words: *industrial wastewater treatment, computer modeling*

POLLUTION PREVENTION SUCCESS STORIES AT TINKER AIR FORCE BASE, OKLAHOMA

Hall, Freddie
US Air Force
7701 Arnold Street, Suite 205
Tinker AFB, OK 73145-9100 USA
+1 405 734 3114 Fax: +1 405 734 5148
freddie.hall@tinker.af.mil

The Oklahoma City Air Logistics Center's [OC-ALC] Pollution Prevention Program is simple, direct, and fundamental: reduce the purchase and use of targeted toxic chemicals. OC-ALC has become the Air Force leader in introducing new prototype technologies into all maintenance processes and quantifying their environmental benefits. The innovative technologies are reducing the handling of hazardous materials and eliminating hazardous waste. The OC-ALC pollution prevention program involves efforts to reduce the use of wastes through a hierarchy of actions. The actions are as follows: source reduction, chemical substitution, recycle and reuse, treatment, and disposal. At the root of the program is a compliance site assessment that identified four major processes in aircraft depot maintenance activities [painting, depainting, cleaning, and electroplating] that generates the majority of the center's hazardous waste streams. Purchase and use of hazardous chemicals are tracked to verify the validity of implemented technologies and monitor trends. The objective of this paper is to highlight technologies that have reduced targeted hazardous chemical purchases by 1,500,000 pounds, reduced the generation of hazardous industrial waste by 8,000,000 pounds, and reduced the use of ozone depleting substances [ODSs] by 330,000 pounds, annually. This paper will discuss the following technologies: abrasive carbon dioxide blasting, environmentally-acceptable chemical depainting agents, radome chemical depainting, medium pressure water jet knife, high pressure aircraft component subsystem, advanced vapor degreaser, NESHAP-compliant wipe solvents, powder coatings, and alternative electroplating technologies [i.e., ion vapor deposition, high velocity oxygen fuel, electromagnetic particle deposition, etc].

Key words: *pollution prevention*

COMMUNITY-BASED IMPACT ASSESSMENT NETWORK FOR EASTERN AFRICA: TRAINING OF TRAINERS GUIDE ON COMMUNITY BASED ENVIRONMENTAL ASSESSMENT AND SOUND DESIGN FOR SMALL SCALE ACTIVITIES

Kodiaga, Tito
Pact Kenya
Box 690 Sarit Centre
+1 254 2-578271/3/4 Fax: +254 2 570775
tjoel@pactke.org

Small-scale activities are currently the focus of many development and donor agencies projects in poverty alleviation and sustainable development in developing countries. Despite this shift, unlike large scale projects with the greatest threat to the environment hence wide availability of materials detailing methodologies, framework, principles and techniques, small scale activities have inadequate resource materials and framework for assessment hence limitation in the application of lower level environmental and social safeguards processes.

A consortium of organizations in East Africa interested in CB impact assessment known as the Community Based Impact Assessment Network for Eastern Africa (CIANEA) has with support of ENCAP/REDSO program and SEI-B/Tellus Institute just concluded the development of training of trainers materials for application in small scale activities and in effect conducted the first regional training of trainers course on environmental assessment and sound design for small scale activities in East Africa in Nairobi, Kenya.

This presentation discusses the content of the three separate but complimenting training materials (ToT guide, Best Practice and Source Book) as well as their potential role and application in CDD and lower level environmental and social safeguards projects implemented by institutions like World Bank, European Union, Governments and USAID among others. The relationship of the developed materials to SAIEA's current program on EA and public participation for the SADC countries will also be discussed as well as its overall contribution to the CLEIAA EA and M capacity building strategy.

Key words: *Community Based Impact Assessment Network for Eastern Africa, community based impact assessment, CDD, social funds, training of trainers, CIANEA guide, best practice, sourcebook, Southern African Institute for Environmental Assessment (SAIEA) World Bank, Capacity Development and Linkages in EIA in Africa (cleiaa)*

HIGHWAYS AGENCY ENVIRONMENTAL PERFORMANCE: ABOVE THE WATERLINE

Kerwick-Chrisp, Dean
Highways Agency
Heron House 49-53 Goldington Road
Bedford, Bedfordshire MK40 3LL UK
+44 (0)1234 796080 Fax: +44 (0)1234 796155
kerwiad@highways.gsi.gov.uk

The Highways Agency (HA), an Executive Agency of the UK's Department for Transport, is responsible for operating, maintaining and improving the strategic road network in England. Performance indicators have been developed that measure the HA's delivery of the UK Government's objectives for transport. The HA has advice and procedures for environmental survey, assessment and reporting informing and influencing road scheme design through the entire project planning process from conception to implementation. Regulators, interested parties and society have the opportunity to contribute to impact assessment and influence the project appraisal findings. To date, beyond informing design and investment decisions on individual projects, little use has been made of the growing database of project appraisal information. Furthermore, despite environmental indicators having a strong correlation with the delivery of desirable outcomes, the business has focussed on output measures delivering targeted positive interventions. This paper outlines a proposal for better data analysis and the development of outcome environmental performance measurement within the HA illustrating the extent to which appraised proposals coming forward are addressing the delivery of environmental sub-criteria. When viewed over a number of years, this will illustrate the business' environmental performance trend. The primary objectives of the proposals are to derive an approach embracing the whole canvas of the HA's works on the network: environmentally targeted investments; overall performance of road improvements; and, long-term prudent custody of the highway. To report predicted environmental impacts of all improvement schemes, there are inordinate ways in which appraisal data could be analysed and viewed. Careful selection of graphics can be used to convey quite complex messages interested stakeholders. This paper, by drawing on the appraisal of HA's major improvement programme and local network schemes, illustrates the concept of performance against a "waterline" and explores future business monitoring applications.

Key words: *performance indicator, appraisal, environmental impact assessment*

BETTER STAKEHOLDER INVOLVEMENT THROUGH MULTI-ATTRIBUTE DECISION ANALYSIS

Thrift, Andrew
UBC Mining Engineering Sustainability Working Group
1896 Stainsbury Ave
Vancouver, BC V5N 2M5 Canada
+1 604 874 0149 Fax: +1 604 822 5599
thrift1998@hotmail.com

Corporations today are faced with increasing demands by government and civil society for more public involvement in corporate decisions, particularly during the impact assessment process on new projects. Stakeholder consultation and participation, in addition to fulfilling regulatory requirements, can be valuable for building constructive relationships with communities of interest and thereby reducing social risk for projects. Public participation in decisions that affect them is an integral part of progressing towards sustainable development. However, experience has shown that involving stakeholders in decisions at the project assessment stage often requires them to have a high level of technical knowledge. Also, the process, although well intentioned, is frequently complicated by hidden agendas and past conflicts. My presentation will discuss how the field of decision analysis, and in particular multi-attribute approaches such as multiple accounts analysis (MAA) and multi-attribute tradeoff analysis (MATA) can provide a constructive, technically-sound means of involving stakeholders in decision making. These methodologies emphasize explicit characterization of values and objectives and can provide a framework for capacity-building and interest-based rather than positional dialogue, as well as an efficient means of allocating impact assessment resources. My focus will be on application of these approaches in the mining industry although I will also draw on experience of other natural resource industries. Case studies of successful application of these approaches will be presented. I will also suggest how these innovative methods could be further employed, as well as their strengths and drawbacks, based on preliminary results from my thesis research at a northern Canadian mine.

Key words: *decision analysis, stakeholder consultation, mining, public participation*

INTEGRATED APPROACHES TO SUSTAINABILITY ASSESSMENT

Varey, William J.
Forsyth Consulting Group Pty Ltd
+61 8 9383 3451 Fax: +61 8 9383 3401
william@fcg.com.au
www.fcg.com.au • www.emgrnc.com.au

This paper outlines research on a model for Integrated Sustainability Assessment (ISA). The model combines 20 key elements of sustainability assessment into a workable sustainability framework.

The model was applied in the assessment, generation and modification of 12 sustainability projects. The projects involved the sustainability assessment of proposals by managers acting on behalf of a local government authority. The managers were provided with training in an integrated thinking methodology for sustainability assessment and given the necessary tools for that assessment. In assessing the projects, they were asked to consider all 20 elements in the integrated model.

The findings were that when confronted with the choice between changing their existing thinking or changing the integrated model, some of the participants undertaking the assessments consciously or unconsciously altered the assessment tool, and therefore altered the outcome of the assessment processes. Omission of one or more elements from the integrated model created distinctly different outcomes in the assessment process.

From the project proposals assessed, 20 distinctly different forms of sustainability assessment were identified as being theoretically possible, one resulting from the omission of each single component of the integrated model.

The paper describes the 20 components used in the ISA process, provides a definition of each component, explains the reason for the necessary inclusion of each, the effect if omitted from an ISA process, and the descriptive labels for the 20 conceptual types of sustainability assessment identified.

The aim of this research is to make conscious the unconscious decisions made in structuring sustainability assessment processes to include or exclude different elements, thereby making transparent the different ways of approaching sustainability assessment. The model presented, in describing an ISA framework, provides a new categorisation as a way of assessing the appropriateness of different forms of sustainability assessments from an integrated perspective.

Key words: *sustainability, integrated sustainability assessment, ISA, local government, assessment framework, governance, TBL, government assessment , private sector proposals*

FROM MINIMAL DAMAGE TO NET CONTRIBUTION: MINING'S SEVEN QUESTIONS TO SUSTAINABILITY

Hodge, R. Anthony
Anthony Hodge Consultants Inc.
231, Terrasse Barret
L'Assomption, QC J5W 1M4 Canada
+1 450 589 6944 Fax: +1 450 589 6975
thodge@anthonyhodge.ca

Thomson, Ian
On COMMON GROUND Inc.
906-1112 West Pender Street
Vancouver, BC V6E 2S1 Canada
Vancouver Office: +1 604 681 8600
Hornby Island Office: +1 250 335 1060
rockdoc@direct.ca

Mining/Minerals Team, International Institute for Sustainable Development, Winnipeg Canada

Over the past decade, much effort has been applied to linking sustainability concepts with impact assessment techniques. The result is a shift from an emphasis on "mitigation of significant adverse environmental effects" to demonstrating a "positive contribution to sustainability." This paper examines the nature and implications of this change.

Interestingly, events in the mining industry have played a leading role in developing and testing these ideas. In 2001-2, a multi-interest working group was brought together under the aegis of the Mining Minerals and Sustainable Development project and asked to develop a set of practical principles, criteria and indicators that can be used to assess the performance of individual, existing or proposed operations in terms of their compatibility with the concepts of sustainability. The starting point for this effort was 10 pieces of relevant work, including two landmark environmental impact assessments - the Voisey's Bay and Tulsequah Chief mining projects.

The result of this effort is the Seven Questions to Sustainability (7QSD), a robust, dynamic framework for assessment in which questions are asked and the responses obtained compared to ideal or desired answers. At the base of this approach is the question "Is the net, long term contribution of a project/operation to people and ecosystems, positive or negative?" From this opening a plethora of further questions cascade down in seven broad areas that address relationships (a process of engagement), the ultimate ends (people and the environment) and the means to achieve these ends (economy, non-market activities, institutional arrangements and governance) and, finally, overall integration and continuous learning.

Although the source of this work is the mining industry, applications described in this paper also include forestry, aquaculture, fisheries, community development, aid and relief programs, and the management of protected areas. Together, these cases demonstrate the power and generic nature of this framework.

Key words: *impact assessment, contribution analysis, mining, sustainability*

WHOSE WASTE IS IT ANYWAY?

Bland, Ric
Golder Associates Pty Ltd
Level 3, 50 Burwood Road
PO Box 6079, Hawthorn West, Victoria 3122 Australia
+61 3 8862 3500 Fax: +61 3 8862 3501
rbland@golder.com.au • www.golder.com

Boase, Allan
Golder Associates Pty Ltd
611 Coronation Drive, PO Box 1734
Milton BC, Queensland 4064 Australia
+61 7 3721 5400 Fax: +61 7 4052 1546
aboase@golder.com.au • www.golder.com

The importance of the Lord Howe Island Group was recognised with its inscription on the World Heritage List in 1982 for its outstanding natural values. With 105 endemic

plants, the islands support extensive colonies of nesting seabirds and at least 168 bird species have been recorded either living at, or visiting, the islands. A number of these are rare or endangered. The waters surrounding Lord Howe provide an unusual mixture of temperate and tropical organisms. The coral reef is the southernmost in the world and provides an example of the transition between coral and algal reefs. Historically, settlers made a living by hunting, fishing and growing vegetables, fruit and meat for trade with passing ships. Today tourism dominates the local economy. The existing landfill covers approximately 2 ha immediately behind Lagoon Beach, west of the airport and south of the settlement. Historically waste was tipped and burnt in-situ. More recently combustibles were incinerated daily in a cage, with solid waste stockpiled separately and periodically burnt. The resulting ash (and metals) was buried in a nearby swale, with putrescibles buried adjacent and septic sludge in soakage pits along the dunes. The Lord Howe Island Board cares, controls and manages much of the islands. The Board, together with the local Clean Up Australia Committee, proposed to develop a Waste Treatment & Recycling Facility. It was proposed to develop the facility at the existing landfill site, in the southern part of the settlement, near the lagoon. The Board and committee were concerned with the limited remaining area at the landfill, public health issues associated with landfilling, undesirable emissions and fire risk associated with daily incineration and potential impacts of leaching on the nearby lagoon. Commonwealth & state Approvals required an Environmental Impact Report, the preparation of which was begun in 1999.

Key words: *tourism, impact assessment, Lord Howe Island*

STATUS OF STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) PRACTICE IN SOUTH AFRICA

Retief, Francois
School of Planning and Landscape
University of Manchester
Oxford Road, Manchester, M13 9PL UK
+44 (0)161 275 6887 Fax: +44 (0)161 275 6893
francois.p.retief@stud.man.ac.uk

Rossouw, Nigel
Council for Scientific and Industrial Research (CSIR)
P O Box 320, Stellenbosch, 7599 South Africa
+27 (0)21 888 2400 Fax: +27 (0)21 888 2693
nigel.rossouw@csir.co.za

Jones, Carys; Jay, Stephen
EIA Centre, School of Planning and Landscape
University of Manchester
Oxford Road, Manchester, M13 9PL, UK
+44 (0)161 275 6873 Fax: +44 (0)161 275 6893
carys.jones@man.ac.uk
stephen.a.jay@man.ac.uk

South Africa is regarded as one of the leading developing countries in terms of contributing to SEA practice. However, no empirical research has been conducted to analyse and highlight experience. This paper provides an overview of the status and characteristics of SEA practice in South Africa in terms of tiers, types and geographic scales. The findings are based on the first extensive SEA survey for the country conducted during 2003. It confirmed that SEA practice is well established and increasing. Moreover the extent of practice compares well with, and the variety in terms of tiers types and scales even exceed that of, most international SEA systems. The research showed that apart from the traditional application of SEA at different tiers of decision making, it was also uniquely implemented as a substitute where strategic level decision making processes were weak or absent. The case studies reflected 'comprehensive' and a variety of 'sectoral' SEA types implemented at national, provincial, sub-regional and local geographic scales. The paper shows that South African SEA practice is vibrant and at the cutting edge of international SEA thinking and could provide solutions to the challenges of tailoring SEA for developing country contexts.

Key words: *strategic environmental assessment (SEA) practice in South Africa, SEA in developing country contexts, tiering, SEA types, geographic scales of SEA*

MITIGATION: PAPER PROMISES OR ACTUAL PRACTICE?

Tinker, Lauren
45 Howey Lane, Buntingford, Hertfordshire SG9 9BQ UK
+44 1763 271062
Lauren@atinker.waitrose.com

Cobb, Dick; Gurr, Jon
InteREAM
School of Environmental Sciences University of East Anglia, Norwich, Norfolk NR4 7TJ UK
+44 1603 592556 Fax: +44 1603 591327
d.cobb@uea.ac.uk
jon.gurr@uea.ac.uk

Bond, Alan
InteREAM
+44 1603 593402 Fax: +44 1603 591327
alan.bond@uea.ac.uk

Whilst mitigation of negative impacts is accepted as being one of the main aims of the environmental impact assessment process, ameliorating measures must be implemented if environmental impacts are to be effectively addressed. The English planning system can facilitate the implementation of mitigation measures identified in an Environmental Impact Statement (EIS) through planning conditions and obligations. This study analyses details of 40 planning applications in the East of England to investigate the practice of translating paper recommendations in the EIS into legal conditions and obligations. A high proportion of mitigation measures suggested in EISs were not translated into planning conditions or obligations. On the other hand, a significant number of conditions or obligations were imposed on developers which had no basis in the EIS. Guidance on

mitigation and planning had not significantly affected the process. The proportion of mitigation measures translated into conditions or obligations varied between development types, and was also affected by the environmental aspect studied. Several recommendations are made to improve the coverage of mitigation measures, including the use of environmental management plans.

Key words: *mitigation, conditions, planning obligations, effectiveness of mitigation, EIA*

ON THE SUCCESSFUL IMPLEMENTATION OF MITIGATION MEASURES: LESSONS FROM A CASE STUDY

Sánchez, Luis Enrique
Escola Politécnica, University of São Paulo
Av. Prof. Mello Moraes, 2373
05508-900 São Paulo Brazil
+55 11 3091 5186 Fax + 55 11 3091 5721
lsanchez@usp.br

Casteli Figueiredo Gallardo, Amarilis Lúcia
Institute of Technological Research, São Paulo
Av. Prof. Almeida Prado, 532
05508-901 São Paulo Brazil
amacafi@ipt.br

The discussion about the effectiveness of environmental impact assessment has shifted from the accuracy of impact prediction to our ability to effectively prevent significant environmental degradation and to fully implement cost-effective mitigation and other management measures. The actual impacts of the construction phase of a highway project in São Paulo State, Brazil, are reviewed by analyzing monitoring data. A detailed follow-up scheme and a tight internal control are the main reasons for the successful implementation of mitigation and other management measures required by the terms and conditions imposed on the project. A number of lessons learned may evolve into recommendations for similar projects: (i) a management system is a powerful tool to successfully carry on the implementation of mitigation and other management measures; (ii) checklists and audit protocols can be a practical solution to "translate" the terms and conditions of the environmental license, often stated in vague and inaccurate language, into enforceable, manageable and verifiable rules; (iii) external control is essential to guarantee the successful implementation of mitigation measures.

Key words: *effectiveness, environmental impact assessment, follow-up, highways, impact audit*

DEMONSTRATING THE ADDED VALUE OF A STRATEGIC APPROACH TO ENVIRONMENTAL AND SUSTAINABILITY ASSESSMENT

Curran, Johanna
WSP Environmental
3 The Courtyard, 48 New North Road
Exeter, Devon, EX4 4EP England UK
+ 44 (0) 1392 456367 Fax:+ 44 (0) 1392 412846
Johanna.curran@WSPGroup.com • www.wspgroup.com

This paper discusses the practical application of SEA and SA approaches to a range of planning situations and aims to demonstrate where taking a strategic approach will bring added value to the planning and development process.

An array of strategic planning documents are produced at different levels of planning and decision-making and at present, there tends to be a lack of application of environmental assessment until the point at which it becomes a requirement in the planning system. This results in situations where decisions on location, design, technologies and scale have already been made, opportunities for enhancement or innovative planning and design have been missed, delays in the detailed design occur as environmental or socio-economic constraints have not been identified during the early stages of the development planning, and any mitigation measures proposed tend to focus on reduction rather than avoidance of the impact.

This paper is written from the viewpoint of a consultant practitioner. It attempts to address some of the challenges in ensuring the delivery of what the planner or policy maker needs, whilst complying with legislation and conforming with best practice. It discusses how the application of an appropriate level of assessment, at the right stage in the planning process can bring real added value, bringing efficiency savings through streamlining the planning process and helping to deliver a more sustainable plan or programme.

The discussion is supported by specific case examples with particular reference being made to the development of a flexible, comprehensive and rigorous decision support tool, which has been designed to address specific aspects of the SEA process and to overcome some of the challenges associated with the practical application of SEA.

Key words: *SEA, SA, case examples*

TOWARDS INCREASING THE UTILITY OF FOLLOW-UP IN CANADIAN EIA

Storey, Keith
Department of Geography
Memorial University of Newfoundland
St. John's, NL A1B 3X9 Canada
+1 +709 737 8987 Fax: +1 709 737 3119
kstorey@mun.ca • www.mun.ca/geog/

Noble, Bram F.
Department of Geography
University of Saskatchewan
Saskatoon, SK S7N 5A5 Canada
+1 306 966 1899 Fax: +1 306 966 5686
bnoble@usask.ca • www.usask.ca/geography/

The importance of follow-up in the EIA process is clearly recognized in the Canadian Environmental Assessment Act (CEAA) in which, where it is considered appropriate, the responsible authority for a project will design a follow-up program and ensure its implementation. The Act is also explicit in recommending that the results of follow-up programs be used to improve the quality of environmental assessments. The purpose of this paper is to examine whether the specific requirements for follow-up under CEAA in fact provide the best opportunity for such quality improvements.

The definition of follow-up under CEAA requires the verification of the accuracy of the environmental assessment and determination of the effectiveness of measures taken to mitigate the adverse environmental effects of a project. We argue that the Act generally, and the requirements for follow-up specifically, adopts a negative perspective towards project effects by focusing on the mitigation of adverse effects, and also discourages the follow-up of important social or economic effects which are independent of project-related changes to the bio-physical environment. Secondly, we argue that verification of accuracy places an unwarranted emphasis on 'what was expected' rather than on 'what was wanted' in terms of environmental outcomes. Using examples from Canadian experience, we illustrate the limitations of the current approach to follow-up and suggest that greater utility would be achieved by focusing on whether the environmental objectives of the project in question have been achieved.

Key words: *follow-up, Canada*

WILDLIFE ROADKILL IN MAJOR HIGHWAYS IN KOREA

Lee, Sang-Don
Ewha Womans University
SeoDaeMun-Ku DaeHyun-Dong 11-1
Seoul 120-750 Korea
+82 2 3277 3545 +82 2 3277 3545
lsd@ewha.ac.kr
www.ewha.ac.kr/~lsd

Cho, Hee-Sun
Ewha Womans University
SeoDaeMun-Ku DaeHyun-Dong 11-1
Seoul 120-750 Korea
+82 2 3277 3774 Fax: +82 2 3277 3545
suniyang@hanmail.net

Yeom, Byung-Woo
Korea Institute of Geological and Mineral Resources
Yoosung-Ku Jan-Dong
Daejon 305-343 Korea
+82 042 868 3375
ybw@kigam.re.kr

Construction of a highway influences the fragmentation and deterioration of wildlife habitat. It is inevitable to observe the death of animals that are killed by vehicles. Nonetheless, the cause and status of animal roadkill have not been studied, and this study is the first attempt to analyze the roadkill on a major highway in Korea. We collected 860 individual dead animals in Joongang Highway during 1996-2003. Among them, the Korean hare (*Lepus sinensis*) had the highest figure, with 165 individuals (19.2%) found. Also found was the Korean racoon dog (*Nyctereutes procyonoides*) with 146 (17.0%), the Korean squirrel (*Sciurus vulgaris*) with 56 (6.5%), and the Korean roe deer (*Capreolus capreolus*) with 26 (3.0%). Domestic animals totaled 232 individuals (27.0%); the domestic dog (*Canis familiairis*) was 25 and the domestic cat (*Catus felis*) was 207. We also categorized the habitat on each side of the road as mountain-mountain, mountain-plain, mountain-river, plain-plain, plain-river, and river-river. The mountain-plain habitat had the highest number of dead animals, with 296 (38.9%) individuals, followed by mountain-mountain with 263 (34.6%). This indicates that wild animals associated with the mountain habitat were most influenced by the construction of roads. This study implied that we should mitigate the roadkill by designing artificial constructions such as eco-bridges, fences along the sideway, boxes under the highway, underdrain structures, etc. The monitoring and cause of habitat fragmentation with GIS approach should be followed to reduce the roadkill.

Key words: *wildlife, roadkill, highways, Korean racoon dog, Korea*

CRITERIA FOR EVALUATING THE QUALITY OF HEALTH IMPACT ASSESSMENTS

Parry, Jayne
University of Birmingham
Edgbaston, Birmingham
West Midlands B15 2TT England, UK
+44 (0) 121 414 3191 Fax: +44 (0) 121 414 7878
J.M.Parry.1@bham.ac.uk
www.publichealth.bham.ac.

Kemm, John
University of Birmingham, UK

Devlin, John
Department of Health, Ireland

Douglas, Margaret
Lothian Health Board, Scotland, UK

Fehr, Rainer
Bielefeld University, Germany

Letho, Juhani
Tampere University, Finland

Lock, Karen
London School of Hygiene and Tropical Medicine
England

McCarthy, Mark
University College, London, England
Marshall, Paul
Department of Health, England

Mathers, Jonathan
University of Birmingham, England

Nilunger, Louise
WHO ECHP, Brussels, Belgium

Nutley, Sandra
St Andrews University, Scotland

Putters, Kim
Tilburg University, The Netherlands

Scott-Samuel, Alex
University of Liverpool, England

Wismar, Mathias
WHO ECHP, Brussels, Belgium

Health impact assessment (HIA) has been enthusiastically promoted as an aid to better policy making , but others have questioned its usefulness. Good evaluations of HIA are required to resolve this question but to-date, there have been few, if any, evaluations of HIAs. In July 2003, fifteen participants, representing academics, policy-makers and HIA practitioners, drawn from the UK and Europe, met for three days in Birmingham (UK) to discuss how HIAs might be evaluated. The group concluded that the claims of HIA, as made for example in the Gothenberg Consensus Paper and other guidance, suggest four sets of criteria against which an HIA could be evaluated (1) Information - the extent to which the HIA informed the decision-making. (2) Prediction - the extent to which the predictions of the HIA prove to be correct (3) Participation - the extent to which the HIA made those affected by the decision feel more included. (4) Value-for-money - the extent to which the resources expended reflected the 'value added' of the HIA to the decision-making process. Having estabiuished this framework, the group identified a series of process and outcome indicators for the five stages of HIA: screening, scoping, impact appraisal, dissemination of findings, monitoring and follow-up. This paper will present and reflect upon the discussions held at the Birmingham meeting and the conclusions drawn by participants. The paper will outline the evaluation framework and the suggested indicators, and go on to discuss the next stages of work required to valid this tool. The meeting was sponsored by the U.K. Department of Health.

Key words: *health impact assessment, evaluation, quality assurance indicators*

ENVIRONMENTAL MANAGEMENT AND SKI AREA DESIGN AT SUNSHINE VILLAGE SKI AREA, BANFF, ALBERTA

Kerr, Dave
Golder Associates
1000, 940 - 6th Ave SW, Calgary, AB T2P 3T1 Canada
+1403 299 5610Fax: +1 403 299 5606
dkerr@golder.com • www.golder.com

Mathews, Paul
Ecosign Mountain Resort Planners Ltd.
Box 63, Whistler, BC V0N 1B0 Canada
+1 604 932 5976 Fax: +1 604 932 1897
pmathews@ecosign.com

Chevalier, Chris
Sunshine Village Ski Area
P.O. Box 1510, Banff, AB T1L 1J5 Canada
+1 403 762 6540 Fax: +1 403 762 9199
chevy@skibanff.com
www.skibanff.com

Sunshine Village ski area (Sunshine) is a commercial downhill ski area in Banff National Park, Alberta, Canada. Located in a World Heritage Site, environmental stewardship is a fundamental principal in the design, planning and operations of the ski area. This has been achieved through an integrated approach to ski hill design and operation which applies regional and site-specific environmental assessments to developing ski area facilities. The adoption of best management practices to construction, reclamation and monitoring has been developed over sixty years of ski operations at Sunshine. This paper presents examples of changes in technology and innovation in environmental impact assessment, construction and reclamation practices at Sunshine. Such changes have included the use of high resolution satellite imagery, orthophotos, digital elevation models and detailed ecological land classification to provide a series of databases for ski area planning and environmental assessment. Technological advances have proceeded along with a greater understanding of environmental sensitivities in Alpine and Sub-alpine environments. Lift replacement projects (including the recently renovated main access gondola), buildings, and infrastructure upgrades are used to illustrate how ski area design principles have been combined with environmental sensitivities and environmental management systems in the development of the ski area. The holistic approach to design at Sunshine incorporates environmental considerations into the conceptual design of the entire lease area through to individual components and elements of the facilities. Balancing skier and rider expectations with environmental protection has been achieved with extensive regulatory and public input throughout the planning and approval process. Environmental Management Systems have also been developed to optimize water use and re-cycling, as well as energy conservation measures to lower peak power demands and minimize atmospheric emissions.

Key words: *ski area, environmental assessment, environmental management*

EVALUATING THE EFFECTIVENESS OF EIA: LEARNING FROM RESEARCH ON ITS SUBSTANTIVE OUTCOMES

Cashmore, Matthew; Cobb, Dick; Bond, Alan
InteREAM
School of Environmental Sciences
University of East Anglia
Norwich, Norfolk NR4 7TJ, UK

Gwilliam, Richard
Hyder Consulting (UK) Limited
29 Bressenden Place
London SW1E 5DZ, UK

Morgan, Richard
Centre for Impact Assessment Research and Training (CIART)
Department of Geography
University of Otago
PO Box 56, Dunedin New Zealand

The philosophical concept of effectiveness has been a central theme of the Environmental Impact Assessment (EIA) research agenda in the decades since this decision tool was first enacted. Yet research has focused principally on procedural aspects of effectiveness, to the obfuscation of substantive outcomes. An analysis of those studies that have examined the outcomes of EIA indicates that its contribution to consent and design decisions is limited, due primarily to passive integration with the decision processes it is intended to inform. The contribution of EIA to sustainable development is largely unknown (and perhaps unknowable), but it is hypothesised that EIA makes a more significant contribution to sustainable development than has typically been assumed. This contribution is achieved through a plethora of causal processes, including the emancipation of stakeholders and incremental change in the bureaucracy, commercial organisations and scientific institutions. It is suggested that, in attempting to enhance the substantive outcomes (and hence effectiveness) of EIA, the research agenda should focus increasingly on advancing theory concerning the nature and operation of a broad range of causal processes. The conceptual, methodological and analytical challenges associated with such research are substantial (Bond, 2003), but this approach offers arguably the greatest potential for accurate assessment of, and substantial improvement in, the effectiveness of EIA.

Key words: *environmental impact assessment, effectiveness, theory, decision-making, sustainable development*

RECENT DEVELOPMENTS FOR EIA IMPLEMENTATIONS IN TURKEY: ESTABLISHING EIA CENTER AND SECRORAL APPROXIMATION STRATEGY

Albayrak, Ali, Soylu, Ömer; Satilmis, Mustafa
Ministry of Environment and Forest
Eskisehir Yolu 8.Km. A Blok Kat:1
Ankara, 06530 Turkey
+90 3122879963 Fax: +90 312 2852910
aalbayrak@cevre.gov.tr
osoylu@cevre.gov.tr
msatilmis@cevre.gov.tr
www.cevreorman.gov.tr

The Government of Turkey has almost completed the adoption of the EU Directive for EIA as of 15 December 2003, by enacting a revised EIA regulation. The only aspects of the EU Directive that this new legislation lacks are ratifications of the Aarhus and Espoo Conventions. A project funded by Senter (an entity of the Ministry of Foreign Affairs in The Netherlands), entitled "Approximation and implementation of the EIA Directive in Turkey" was conducted in order to aid in the practical implementation of the EU EIA Directive through the drafting of guidelines and handbooks, the execution of two pilot projects on EIA and SEA, and the provision of training in EIA methodologies, among other activities. In order to provide the regular training through EIA stakeholders, new project "Establishing EIA Training and Information Center" will be implemented for two years starting from January 2004. By the help of this project, sectoral guidelines will be prepared for twelve sectors, training strategy will be prepared and intensive EIA Training will be conducted and EIA assessment techniques other than expert level will also be used in EIA Review Committee such as modelling programmes, using GIS if required, using matrices and overlapping maps. Turkey also increased her effort for the studies of adoption of environmental acquis which focuses on horizontal sector, water management, waste management, and industrial process control. EIA is the main component of the Horizontal sector. First of all, Directive Specific Implementation Plan (DSIP) for EIA, for SEA and for Access to Information about environmental issues has been prepared, and after combining those DSIPs,, Sectoral Approximation Strategy has been prepared focusing on training, institutional capacity, financial mechanisms and timeframe of the activities for a 25- year period. This EU-funded project is also important as being the first sectoral approximation strategy.

Key words: *EIA training center, sectoral approximation strategy, sectoral guidelines, DSIP*

EIA IN THE TOURISM SECTOR IN EGYPT

Abul-Azm, A. G.
Cairo University
1 M Abul-Azm Street
P.O. Box 148 Maadi, Cairo 11431 Egypt
+202 359 3261 Fax: +202 358 760
ecma@access.com.eg

Hassanein, M.
Tourist Development Authority

Hassanein62000@yahoo.com

In February 1994, the Government of Egypt had issued law No.4/94 concerning protection of the environment. The objective of the law was not only addressing pollution measures and control, but also involved new developments and projects including expansions of the existing ones. New establishments are required to carry out an Environmental Impact Assessment (EIA) before construction. Relevant articles in the Executive Regulations, issued by the Prime Ministers decree No.338 of 1995, complement the law. The Egyptian Environmental Affairs Agency (EEAA) is mandated to implement law 4/94 and is responsible for the review and decision making for EIA in Egypt. During the past years, the EIA system had witnessed several developments and improvement not only within the EEAA but also the Competent Administrative Authority or the licensing authority.

In 1994 only 5 EIS had been submitted for review to the EEAA. The numbers had increased drastically in the following years. In the past five years, an average of 350 full fledged EIAs had been submitted to EEAA in the tourism sector alone that represents approximately 35% of the studies submitted to agency.

This paper presents the Egyptian efforts to handle EIA in the tourism sector, including the capacity building in the Tourist Development Authority (TDA) being the competent administrative responsible for the tourist development in Egypt. The paper shall present the history of building up the capacity of the TDA in environmental issues and give a brief analysis of the current situation and what can be done next in order to develop the tourism sector in Egypt sustainably.

Key words: *EIA, tourism sector, Egypt*

GENERATION RATE OF CONSTRUCTION & DEMOLITION DEBRIS DUE TO CONSTRUCTION ACTIVITIES

Lee, Hi Sun
Korea Environmental Institute
613-2 Bulgwang-Dong Eunpyeong-Gu
Seoul 122-706 Korea
+82 2 380 7614 Fax: +82 2 380 7744
leehs@kei.re.kr

To estimate the amount of debris generated during construction activities, basic generation rates on each construction type should be required. Generally there are two ways to get these rates. One is so called a direct method: Based on the actual measurement at the construction site; The other is an indirect method: Using additional material rates in the estimating data of the plan. In a direct method, accurate data could be obtained, but this method costs lots of time and expenses, and the results couldn't be easily generalized in other sites. Therefore, using this method is not considered to be efficient. However, it is relatively easy to obtain the generation rates of debris in an indirect method. Additional material rates mean the supplementary portion of construction material which was reflected in the estimation of material usage, but might be discarded during construction process due to various reasons. During the construction process, accurate amount of material should be needed for a specific process based on the construction plans, and additional amount of material should also be reflected. This additional portion has a high possibility to be discarded during the process, and that amount could be regarded as C&D debris. In addition, the amount of material inputted during building construction is considered to be discharged during demolition process. The amount of C&D debris could be obtained by simply using this concept in EIA. Although various data could be used in determining the amount of C&D debris, not only the amount but also the types of C&D debris discharged should be dealt with importantly when considering the proper treatment of C&D debris. In conclusion, since both methods have both merits and demerits, proper generation rate should be used by considering the each condition of construction activity.

Key words: *C&D debris, generation rate, construction activities, additional material rate*

HEALTHCOUNTS: RELEVANT MEASURES OF DETERMINANTS OF HEALTH - CHOICES MADE BY COMMUNITY AND PROFESSIONAL GROUPS IN A UK SETTING

Mathers, Jonathan
Health Impact Assessment Research Unit
Department of Public Health & Epidemiology
University of Birmingham Edgbaston
Birmingham, West Midlands B15 2TT UK
+44 121 414 6024 Fax: +44 121 414 7878
matherjm@medgp3.bham.ac.uk

Cameron, Elaine
School of Humanities and Social Sciences
University of Wolverhampton
Wolverhampton, West Midlands UK
e.cameron@wlv.ac.uk

Parry, Jayne
Health Impact Assessment Research Unit
Department of Public Health & Epidemiology
University of Birmingham Edgbaston
Birmingham, West Midlands B15 2TT UK
+44 121 414 3191 Fax: +44 121 414 7878
j.m.parry.1@bham.ac.uk

The importance of action upon the broader determinants of health and well-being, for health improvement and reductions in health inequalities, is now widely recognised. In the UK and elsewhere, Health Impact Assessment (HIA) has been identified as one methodology by which this action can be facilitated. There is a consequent need to identify appropriate measures that profile determinants, both to monitor policy impacts and for use in methodologies such as

HIA. At present it is unclear which measures are best used to monitor and assess influences on health. The HealthCounts project has explored people's concepts of (a) health, illness and well-being and (b) the important determinants of health, illness and well-being. Using these conceptions, HealthCounts has enabled participants to assess those measures that are routinely available in the UK that relate to factors that influence health, illness and well-being. In order to explore the issues outlined above consultation exercises were conducted with a range of community groups and professionals in the Shropshire and Black Country areas of the UK. This was done through the use of focus groups and key informant interviews. During the process participants were asked to assess measures and indicators that relate to their conceptions of health determinants. The measures used were from an inventory of UK based routine datasets compiled especially for the project. HealthCounts was able to explore commonalities and disparities in the concepts of health and influences on health expressed by community members and professionals, and in the choices made concerning appropriate measures and indicators. The findings from the project will be of direct relevance to stakeholders choosing measures and indicators that relate to determinants of health.

Key words: *determinants of health, measures, indicators, health impact assessment*

ENVIRONMENTAL AND RISK ASSESSMENT FOR THE EXPANSION OF EURALLUMINA RED MUD BASIN IN SARDINIA (ITALY)

Mezzalama, Roberto
Golder Associates
Via Banfo 43, Torino, Piemonte, 10155 Italy
+39011233348 Fax: +39011856950
rmezzalama@golder.it
www.golder.com

Fiore, Maurizio
ART Studio
Corso Francia 197, Rivoli, Piemonte 10098 Italy
+390119571802 Fax: +390119571802
fiore.art@tiscali.it

Rosino, Vincenzo
Eurallumina Spa
casella postale 64, Portoscuso, Sardinia 09010 Italy
+3907815112 Fax: +3907815122228
segreteria.direzione@eurallumina.com
www.eurallumina.com

Eurallumina is the largest plant in Italy for the production of alumina from bauxite. The plant is located in the industrial area of the Portoscuso Village, in the south west of Sardinia. In this area several plants for the production of different metals (aluminum, lead, zinc) and associated facilities (power plants, conveyor belts, harbor, storage areas, etc.) were constructed commencing in the '60s. The area has been included by the national government in the list of "Sites of National Interest" for the severity of historical contamination of soil, groundwater, and air due to the high concentration of industrial facilities. Adjacent to the contaminated area there is a coastal wetland that hosts a number of endangered species and has been included in the list of "Sites of Community Interest" according to the EU Habitat Directive. Eurallumina owns and manages an evaporating pond for the storage of the red muds resulting from the production of alumina from bauxite using the Bayer technology, based on wet processing of bauxite at very high pH. Initially red muds were stored in an unconfined, unlined area and then in an engineered basin that has been in activity since 1974. The existing basin is being filled and Eurallumina requires additional volume for the disposal of red mud for a future period of at least 15 years. Chosen was lateral expansion in an area that was previously used for the disposal of materials dredged from the industrial harbor, and therefore is contaminated, and is located adjacent to the protected wetland. Golder Associates and ART Studio performed a number of baseline studies including soil and groundwater contamination investigation and modelling and the dust modeling. These studies have been coordinated into a formal Environmental Impact Studies.

Key words: *contamination of soil, groundwater, and air, red mud basin, coastal wetlands*

MOVING THE EMP FROM THE SHELF TO THE FIELD IN SHELL PETROLEUM DEVELOPMENT COMPANY, NIGERIA

Dada, Oritsetimeyin, J.; Akpandara, Okubokimi
Shell Petroleum Development Company of Nigeria Limited
Environmental Assessment Department
P.O.Box 263, Port Harcourt, Rivers State, Nigeria
+234 084 4 24039 Fax: +234 084 237127 24756
oti.dada@shell.com
okubokimi.akpandara@shell.com

In less than a decade, Environmental Impact Assessment (EIA) has become established in Nigeria and has rapidly stimulated growth in public awareness as regards environmental issues. However, the success or failure of any EIA depends on the effective implementation of the Environmental Management Plan (EMP). The EMP is a strategic tool that specifies guidelines and procedures for managing the significant adverse impacts of a proposed project when the proposed activity is actually executed.

In the period 1997 - 2002, thirty projects in Shell Petroleum Development Company's Eastern Division (SPDC-E) obtained regulatory approvals for their EIAs with EMP implementation as a requirement. Only three of these projects have records of EMP implementation that commenced late in the construction phase. The factors hindering effective EMP implementation in SPDC-E include a lack of commitment by project managers, poor understanding of the EMP by the project HSE focal point,

poor EMP content, weak internal and external monitoring of EMP, and no financial commitment for EMP implementation.

This poor record indicates that there is a gap between the theory and the practical implementation of the EMP. This shortcoming has been identified and the new SPDC EIA process manual has put in place measures to address it. The manual requires that the EMP be extracted from the EIA as a stand alone-document and endorsed by respective project managers indicating acceptance.

This paper gives details of the measures taken by SPDC to ensure that EMP implementation becomes a key aspect of every project, the challenges faced and areas for improvement. Also, the paper presents a case study of the EMP implementation for the Cawthorne Channel Associated Gas Gathering project.

Key words: *environmental impact assessment, environmental management plan, implementation, Shell Petroleum Development Company, associated gas gathering*

EIA AS AN INTEGRAL TOOL OF AN ECOSYSTEMS APPROACH TO URBAN DEVELOPMENT

Dalfelt, Arne
Norwegian Institute for Urban and Regional Research
Postboks 44, Blindern, 0313 Oslo, Norway
+47 22958800/direct: +47 22958984
Fax: +47 22607774
arne.dalfelt@nibr.no • www.nibr.no

Urban development in developing countries is to a significant extent characterized by an uncontrolled influx of poor peasants from rural areas to slum areas in major cities, seeking work in industries and urban businesses. Most of these slums are breeding grounds for diseases, crime and sustained poverty. Systemic environmental problems ranging from poor health due to lack of access to clean water supply and sanitation, to vehicular related local air pollution and climate change can be traced to patterns of industrial activities and growth of cities. Towns and cities will increasingly be the locations where human activities and their associated ecological impacts can be best met with policy and planning responses (UNU/IAS). To reduce these pressures on municipalities and governments there is an urgent need to enhance practical and decentralized urban environmental management policies and strategies, and to improve assessments through capacity building, partnership development, demonstration projects, and knowledge sharing.

This paper focuses on the use of EIA and SEA as integral development tools for an ecosystem approach to urban development. The ecosystem approach is defined as a comprehensive and holistic approach to anticipated environmental change, and aims to assess and mitigate the full range of impacts of urban development, and to mainstream environmental issues in local development policies and to address linkages between poverty and environment. An ecosystem approach recognizes the interconnections among component parts, and also recognizes that humans are an integral part of this and that human social and economic systems constantly interact with other physical and biological parts of the system. Upstream and early application of adaptive environmental impacts assessments procedures in urban planning is key to sound and sustainable development.

Key words: *ecosystems approach, urban ecosystems, urban development, capacity building, strategic environmental assessment, developing countries*

THE ROLE OF PROJECT INSPECTION IN THE IMPACT ASSESSMENT FOLLOW-UP AND MONITORING PROCESS. A CASE STUDY OF THE WORLD BANK INSPECTION PANEL AND THE CHAD CAMEROON OILFIELD AND PIPELINE PROJECT

Scott-Brown, Miles
Integrated Environments
221, 2451 Dieppe Ave SW, Calgary, AB T3B 0M6 Canada
miles_scott-brown@praxis.ca

Ninio, Alberto
World Bank
1818 H St., Washington, DC USA
aninio@worldbank.org

Fratkin, Elliot
Smith College
Northhampton, MA USA
efratkin@email.smith.edu

The World Bank Inspection Panel was created in 1993 to ensure compliance of World Bank projects with the Bank's social and environmental safeguard policies and to provide private citizens an independent forum to determine whether they or their interests have been harmed by projects financed by the World Bank. The Panel is the first body of its kind to give affected individuals a voice in how and if international development projects proceed and in turn has established a process for accountability at the World Bank.

The paper will discuss the role of project inspection and contrast it with other IA follow-up procedures such as compliance monitoring, auditing and evaluation of project environmental assessment documentation. This will be evaluated within the context of the recent Panel inspection of the Chad Cameroon Oilfield and Pipeline Development project. Both social and environmental aspects will be considered.

Challenges in the inspection process will be examined such as eligibility of requests, time and budgetary constraints in the investigation process, relationship with other follow-up procedures and the implementation of panel findings. The authors conclude that inspection is a useful tool in the toolbox of IA follow-up techniques but has a very different application and purpose than other compliance mechanisms.

Key words: *impact assessment, follow-up, compliance monitoring, inspection*

EVALUATION DE LA QUALITE DU RESEAU HYDROGRAPHIQUE DE LA REGION DE MEKNES (MAROC)

M'hamed Khaffou
Association Marocaine d'Ornithologie
29, ru Elmàarka, Zitoune, Meknes
Zitoune, Meknes 50 000 Maroc
+212 70 62 35 67 Fax: +212 55 52 66 24
mhndachich@yahoo.fr

Le déversement des déchets liquides dans la nature, en particulier dans le réseau hydrographique a des impacts négatifs sur la santé et l'environnement, cela se manifeste par une détérioration de la qualité biologique, physico-chimique et bactériologique des cours d'eaux récepteurs et la circulation des maladies hydriques. Meknès est une grande ville renferme une activité industriel, agricole et d'élevage intense. Les déchets liquides issues des activités sus-cités sont drainés par le réseau d'assainissement liquides, et rejetés directement sans traitement préalable dans le réseau hydrographique. Meknès une ville non cotiere. Les oueds qui traversent cette ville sont de faible débit parfois nul en période d'étiage.l'utilisation des eaux pour l'irrigation, entraîne une réduction du pouvoir autoépuratoire des oueds. L'apport des rejets à l'intérieur de la ville provoque une altération des caractères physico-chimiques, organoleptiques et biologiques de ces eaux. Malheureusement ces eaux sont utilisées pour l'irrigation des cultures arborescentes et maraîchères Notre étude aura pour objectif de donner une aperçu sur les principaux rejets polluants industriels qui gagnent le réseau hydrographique de la région de Meknès (Produits phytosanitaires, métaux lourdes, poly phénols,...) en augmentant le nombre de point de prélèvement et le nombre d'analyses dans la région (puits, sources, oueds, barrages....) et dans un deuxième temps de rechercher des bio-indicateurs (macro-invertébrés, bactéries, levures, hydrovirus ...) pouvant nous renseignés sur la qualité de ces eaux, ces deux axes de recherche se débouchant sur la recherche des micro-polluants (métaux lourds, poly phénols,.....).

Key words: *impact environnemental, dbo, dco, poly phénols, métaux lourdes, hydro virus, maladies pa*

PARTNERING TO SUCCESS: ACHIEVING OPTIMISATION THROUGH APPROPRIATENESS

Witchalls, Ben
BP
Maddox Farm Little Bookham Street
Leatherhead, Surrey KT23 3BU UK
+44 1932 739 409
witcb1@bp.com • www.bp.com

Sustainable development is about recognising the finality of the resources we have and targeting them for the most effective use. This means getting the best value out of what you put in - the primary aim of every organisation, especially business. Deciding what goes into an integrated environmental and social impact assessment (ESIA) is a challenge, deciding how to use the outcomes and recommendations are, in many cases, even more challenging. Having established the potential impact, the consequent significance has to be determined. In turn this significance can inform decision-makers of the most appropriate action that can be taken. Developing an 'appropriateness assessment' is the only way forward for optimising performance on a project. Decisions have to be made based on a clear understanding of the changing sensitivities and expectations associated to a project site. Many companies, including BP, have previously shot themselves in the foot by raising expectations due to the rhetoric they use, but then being unable to meet them. This leads to disappointment and tarnished reputation, irrespective of whether the project did in fact outperform its peers from a social and environmental perspective. The subjectivity of varying sensitivities and expectations requires both input and influence of major stakeholders across the three sectors of non-governmental, Government and business. This should be beyond the 'what' of what goes into an ESIA, but extend also to sharing the risks and accountabilities of 'how' an ESIA is used. The world summit in Johannesburg last year has given increased legitimacy and a resource base to cross sector partnerships. The ESIA process should be welcoming this as a positive step forward to better understanding, managing and responding to social and environmental sensitivities and stakeholder expectations, and thus making the best use of the finite resources it has as its disposal.

Key words: *sensitivity, expectations, appropriate, cross-sector partnerships*

APPLICATION OF RISK ASSESSMENT PRINCIPLES TO THE ASSESSMENT OF IMPACTS ON FISH HEALTH FROM OIL SANDS DEVELOPMENT: HOW SAFE IS SAFE ENOUGH?

Swanson, Stella; Ramesh, Geetha
Golder Associates Ltd.
940 Sixth Avenue S.W., Calgary, AB T2P 3T1 Canada
+1 403 299 5600 Fax: +1 403 299 5606
stella_swanson@golder.com
geetha_ramesh@golder.com

The standard approach used for assessing risks to fish health in the oil sands region of northeastern Alberta is adopted from the well-known and accepted risk assessment framework. This approach requires that answers be provided to the following three questions: (1) How safe is it? (2) How sure are we? and (3) Is that acceptable? Answering the first question requires a rigorous, step-by-step process that includes screening of chemicals of concern, selection of appropriate fish species to act as indicators, examining not only the magnitude, but also the frequency, duration and extent of exposure, and then assembling a weight of evidence from models, toxicity tests and field-based investigations. Answering the second question requires a

transparent approach to addressing the three primary sources of uncertainty: natural variability, ignorance and measurement error. Addressing uncertainty can include the use of deliberately conservative assumptions to ensure that risks are not underestimated. Probabilistic exposure estimates are excellent tools that help account for natural variability. It is essential that the assessment address uncertainty in a manner that facilitates decision-making; this requires clear and concise information targetted at the "but what if we are wrong" question. Answering the third question requires input from the public and regulators. Obtaining information on the definitions of acceptable risk prior to conducting the assessment will help ensure that the results of the risk assessment are placed in the appropriate context. An illustrative example from a recent oil sands EIA will be presented.

Key words: *risk, fish, health, oil sand, screening, chemicals indicators, magnitude, frequency, duration, extent, exposure*

CONSTRAINTS MAPPING AT A SAGD FACILITY IN THE OIL SANDS REGION OF NORTHERN ALBERTA

Fawcett, Kym; Gilchrist, Ian
Golder Associates Ltd.
940 Sixth Avenue S.W., Calgary, AB T2P 3T1 Canada
+1 403 299 5600 Fax: +1 403 299 5606
kym_fawcett@golder.com
ian_gilchrist@golder.com

Burt, Michael
OPTI Canada, Inc.
Suite 2250, 520 - 5th Avenue S.W.
Calgary, AB, T2P 3R7 Canada
+1 403 218 4706 Fax: +1 403 225 2606
mburt@opticanada.com

OPTI Canada Inc./Nexen Canada Ltd. (OPTI/Nexen) developed a constraints map for their proposed Steam Assisted Gravity Drainage (SAGD) project near Anzac, Alberta. Constraints mapping is a graphical representation of the suitability of a land area for construction purposes. The objective of a constraints map is to provide information that will allow reduction of a project's footprint in areas of higher constraint to trigger elevated levels of site mitigation and avoid "no-go" areas. OPTI/Nexen used the constraints map as a key planning tool during the conceptual and detailed design phase for their project to balance the placement of surface facilities with environmental and cultural land use sensitivities. A constraints map is a dynamic tool that can be used over the lifetime of a project, from initial screening at the beginning to detailed facility siting for future phase updates. Constraints maps take into consideration regulatory requirements; raw data such as disturbances, wetlands, field survey data, traditional use, historical sites, soils and air photos as well as derived data such as wildlife Habitat Suitability Index modelling results. They may also include subsurface environmental, surficial and subsurface engineering and temporal constraints. Fundamentally, constraints mapping utilizes the same information as the Environmental Assessment process, however it processes the information in a slightly different manner.

Key words: *steam assisted gravity drainage, SAGD, constraints, map, suitability, graphical, sensitivities, environmental, cultural, temporal, engineering, mapping*

AN APPLICATION OF THE HYDROLOGIC SIMULATION PROGRAM FORTRAN (HSPF) MODEL TO TWO LARGE SCALE ENVIRONMENTAL IMPACT ASSESSMENTS IN NORTHEASTERN ALBERTA, CANADA

Beersing, Anil; Schmidt, Nathan; Kampala, Benjamin
Golder Associates Ltd.
940 Sixth Avenue S.W., Calgary, AB T2P 3T1 Canada
+1 403 299 5600 Fax: +1 403 299 5606
anil_beersing@golder.com
nathan_schmidt@golder.com
benjamin_kampala@golder.com

Oil sands mining development in northeastern Alberta results in changes in local watersheds including changes in water balance, waterbody surface elevations and discharges, basin sediment yields, stream geomorphology and drainage patterns. These changes are significant to those interested in assessing project effects on the hydrologic resources of the region as well as those whose concern lies with maintaining water quality and aquatic ecosystems.

The Hydrological Simulation Program FORTRAN (HSPF) model, which was developed by the US EPA, is a state-of-the-art tool for predicting continuous hydrologic and water quality data series based on historical climate data, surficial geology and human activity in a particular watershed. The model is flexible in its data management features and can be applied to a wide range of dynamic water quantity and quality problems. Hydrologic issues of interest to regulators, operators and stakeholders are the effects of regime change on water quality, fish habitat and river geomorphology.

In the assessment of the Canadian Natural Horizon and Shell Jackpine Mine - Phase 1 Oil Sands Projects, Golder Associates used the HSPF model to assess the hydrologic responses of surface waterbodies to the proposed physical changes to local watersheds. This paper discusses the calibration of the model for northeastern Alberta and the results obtained from its application to a large environmental impact assessment. The benefits of using HSPF over previous assessment methods will also be discussed.

Key words: *Oil Sands, watershed, water balance, water, basin sediment yield, Hydrologic Simulation Program Fortran, HSPF, water quality, model*

A DISCUSSION ON THE COMPLETION OF CUMULATIVE EFFECTS ASSESSMENTS (CEAS) IN THE OIL SANDS REGION

Gulley, John R.
Golder Associates Ltd.
1000 - 940 - 6th Avenue S.W.
Calgary, AB T2P 3T1 Canada
+1 403 299 5640 +1 403 299 5606
jgulley@golder.com

Mackenzie, Ian B.
Golder Associates Ltd.
+1 403 299 5616 Fax: +1 403 299 5606
imackenzie@golder.com

Fordham, Chris
Suncor Energy Inc.
P.O. Box 38, 112 - 4th Avenue S.W.
Calgary, AB T2P 2V5 Canada
+1 403 205 6862 Fax: +1 403 269 6214
cfordham@suncor.com

Smith, Judy A.
Shell Canada Limited
400 - 4th Avenue S.W., Calgary, AB T2P 2H5 Canada
+1 403 691 2113 Fax: +1 403 691 3415
judy.smith@shell.ca

Duane, Calvin
Canadian Natural
900 – 311 6th Avenue SW., Calgary, AB Canada
+1 403 514 7567 Fax: +1 403 517 7367
Calvin.Duane@cnrl.com

Cumulative Effects Assessments (CEA) are an integral component of Environmental Impact Assessments (EIA) completed by Golder Associates Ltd (Golder) together with its oil sands clients—Suncor, Canadian Natural, Shell and others. The approach has been to prepare an integrated EIA that includes a defensible, comprehensive CEA for the application of each project, while meeting both federal (e.g., Canadian Environmental Assessment Act—CEAA) and provincial assessment requirements.

The EIAs include a Planned Development Case assessment, which considers existing and approved projects, the project being assessed as well as other developments planned for the future. Although most planned developments have not yet been subject to formal approval applications, they are included because if they were to proceed, they could result in additional environmental impacts in the development area. The CEAA states that the planned developments should be "reasonably foreseeable projects and activities." Including speculative projects beyond this regulatory requirement renders assessments less accurate and therefore less useful for the regulators, the proponent and other stakeholders. To limit inclusion of speculative projects, most oil sands EIA's include only those projects that have been publicly disclosed six months prior to EIA submission. While this does not eliminate projects that will never be operated, public disclosure does suggest a certain level of commitment to project construction.

Even though all planned development projects have been publicly disclosed, there are often limitations on the level of detailed information available to include in the assessment. This uncertainty is reduced by using conservative assumptions based on information from existing operations. In subsequent EIAs, some of the planned developments become approved and existing developments, with increased accuracy of data to reduce conservatism.

Key words: *cumulative effects assessments (CEAS), Oil Sands, planned developments, conservative assumptions*

AN APPLICATION OF THE HYDROLOGIC SIMULATION PROGRAM FORTRAN (HSPF) MODEL TO TWO WATER QUALITY ASSESSMENTS IN LARGE SCALE ENVIRONMENTAL IMPACT ASSESSMENTS IN NORTHEASTERN ALBERTA, CANADA

Takyi, Andrews; Mackenzie, Ian; Kampala, Benjamin
Golder Associates Ltd.
940 Sixth Avenue S.W., Calgary, AB T2P 3T1 Canada
+1 403)299 5600 Fax: +1 403 299 5606
andrews_takyi@golder.com
ian_mackenzie@golder.com
benjamin_kampala@golder.com

Oil sands mining development in northeastern Alberta result in changes in local watersheds including changes in water balance, water level and discharges, basin sediment yields, stream channel erosion, drainage patterns, water conveyance and storage facilities. These changes may alter water quality and thermal regimes of surface waterbodies.

Prior to 2001, assessments of water quality impacts of oil sands developments on small streams in northeastern Alberta have been based on a simple, steady-state mixing model. The steady-state model typically utilizes 7Q10 low flow, mean open water flow and observed maximum concentrations of mine release water to predict water quality impacts under median background substance concentrations during winter and open-water conditions. Drawbacks to this approach are that the simple mixing model does not provide a complete representation of the stream water fluctuations, and typically produces highly conservative results. Thus, potential oil sands developments in northeastern Alberta could otherwise be constrained by conservative predictions of water quality impacts based on the simple, steady-state model. Therefore, the recent increase in the number of existing, approved, and planned oil sands development projects call for more sophisticated and realistic dynamic models, such as the Hydrological Simulation Program FORTRAN (HSPF).

The HSPF model is a state-of-the-art tool for predicting continuous hydrologic and water quality data series based on historic climatic information, surficial geology and human activity in a particular watershed. After having completed a comprehensive calibration of the HSPF model in the Athabasca oil sands region of Alberta, Golder Associates has recently applied the model to two large scale oil sands

developments' environmental impact assessments (EIA). This paper will discuss the results obtained from simulations used to predict water quality as a result of the Canadian Natural Horizon and Shell Jackpine Mine - Phase 1 Projects.
Key words: *Oil Sands, watershed, water balance, water, basin sediment yield, thermal regimes, Hydrologic Simulation Program Fortran, HSPF, water quality, dynamic*

EA FOLLOW-UP IN GHANA (AFRICA)

Afoom, Renee
York University
4 Assiniboine Road Apt 307
Toronto ON M3J 1L2 Canada
+1 416 650 2969
mikii14@yorku.ca

EA follow-up is an essential component of the environmental assessment process. The EA follow-up process generally entails monitoring, evaluating and managing of actual project impacts on the environment. By acting as a feedback mechanism, the EA follow-up process provides a means for transferring lessons learned from field experiences into the EA practice. In spite of its obvious importance, research in Africa and in Ghana suggests that EA follow-up is an option rather than a rule in the EA process. Why? There are several difficulties facing the entire EA process; particularly in the area of local involvement, local capacity and baseline information. As a result, most EAs undertaken in Africa concentrate on the impact predicting stages of the EA process, with minimal consideration for project follow-up and impact evaluation. This paper examines EA follow-up options for Ghana and provides a framework and recommendations for effectively undertaking EA follow-up. Based on three EA challenge areas–local involvement, local capacity and baseline information–the paper suggests a medium for translating these challenge areas into avenues to facilitate the EA follow-up process in Ghana. The paper employs EA follow-up programs and case studies from different jurisdictions including Canada, Africa, Asia and Australia. In summary, this paper promotes the idea that there are opportunities within the EA challenges, which could be harnessed to further improve the effectiveness of the EA process in Ghana and Africa as a whole.

Key words: *EA follow-up, local involvement, local capacity, baseline information*

SOCIAL IMPACT ASSESSMENT AND OFFSHORE OIL AND GAS IN THE GULF OF MEXICO REGION

Cook, Kimberley
Minerals Management Service
1201 Elmwood Park Blvd. , New Orleans, LA 70123 USA
+1 504 736 1720 Fax: +1 504 736 2407
kimberley.cook@mms.gov

Luthra, Ahsa
Minerals Management Service
+1 504 731 7850 Fax: +1 504 736 2407
asha.luthra@mms.gov

On February 3-5, 2004, the Minerals Management Service held a socioeconomic workshop for the Gulf of Mexico Region. We addressed social impact assessment topics in this region including fiscal, industry, and cultural effects. Our paper will present some of our new research directions and ideas that resulted from breakout session discussions. More specifically, this session will address the theoretical and methodological challenges faced when using the classic SIA paradigm in the Gulf of Mexico Region. With approximately 4,000 producing platforms contributing to 30% of the nation's oil supply, this region illustrates the challenges of SIA research due to its complexity, magnitude, and longevity. We use fiscal/infrastructural and cultural variables to illustrate our challenges such as identifying the affected area, the nature of effects, and the difficulty of establishing the baseline and cumulative effects. These variables crosscut all industry sectors and communities. Fiscal and infrastructure effects of the industry include resources such as tourism, recreation, schools, transportation, social services, and public revenues. Since past SIA research in the Gulf has focused primarily on rural areas, we will examine urban communities affected by the oil and gas industry. Our study of culture is meant to: 1) identify the affected populations and cultures in the Gulf of Mexico Region; 2) develop methods for assessing cumulative impacts on these groups; 3) investigate the relationship between industry sector demands and impacts on uniform features of culture; and 4) uncover current environmental justice concerns for the region. Although our research addresses challenges specific to the oil and gas industry in the Gulf of Mexico region, the findings also have implications for social impact assessment in other complex contexts.

Key words: *SIA, oil industry, Gulf of Mexico, culture, infrastructure*

GULF OF MEXICO CHALLENGES

Luton, Harry
MMS
1201 Elmood Park Blvd. MS-5430
New Orleans, LA 70123-2394 USA
+1 504 736 2784
Harry.Luton@mms.gov

Austin, Diane
University of Arizona
P.O. Box 210030, Tucson, AZ 85721-0030 USA
+1 520 626 3879 Fax: +1 520 621 9608
daustin@u.arizona.edu

Offshore oil and gas activity began in the Gulf of Mexico in the 1940s. Rather than a sudden, radical event, offshore oil and gas development continued the evolution of the oil and gas industry from solid land into marshes, swamps, lakes, and finally the open waters of the Gulf. Since that time, the march has continued into deeper water and to distances farther from shore. Onshore, supply bases, fabrication yards,

and ports have been constructed or modified to meet the needs of inland, inshore, and offshore fields. The ongoing evolution of the industry has meant that the effects of offshore oil and gas activity have changed over time. For example, larger platforms require larger workboats; larger workboats require operators with specialized skills and licenses; longer distances mean concentrated work schedules. As a result of both complexity and longevity, the impacts of the offshore oil and gas industry in the Gulf of Mexico cannot be effectively captured with standard SIA methods and frameworks. This paper describes the challenges and the evolution of a new approach to SIA in the MMS Gulf of Mexico Region.

Key words: *SIA, cumulative, challenges*

EIA FOLLOW UP PROCEDURES IN TURKEY: CURRENT SITUATION AND FUTURE OUTLOOK

Albayrak, Ali; Soylu, Ömer; Aytaç, Mustafa
Ministry of Environment and Forest
Eskisehir Yolu 8.Km. A Blok Kat:1
Ankara 06530 Turkey
+90 312 2879963 Fax: +90 312 2852910
aalbayrak@cevre.gov.tr
osoylu@cevre.gov.tr
reorman.gov.tr
maytac@cevre.gov.tr
www.cevreorman.gov.tr

EIA regulation has been implemented in Turkey since 1993. After becoming a candidate country for the European Union, Turkey has increased her effort through approximation studies, including the EIA implementations. Turkey is a centralised country for public administration and most of the EIA process has been controlled and implemented by the Ministry of Environment and Forest, The General Directorate of EIA and Planning. In order to implement the EIA Regulation in the same sense, there is a need to have sectoral guidelines for main sectors. In order to provide for arranging regular training programs and for preparing remaining EIA guidelines, the Ministry of Environment has decided to establish EIA Training and Information Centre in January 2004. EIA follow-up process is a separate department and annually selected EIA projects in 81 province are inspected by the experts. Before going to the project site, the EIA Report has been assessed by the inspector considering the specific properties of the project, process used, air pollution, emissions, other related environmental permits, waste, noise, water usage and water pollution, reclamation process if applicable, etc. and it is controlled on site. Although general guidelines exist that are used for this purpose, sector-specific guidelines are needed and sector-specific training should be conducted. This paper indicates current EIA Process and current environmental follow-up procedures vs. current EIA follow up procedures in Turkey and the challenges for better implementing of EIA Follow-up process.

Key words: *EIA follow-up process, EIA process, inspector, sectoral guidelines, follow-up procedures*

IMPLEMENTING SUSTAINABLE DEVELOPMENT USING THE PUBLICLY ACCOUNTABLE DEVELOPMENT MODEL

Banister, Ken
Alberta Energy and Utilities Board
297 4786 Fax: 297 2691
ken.banister@gov.ab.ca

Goodman, Tristan
Compliance and Operations Branch of the Alberta Energy and Utilities Board
tristan.goodman@gov.ab.ca

Few people today would argue that sustainable development is, in theory, a noble cause. However, despite its broad acceptance, there are problems with its practical application and implementation. Notwithstanding the stories of success, in many industries there is still a gap between the philosophies of sustainable development and their execution. This paper presents a model for implementing the principles of sustainable development in an organizational setting.

Accountable Development (AD) is a strategy-based model for the implementation of sustainable development. Drawing on business, social and environmental inputs, organizations can custom tune the model's parameters to develop advantages in achieving the organization's goals; whether the goals are financial, customer, shareholder or market position focused.

Starting with an organization's values, AD integrates the key principles of sustainable development, the driving forces of business or government, the use of appropriate environmental tools, corporate social responsibility and industry recommended practices, to provide verifiable reporting indicators. Using customized input criteria, the AD model is flexible enough to allow decision makers to evaluate environmental choices in the context of the organization's needs, and produces a reporting matrix that reflect the values of the organization.

As an organization-specific method, AD can be easily adopted for implementation by various types of organizations to realize operational goals and higher-level institutional strategy.

Key words: *sustainable development, business strategy, accountable development, environmental management, reporting*

INFLUENCE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS OF INFRASTRUCTURE PROJECTS IN THE CONSERVATION AND STUDY OF CULTURAL AND HISTORICAL HERITAGE IN SPAIN FROM 1990 TO 2003

Arce-Ruiz, Rosa M.
Department of Regional and Urban Planning and Environment
Faculty of Civil Engineering
Politechnic University of Madrid
Escuela T.S. Ingenieros de Caminos, C.P.
Profesor Aranguren, s/n.
Ciudad Universitaria 28040 Madrid, Spain
+34 91 3 49 56 87 Fax: +34 91 5 54 23 94
rarce@caminos.recol.es

Prevention of negative environmental impacts has been integrated in design and construction of linear infrastructures in Spain since 1988, the year that the national EIA Law (R.D.L. 1302/86) took effect. Cultural and historical heritage protection were mentioned in the Article 2 of the Law.

Historical and archaeological heritage are the principal witness of the historical evolution and the identity of a society and its contribution to universal civilization. The set of goods, elements and costumes characteristic of a society are included in this concept.

In a great proportion, the Environmental Impact Studies of lineal infrastructure projects in Spain since 1990 have considered necessary some type of control or archaeological intervention during the project and, later, during the works. For this reason, it follows that it is of big interest to evaluate the impact of this EIA process over the study and the recuperation of the historical and the archaeological heritage.

The experience of the last fifteen years constitutes a good perspective to analyse the results. This paper highlights the results of a research about the effectiveness of EIA process in protecting and studying the archaeological heritage in Spain

Key words: *cultural, historical heritage impacts assessment, projects, infrastructure*

FAST-TRACK ENVIRONMENTAL ASSESSMENT AND PERMITTING IN THE ROCKY MOUNTAIN WEST, USA

Aronson, John
AATA International, Inc.
736 Whalers Way F-200, Fort Collins, CO 80525 USA
+1 970 223 1333 Fax: +1 970 223 9115
jga@aata.com • www.aata.info

Fowler, Bill
Anadarko Petroleum Corporation
1201 Lake Robbins Drive, P.O. Box 1330
The Woodlands, TX 77380 USA
+1 832 636 3167 Fax: +1 832 636 5565
bill_fowler@anadarko.com • www.anadarko.com

Fast-track environmental assessment and permitting in the Rocky Mountain West has come under more focus of late due to the increased oil and gas exploration and production activities occurring throughout the region. Operators compete for valuable regulatory agency time and attention, project proponents want to move more quickly and information overload can bog down even the most carefully planned approval cycles. The need to meet NEPA requirements, involve the public, and gain important field and laboratory data for site-specific analysis often puts tremendous pressure upon fast moving projects. This paper explores some recent lessons learned regarding fast-track environmental assessment and permitting, and provides insight into some of the most recent methods for achieving high environmental integrity for rapidly evolving projects, such as rapid ecological assessment, web-based environmental management systems, remote sensing, and advanced multi-track project planning. A recent program to advance tertiary recovery of oil using CO2 injection at the Salt Creek Field, Wyoming is discussed in some detail as it involved Bureau of Land Management assessment and approval.

Key words: *EIA, EA, fast-track, impact assessment, permitting, Wyoming, CO2, USA, NEPA*

EMERGING ISSUES IN ENVIRONMENTAL ASSESSMENT OF WIND ENERGY FACILITIES

Linehan, Andy
CH2M HILL
Suite 1300, 825 NE Multnomah Blvd.
Portland, OR 97232 USA
+1 503 235 5000 Fax: +1 503 736 2010
alinehan@ch2m.com
www.ch2m.com

As wind projects are being developed in an increasing number of jurisdictions, with widely varying settings and often in closer proximity to residential and urban areas, permitting agencies must address new land use and environmental issues. Among the issues that are taking on increased significance are the following:

- Property Set-backs. Some land use agencies require that turbines be set back from property boundaries with the stated purposes of safety and the protection of down-wind landowners' "wind rights."

What types of set-backs are being specified around the country and what are the underlying land use and legal principles behind these decisions?

- Cumulative Effects Analysis. The United States' National Environmental Policy Act (NEPA) and some state-level environmental review statutes require that the cumulative effects of proposed and reasonably foreseeable actions be evaluated for their effects on natural and human resources. Recently, some stakeholders have advocated that environmental review of wind projects address the cumulative effect of development on regions, states, or the nation. What are appropriate ways to address cumulative effects of wind projects?
- Noise: In the past, noise has primarily been an issue in rural residential areas where houses are sited nearby. In a few jurisdictions, such as the states of Oregon and California, compliance with ambient noise standards has proven very difficult, prompting efforts to review and revise noise regulations as they pertain to wind projects. This presentation will review the status of emerging issues in wind project permitting and identify tools and precedents that can help guide the assessment of wind energy projects.

Key words: *wind energy, cumulative impacts, noise, land use*

A NEW APPROACH TO INDIGENOUS PARTICIPATION IN THE ENVIRONMENTAL ASSESSMENT OF A MAJOR HYDRO-DEVELOPMENT: THE CASE OF THE EM-1-A AND RUPERT RIVER DIVERSION

Lévesque, Carole
Institut national de la recherche scientifique
3465, rue Durocher, Montréal, QC H2X 2C6 Canada
+1 514 499 4094 Fax: +1 514 499 4065
carole.levesque@inrs-ucs.uquebec.ca

Lajoie, Ginette
Cree Regional Authority
277 rue Duke, Montréal, QC H3C 2M2 Canada
+1 514 861 5837
glajoie@gcc.ca

The Cree First Nation of Eeyou Istchee (eastern James Bay) entered into a set of agreements in 2002 regarding a new major hydro-electric development project. One of these agreements involves a direct participation of the Cree communities in the studies leading to the preparation of the EIS that the proponents (Hydro-Québec and James Bay Energy Corporation) must submit to the review process. Another agreement, this one with the provincial and federal governments provides a new framework for the harmonization of environmental review processes, a first in almost 30 years of hydro-electric development in northern Québec. Although familiar with joint environmental review procedures since 1978 through their direct participation on the permanent environmental boards, the Crees had never before devoted such a level of effort with a proponent to develop the capacities at the community level to partake in the environmental studies, upstream from the review process. They are also actively pursuing means of disseminating the information gathered from these studies. Two years into the implementation of these agreements, our research is looking at the role of the communication and discussion activities surrounding field studies in connection with the project; the extent to which these activities are community-based; the nature of the contribution of the communities to the social and environmental impact assessment. Based on empirical data gathered through individual interviews and focus group discussions in four Cree communities during Fall 2003 and Winter 2004 we will evaluate how efficient this new approach has been so far.

Key words: *Cree First Nation, hydro-development, environmental review, public involvement*

SECTORAL ENVIRONMENTAL ASSESSMENT IN MEXICO: A METHODOLOGICAL APPROACH

Pisanty-Levy, Julieta
Environmental Consultant
Horacio N° 1834-301, Col. Polanco, C.P. 11550, Mexico, D.F., Mexico.
Phone/Fax: +52 (55) 52-80-95-95
andermann@prodigy.net.mx
julietapisanty@hotmail.com

Strategic Environmental Assessment (SEA) has been presented in several countries since 1992 as a tool for policy, planning and overall programme analysis. One of its main forms is the Sectoral Environmental Assessment which includes the evaluation of sector investment programmes involving multiple sub-projects; integration of environmental concerns into long-term development; and investment planning or the evaluation of sector policies (World Bank).

Mexican Environmental Law and Environmental Impact Assessment Regulations do not contemplate specifically SEA. However, certain strategies and programmes such as urban development plans or ecological ordinances of the country's territory should prepare a Regional Environmental Impact Statement of the works and activities considered in the plan or programme as a whole. It includes the types of works regularly submitted to the Federal Environmental Impact Assessment Proceedings.

In spite of the lack of specific regulations related to SEA, some of these assessments have been done in Mexico due to requirements established by international banks, which finance projects of different economic sectors in the country.

The main purpose of this paper is to present the experiences, results and conclusions obtained by using a methodology designed to assess the impacts of irrigation projects at a national level. Mexican Environmental Law and Regulations, internal organization of environmental authorities, as well as some external requirements from

international financial agencies are briefly analyzed as part of the methodology.

Key words: *strategic environmental assessment, sectoral environmental assessment, methodology, irrigation projects*

PUBLIC PARTICIPATION FOR RESTORATION OF THE SANBANZE TIDAL FLAT - OUTCOME OF THE BIGGEST ROUNDTABLE IN JAPAN

Kurasaka, Hidefumi
Chiba University
1-33 Yayoi-cho Inage-ku
Chiba City, Chiba 263-8522 Japan
+81 43 290 2585 Fax: +81 43 290 3585
kurasaka@hh.iij4u.or.jp

Sanbanze tidal flat is located in the inner part of the Tokyo bay, next to the Tokyo Disney Land. Despite its location in the center of the megalopolitan area, Sanbanze is important habitat for waterfowl, fish and shellfish, and is recognized as a candidate of the designated area of the Ramsar convention by the Ministry of the Environment Japan. Although a reclamation plan of this area was cancelled in 2001, a number of problems have yet to be resolved. The seashore is surrounded by artificial vertical seawalls, and people can hardly access the tidal flat, except for a very limited area. The tide and current had been changed by the reclamation of the surrounding area, and the total catch of fish has decreased. In January 2002, Ms. Akiko Domoto, the governor of the Chiba prefecture, started the Sanbanze Roundtable. The author is one of the 24 members of the roundtable. The task of the Roundtable was to prepare the plan for restoration and conservation of Sanbanze. Including sub-committees and working groups, meetings related to the Roundtable were held more than 160 times in 2 years. All the meetings were completely open to public. The Roundtable submits the Sanbanze Restoration Plan in January 2004. This paper describes how the Roundtable operated and points out various lessons.

Key words: *public participation, roundtable, tidal flat, Ramsar convention*

REMOTE INDIGENOUS HOUSING IN AUSTRALIA - A SOCIAL ASSESSMENT

Jardine-Orr, Andrea
Murdoch University
28 Lynton Street Doubleview
Perth, Western Australia 6018 Australia
+61 08 9242 8515
andrea@jardineorr.net

Social Assessment, although better known in the area of natural resource management, provides a methodology that has wide application. Its balance between primary and secondary information and the emphasis on key issues enables focused problem-orientated research. This is illustrated through discussion of a policy research project into remote indigenous housing in Western Australia and the Northern Territory areas of Australia. The provision of adequate remote indigenous housing has long been a contentious issue in Australia. Attempts to meet this need have led to the development of a wide range of housing and housing-related programs in remote indigenous communities. These programs tended to remove involvement in housing from communities to external program and project managers. The current challenge is to find ways to integrate the plethora of programs while promoting the concept of indigenous governance. The complexity of the institutional environment addressed by this research project led to the development of an additional social assessment tool. This tool, called institutional mapping by the multidisciplinary research team, provided a mechanism to both understand the different programs as well as a starting point for program-integration workshops and interviews. This paper discusses the research project, the social assessment methodology used as well as the institutional mapping tool developed as a result of the institutionally complex project environment.

Key words: *social assessment, housing*

STRATEGIC ENVIRONMENTAL ASSESSMENT AND STATE ECOLOGICAL EXPERTISE: COMBINING INCOMPATIBLE?

Bektashi, Leyli
University of Manchester
Oxford Road, Manchester, Lancashire M13 9PL UK
+44 161 323 0757
bektashi@inbox.ru

Jones, Carys
School of Planning & Landscape
University of Manchester
Oxford Road, Manchester, Lancashire M13 9PL UK
Fax: +44 161 275 6893
carys.jones@man.ac.uk

Unlike western states, the former USSR republics still apply the old Soviet procedure, State Ecological Expertise (SEE), to literally all developments, at both project and strategic-levels. More and more practitioners in these countries acknowledge nowadays that SEE alone is marginally capable of coping with the increasing pressures on the environment. Some of these countries have already adopted EIA as the basic environmental assessment procedure, but the adoption of Strategic Environmental Assessment (SEA) is considerably more difficult to introduce in these countries due to the more than 70 year-old traditions of central planning and secrecy. However, the experience of the Moscow City Master Plan to Year 2020 (MCMP) developed in 1997-1999 showed that there are, in fact, ways to successfully 'inject' at least some basic SEA principles into the SEE procedure. It was the initiative of the developers of the Plan to obtain public comments on the MCMP documentation and to further take them into account, thus establishing a precedent in the history of Moscow city planning. Besides, the MCMP considered alternatives to various sections of the Plan and

took into account environmental, social, health and sustainability considerations. Despite all drawbacks, the Plan's developers demonstrated how SEE can be possibly improved and brought into conformity with international SEA requirements through intermediate stages rather than through revolutionary reforms of the existing system. The appropriateness of such approach was confirmed when several regional authorities expressed willingness to take on-board the experience of the MCMP developers. Taking into account the fact that SEE is currently the only way to check environmental soundness of strategic-level developments in more than 10 countries, this experience could provide various participants of this procedure across the region with vital information, especially if supported by further evidence of the success of this new approach.

Key words: *SEA, Russia, Moscow City Master Plan, state ecological expertise*

SEA IN LAND USE PLANNING—COMPARING APPLICATION IN CANADA AND TRINIDAD

McKinnon, Don
Dillon Consulting Ltd.
235 Yorkland Blvd., Toronto, ON Canada
+1 416 229 4647 Fax: +1 416 229 -692
dpmckinnon@dillon.ca

The use of Strategic Environmental Assessment (SEA) has been formalized at the federal level in Canada through a Cabinet Directive requiring the conduct of an SEA for certain policy/program/plan proposals. The use of SEA at a provincial or municipal level has largely not been formalized. Nevertheless, there has been some use of the SEA framework for the formation of municipal land-use development plans. The application of SEA in these cases has been voluntarily applied and has not been as a result of legislation. These land use development plans, otherwise known as municipal 'official' plans, specify policies to guide long-term development. Although the 'official plans' are formed under planning legislation that is distinct from other EA legislation, the SEA approach has been used as a basis to review and assess alternative land development policies. To set the context for the paper, the land development process in the Province of Ontario will first be reviewed followed by an examination of the role and value of SEA as a framework to guide the formation of land development plans. This paper will then examine and compare case studies in Ontario where SEA has been used as a framework to guide the development of municipal official plans. Issues to be examined include: why SEA was selected as an appropriate framework; the value SEA provided to the process; contrasting the SEA approach to a more typical approach to plan formation; and describe the challenges encountered. The Canadian experience of SEA application will then be compared to experience in Trinidad where SEA is being considered as a tool to help guide land development in undeveloped areas and in areas subject to competing and conflicting land uses. Specifically, the challenges of applying SEA for guiding development planning in a developing country will be explored.

Key words: *SEA, land use planning, developing country*

COMMUNITY BENEFITS FROM OFFSHORE PETROLEUM ACTIVITY

Shrimpton, Mark
Jacques Whitford Group
607 Torbay Road, St. John's, NL A1A 4Y6 Canada
+1 709 576 1458 Fax: +1 709 576 2126
mshrimpt@jacqueswhitford.com
www.jacqueswhitford.com

Storey, Keith
Department of Geography
Memorial University of Newfoundland
St. John's, NL A1B 3X9 Canada
+1 709 737 8987 Fax: +1 709 737 3119
kstorey@mun.ca • www.mun.ca/geog/

Coastal communities faced with offshore petroleum activity commonly see it as threatening their economic and social well-being. As a consequence, such communities are often largely reactive, trying to stop the activity or limit its negative effects, while at the same time hoping to achieve some share of any economic benefits. Even in regions that are generally 'pro-development,' the maximization of local benefits is often ignored or treated less diligently than the mitigation and prevention of adverse environmental, social and economic impacts.

This paper explores these responses and argues for more proactive and strategic approaches. It first outlines common community responses to offshore petroleum activity. It then provides jurisdictional and sectoral case studies, from Newfoundland and tourism, to show how such activity can deliver sustainable social and economic development. Lastly, it describes the types of approaches and tools required in order to achieve this. These are based primarily on cooperation and collaboration between the local community, their governments and the petroleum industry, and recognize and seek to optimize the wide range of social, economic and environmental effects of the industry. They include social impact assessments, socio-economic environmental protection plans, impact and benefit agreements, and benefit plans.

Key words: *socio-economic, community, benefits*

INDUSTRIAL MEGA-PROJECTS: CONFRONTING COMMUNITY EXPECTATIONS

Shrimpton, Mark
Jacques Whitford Group
607 Torbay Road, St. John's, NL A1A 4Y6 Canada
+1 709 576 1458 Fax: +1 709 576 2126
mshrimpt@jacqueswhitford.com

www.jacqueswhitford.com

Storey, Keith
Department of Geography
Memorial University of Newfoundland
St. John's, NL A1B 3X9 Canada
+1 709 737 8987 Fax: +1 709 737 3119
kstorey@mun.ca • www.mun.ca/geog/

Prospective large-scale industrial activity is commonly initially seen as threatening community well-being. It is expected to cause boom and bust, inflation, social disruption, and damage to traditional industries and the environment, while benefiting few local people and companies. It is also thought that the benefits will be of limited duration and that the activity will leave a negative socio-economic and biophysical legacy. Such expectations result from the image of industrial activity, the emphasis environmental assessment processes place on negative impacts, and the fact that recent community economic development theory and practice largely reject such activity, preferring small-scale and community-based approaches. As a consequence, companies seeking to develop new projects are often confronted by communities and governments that are largely reactive, trying to stop activity or limit its anticipated negative effects, while hoping to receive some benefits. This can cause industry to experience project delays and increased costs, and local communities may see potential benefits delayed or foregone. Based on first-hand experience with mega-projects in Canada, the United States, Iceland and Australia, this paper explores the opportunities for more proactive and strategic approaches. It first describes initial community responses, based largely on the authors' recent experience in British Columbia; its offshore has been under petroleum activity moratoria since 1959, and government interest in lifting them has generated strong objections by environmental, First Nations and other groups. It then discusses the ways in which the effects of such activity can be optimized through cooperation and collaboration between the industry and local stakeholders, using approaches that recognize and seek to optimize the wide range of positive and negative effects of such activity. This includes contributing to sustainable economic and social development. Selected optimization tools, and the broader requirements for success, are discussed.

Key words: *mega-projects, effects management, industrial benefits, sustainable development*

THE USE OF PRINCIPLES, CRITERIA AND INDICATORS IN RELATION TO STRATEGIC ENVIRONMENTAL ASSESSMENT OF LAND-USE PLANS

Belcakova, Ingrid
Faculty of Architecture
Slovak Technical University
Nam.Slobody 19, 812 45 Bratislava, Slovak Republic
+421 2 57276283 Fax: +421 2 44458907
belcakova@fa.stuba.sk • www.fa.stuba.sk

The need for an early application of SEA in land-use planning is inevitable. The late acceptance of SEA in the planning process often means a limitation to find a possible fundamental alternative solutions to the problem (e.g., the project will not be licensed, or it will be without the substantial policy alternatives).

On regional and local level plans and settlement dimensions a lot of decisions are taken. These decisions are legally binding for plans on hierarchically lower levels. We should have in mind that, in many countries, sectoral plans have only directive effect for the location of different activities in space. Their realisation is dependent on the decision under land-use planning process.

The evaluation of spatial and cumulative effects is expected from SEA and mainly from SEA in land - use planning process, the one which represents inter-sectoral planning.

No matter what methods are applied, the social system of values and targets is always the main decisive normative basis. Without this, it is not possible to transform the description and quantification of environmental potentials and factors into their evaluation.

Environmental quality evaluation criteria, being the basis of environmental potential determination, are also a basis of environmental assessment of a project, programme, plan or policy. So it is an assessment of how the realisation of a certain intention can influence the current (actual) potential of the affected area not only in ad hoc but in a trajectory of its predicted spatial development.

The paper is then focused on the use of environmental, social and economic principles, criteria and indicators in the based on the case-study of SEA of Bratislava City land - use plan.

Key words: *SEA, land-use planning, environmental quality, cumulative effects, environmental principles, criteria and indicators*

THE STATE OF CURRENT PRACTICE OF ENVIRONMENTAL IMPACT STUDIES: THE CASE OF SMALL SCALE HYDROPOWER PROJECTS

Pinho, Paulo
Faculty of Engineering
University of Oporto
Rua Dr. Roberto Frias, Oporto 4200-465 Portugal
+351225081903 Fax: +351225081486
pcpinho@fe.up.pt • www.fe.up.pt

Maia, Rodrigo
Faculty of Engineering
University of Oporto
+351225081916 Fax: +351225081486
rmaia@fe.up.pt

Monterroso, Ana
Faculty of Engineering
University of Oporto
+351225081455 Fax: +351225081486
anamonterroso@yahoo.com

Environmental authorities can abort an EIA process of an Annex I or Annex II project, by refusing the respective EIA Report, on the grounds of technical or methodological insufficiencies, previously identified. However, it cannot be taken for granted that, once an EIA Report is formally accepted, as part of an EIA process, its quality standard is, consistently, of a satisfactory level. This paper summarises the results of a one-year research project aimed at assessing the quality of EIA studies carried out for a specific type of Annex II projects. A number of reasons made us select small scale hydropower dams for this research. An extensive survey was carried out to analyse all EIA Reports that were the basis of successful EIA processes involving this kind of small scale projects, under the old and the new legislation, that is, over the last two decades. Often times unnoticeable to the general public and the media, located in isolated areas upstream secondary rivers, these projects are likely to generate some significant environmental impacts, in particular on the aesthetic value and character of local landscapes and on pristine ecological habitats. And yet, they are usually regarded as environmental friendly projects designed to produce emission free energy. The design of the evaluation criteria benefited from the literature review on similar research projects carried out in other EU countries. The evaluation exercise revealed a number of technical and methodological weaknesses in a significant percentage of cases. A set of simple and clear cut recommendations is proposed twofold: to improve the current standard of EIA practice and to strengthen the role of the EIA Commissions, at the crucial review stage of the EIA process.

Key words: *quality of EIA reports, small hydropower projects*

USING PUBLIC PARTICIPATION DURING AN EIA TO GUIDE INDUSTRY TO SUSTAINABLE DEVELOPMENT

Greyling, Tisha
Golder Associates Africa
P.O. Box 95823
Waterkloof 0145 Pretoria, South Africa
+27 12 361 008 Fax: +27 12 361 0083
tgreyling@golder.co.za • www.golder.co.za

Our EIAs should provide decision-makers, i.e., the developer and the regulating authorities, with sufficient information to decide whether a project will contribute to sustainable development or not.

This paper sets out a single measure of contribution by industry to sustainable development, based on the aggregate increases in people's quality of life. If the contribution of industry can be measured within its zone of influence and be shown to be positive and indefinitely enduring, then it can be said that the industry has contributed to sustainable development.

How do we measure quality of life? Maslow based his Hierarchy of Needs on people being motivated by their unfulfilled needs. Therefore, we can take the issues and concerns that people contribute during public participation for an EIA to be motivated by their unfulfilled needs, or by threats to those of their needs they have already fulfilled.

People from a range of different sectors of society contribute issues during an EIA. Their issues usually reflect needs or threats in all three dimensions of sustainable development: ecological integrity, social equity and economic growth. Categorising these issues in terms of the Needs Hierarchy gives us an indication not only of the threats to the fulfilled needs of people within the industry's zone of influence, but also of their unfulfilled needs.

This means public participation during the EIA should be a constructive process that includes some visioning for the future in which the industry proponent, stakeholders and the regulatory authorities all participate. The process could indeed be viewed as the first step towards an enduring "pact" between industry and its stakeholders.

It further means that the EIA specialists should in addition to the mitigation of negative impacts assess the degree to which the industry can assist to fulfil people's unmet needs, based on the issues raised, in each of the three dimensions of sustainable development.

The challenge for both the EIA public participation practitioners and specialists is to shift the paradigm away from focusing on mitigation of negative impacts to focusing on the enhancement of positive impacts, without creating undue expectations or turning the industry into a surrogate government.

Key words: *public participation, sustainable development, EIA, quality of life*

INTEGRATING INEQUALITIES IN HEALTH INTO EIA (ENVIRONMENTAL IMPACT ASSESSMENT)

Cave, Ben
Ben Cave Associates
PO Box 220, Brighton, East Sussex BN2 3WJ UK
+44 7786 930 391 Fax: +44 1273 327766
ben.cave@totalise.co.uk

Vohra, Salim
Living Knowledge
Flat 2, 24 King's Avenue Hounslow
Middlesex TW3 4BL UK
+44 20 8572 3608 Fax: +4 20 8572 8016
salim

Local residents often feel shortchanged by statutory appraisal processes. The views and agenda of the external experts are often different from resident experts. This presentation will look at how issues of health change and health inequality

were addressed in an integrated environmental impact assessment (EIA) and health impact assessment (HIA). The EIA/HIA was carried out on two options for development and a do-nothing option. The development site is located in a densely populated urban environment in London. The population has high levels of need: there is a core of long-term residents with strong ties to the area. There are also a large numbers of people who have come to the area more recently. The site is bordered by transport infrastructure, private and public services and housing. At the time of the appraisal the development site was open space which had some all weather play areas. We will describe how we used structured observations to ascertain how the site is used as a social and health resource. Who uses the site at the moment? What do they do? When do they use it? How will they be affected by the proposals for change? We will describe how we worked with the residents' group and other networks to identify other issues connected with the development. Who doesn't use the site? Who would like to use it? The consultation continually picked up on issues which fall outside the remit of an EIA as specified under statutory legislation. We will describe how these issues were addressed and fed back into the wider report. This ensured that the appraisal was informed by an understanding of health, and other social, inequalities and the lived experience of people living adjacent to the site.

Key words: *HIA, environmental impact assessment, participation, social impact assessment*

IMPLEMENTING THE EUROPEAN SEA DIRECTIVE IN PLANNING: TODAY'S PRACTICE AND TOMORROWS INTEGRATION

Kørnøv, Lone
Aalborg University
Department of Development and Planning
Fibigerstraede 13, 9220 Aalborg Denmark
lonek@plan.auc.dk

The Danish planning system today already takes environmental considerations into account while developing and implementing regional and municipal plans. The focus of this paper is to clarify as to how SEA accordance with the European Directive on environmental assessment of plans and programmes can complement the existing planning practice. The paper contains three parts.

Firstly, based on a questionnaire to 61 municipalities and a detailed co-operation with 3 municipalities the paper shows how the Danish municipalities today plan with regard to: a) the process itself, b) the methods used for public participation and environmental considerations and c) the internal organisation of the planning process.

Secondly, the paper presents the results from a workshop held with presentations from consultancies and municipalities. The workshop was used as an opportunity to try different ideas and alternatives on: a) the future working division between planning, SEA and Agenda 21 and b) how to integrate SEA in the process of formulating and implementing municipal plans. The second issue focused on the questions: When environmental assessment should occur in the planning process, how to do the assessment and who should make it?

Thirdly, the result from the questionnaire, the co-operation and the workshop are used in the paper to draw up and discusses different alternatives for how to make tomorrows integration work—covering procedural, methodological and organisational aspects.

Key words: *European SEA Directive, SEA, planning*

HIA IN THE ORANGE PLANTATIONS AND ITS CONTRIBUTION TO HEALTHY PUBLIC POLICY IN THE AGRICULTURAL SECTOR IN THAILAND

Boonrahong, Chomchuan
Institute of Sustainable Agriculture Community
Chaing Mai, Thailand
boonrahong@hotmail.com

Setthasiroj, Bantoon
Health Systems Research Institute
Nonthaburi, Thailand
kittiam@mozart.inet.co.th

Sabrum, Nuntana
Health Systems Research Institute
Nonthaburi, Thailandnuntana@hsri.or.th

Pesticide use in the orange plantations in the Fang Watershed area is an on-going controversial issue in Thai society. Since 1995, oranges have become a new popular crop, as its price was higher than the other main crops. Consequently, the orange-growing areas have rapidly expanded. At present, it is estimated that the orange plantation areas in the Fang Watershed are more than 16,000 ha.

The Fang Watershed area is one of the most important natural forest areas in Northern Thailand. Therefore, the plantations that have been using vast amount of pesticides, has caused many problems to local communities e.g., bad odours, polluted water, deforestation, and illegal migration of foreign labor. The local communities tried many times to complain with the local authorities. But their voices were vanishing.

By the end of 2002, the HIA study had been initiated by a local NGO. The project is a truly participatory research as the local villagers, who have been affected from the plantations, are the majority of the research team. The study aims to provide the evidence-based information to support their learning process in health impacts surveillance. It is found that there are two significant impacts; namely physical health e.g., skin rash, dizzy, difficulty breathing, and social impacts such as community conflicts, quarrel and collapse of communities' relationship.

Along the study process, the health impacts have been communicated with the public through various mass media. In September 2003, the Ministry of Natural Resources and Environment has been mandated by the Prime Minister to solve the problems of the orange plantations and a number of ad hoc committees have been appointed. The results and consequences of the working process as well as the public policy process are still to be followed.

Key words: *health impact assessment, pesticide, public policy*

TOWARDS INTEGRATED IMPACT ASSESSMENT

Cave, Ben
Ben Cave Associates
PO Box 220, Brighton
East Sussex BN2 3WJ UK
+44 7786 930 391 Fax: +44 1273 327 766 (Fax)
ben.cave@totalise.co.uk • www.seahorseia.com

Vohra, Salim
Living Knowledge
Flat 24, 24 King's Avenue
Hounslow, Middlesex TW3 4BL Great Britain
+44 20 8572 3608 Fax: +44 20 8572 8016
salimvohra@livingknowledgeconsulting.com
www.seahorseia.com

Nicholson, Sean
Entec UK
Gables House Kenilworth Road
Leamington Spa, Warwickshire CV32 6JX UK
+44 1926 439 038 Fax: + 44 1926 439010
nichs@entecuk.co.uk • www.entecuk.com

Tools for appraising plans and programmes are developing at a rapid rate. In the UK Strategic Environmental Assessment and Sustainability Appraisal are barely bedded in yet practitioners are already looking beyond these tools. This presentation describes work to develop an integrated appraisal tool on behalf of the London Health Commission. The tool will be initially applied to Sub-Regional Development Frameworks for London. EC Directive 2001/42/EC will require an environmental assessment of certain plans and programmes. The Directive must be enacted by July 2004. It will apply to a range of plans and programmes, including land use and spatial plans. Integrating different tools is challenging. In the case of plans and programmes that fall under the SEA Directive, the ultimate aim of this work would be an approach which is fully compliant with the Directive but which is enriched with the essence of other tools. A balance needs to be struck to incorporate other tools in a meaningful way without producing something that is unwieldy. Different tools bring different approaches to the assessment of effects. Can these perspectives be combined? In the UK there are appraisal tools which integrate different approaches but they lack many of the steps required by the SEA Directive. Perhaps equally as important as using an integrated appraisal tool is the use of an integrated team to use it. Resourcing could therefore provide a challenge. Integrated impact assessment is an ideal. Caution is needed in how the term is used. A genuinely integrated tool provides the opportunity to appraise plans and programmes against a range of economic, social and environmental considerations. Currently in Europe we suggest that a central attribute of an integrated approach is that it enables compliance with the requirements of the SEA Directive.

Key words: *SEA, HIA, integrated appraisal*

COMMUNITY-BASED REMEDIATION OF ENVIRONMENTAL LIABILITIES IN BOLIVIAN SMALL-SCALE MINES

Monosowski, Elizabeth
The World Bank
1818H Street, NW, Washington, D.C. 20433 USA
emonosowski@worldbank.org

Sánchez, Luis Enrique
Escola Politécnica, University of São Paulo
Av. Prof. Mello Moraes, 2373
05508-900 São Paulo BRAZIL
lsanchez@usp.br

Thomas
Fundación Medmin, Bolivia

Fernández, Juan Torrez
Sergeomin, Bolivia

This paper discusses the process and the results of four small-scale initiatives to remediate environmental liabilities arisen from past and present mining activities in Bolivia. Tailings disposal and acidic waters draining directly to rivers resulted in extensive environmental damage and related social impacts. Reduced crop productivity due to irrigation with contaminated water and inadequacy of water for cattle consumption are among the factors that led to vigorous protests staged by peasants living near the mines. An international cooperation project was an opportunity to implement demonstrative remediation projects and to evaluate results. Measures included: (1) constructing a tailings dam to store tailings from forty small polymetallic ore treatment plants; (2) constructing three liming plants to raise water pH and promote metal precipitation; and (3) constructing wetlands seeded with the local reed totora to retain metals. Besides pressing for a solution, the community has been involved in planning, construction and operation of facilities. Different partnerships have been established among local communities, private/cooperative sector, and government agencies both at local and national levels. Significant benefits resulted from investments reaching US$ 450,000: about 900 hectares of land have again been suitable for irrigation, benefiting some 20,000 families. Direct and indirect social benefits include raising income for beneficiary communities, agricultural products feature better quality, jobs and income have been created during construction, local

workers have been trained in construction techniques, resolution of environmental conflicts opposing miners and communities, partial mitigation of environmental impacts in the upper Pilcomayo basin, a source of transfrontier pollution.

Key words: *small-scale mining, acid mine drainage, community involvement, environmental remediation, Bolivia*

POLICY INQUIRY THROUGH IMPACT ASSESSMENT: INSIGHTS FROM POLICY ANALYSIS

Wallington, Tabitha Jean
School of Environmental Science
Murdoch University
South Street, Murdoch WA 6150 Australia
+61 8 9360 2701
T.Wallington@murdoch.edu.au

This paper will explore the insights of policy analysis for EA. The core argument will be that EA should be conceived as a democratic process of policy inquiry. Several fields of policy research will be explored, including the "argumentative turn" in policy analysis, and recent moves to recall the theoretical roots of policy analysis in Laswell's "policy sciences of democracy." Based on this work, the paper will suggest that EA is better thought of as an interactive social process of communication, rather than as a technical input to "the decision." Interestingly, this approach recalls Caldwell's aspirations for EA as a process that aims to inform policy making with foresight, wise judgment, and precautionary action - qualities which are more evaluative than analytical. Case studies of science-based environmental assessments will be drawn upon to illustrate the communicative nature of EA. These studies will also suggest the need for EA to be an interactive, dynamic and ongoing process if the realities of multiple participants, contestable information, and the capriciousness of policy making are to be constructively addressed.

Key words: *policy environmental assessment, strategic environmental assessment, policy analysis, communication, policy theory*

ANALYSIS OF THE FOLLOW-UP STUDIES OF MAJOR REGIONAL TRANSPORTATION PROJECTS

Petajajarvi, Reima
Finnish Road Enterprise
Opastinsilta 12 B P.O. Box 157
Helsinki, Uusimaa 00521 Finland
+358 (0)20 444 2175 Fax: +358 (0)20 444 2154
reima.petajajarvi@tieliikelaitos.fi

The study concentrates on Finnish transportation projects. Besides having outstanding role in regional transportation network, they also represent projects carried out in areas of significant environmental values. Motorway between towns Kemi and Tornio in northern Finland was completed in 2001. The EIA was carried out in 1995-1996. Ground water risks (one Natura 2000 Conservation Programme area), impacts on threatened plants and on landscape as well as cultural heritage were identified as significant effects of the project. The follow-up studies carried out after the EIA focus on noise and ground water issues. The bridge from mainland to Raippaluoto Island in western Finland was completed in 1997. The EIA was initiated in 1993, but was suspended and never actually completed. However, the follow-up studies were started already before the bridge was completed. The main issues in the studies are impacts on natural environment as well as social and socio-economic impacts of the bridge. The EIA of the fixed link between mainland and Hailuoto Island was carried out in 1992-1993, but the project itself is still pending. The project has resurfaced again due to the Regional Master Plan, which is expected to be ratified soon by the Ministry of Environment. Hailuoto Island is probably the most valuable and protected island in Finland. Thus, it is no wonder that the project is very controversial in the region. The study in hand analyses the three EIAs and follow-up studies, compares the assessed impacts to the actually detected changes and, in terms of the case Hailuoto, seeks new approaches to possible further assessments and follow-up studies. The study also raises questions on the roles of different authorities in follow-up as well as brings in speculations whether the recent follow-up studies really concern all the relevant issues.

Key words: *follow-up, transport infrastructure*

EXPERIENCES FROM NORWEGIAN AND NORDIC CASE STUDIES ON SEA

Lerstang, Tor
Institute of Transport Economics (TÖI)
Grensesvingen 7 P.O. Box 6110 Etterstad
Oslo 0602 Norway
+4722573876 Fax: +4722570290
tle@toi.no • www.toi.no

Tesli, Arne
Norw Institute for Urban and Regional Research (NIBR)
Gaustadallén 21 P.O. Box 44 BLINDERN
Oslo 0313 Norway
+4722958800 Fax: +4722607774
arne.tesli@nibr.no • www.nibr.no

The paper will summarise the findings of Norwegian and Nordic case studies on strategic environmental assessment, and will focus on some methodological challenges for carrying out SEA. What are the obstacles that have been observed relative to SEA becoming an efficient environmental policy instrument, and what efforts and measures are necessary in order to achieve its full potential? Some of the issues that will be discussed:

- What are the formal requirements for SEA, and what kind of framework and guidelines has been developed for carrying out SEA?
- How is the SEA-process documented in reports, etc.?

- To what extent is public participation ensured in the SEA process? - Does the system rely upon transparency, openness and public participation in the decision-making and in the monitoring of the development process?
- What are the challenges that can be seen relative to the requirements of the EU Directive on environmental assessment of certain plans and programs? The paper will also discuss the role and position of Environmental Impact Assessment and Strategic Environmental Assessments relative to the objective of achieving sustainable development. We will discuss the relative importance and positioning of EIA and SEA, and the environmental management and planning system in general: How does it relate to; how is it influenced by; and how does it influence other, high-level, policy making and overarching decision making in society? That is; where is the SEA taking place? How important is it for the overarching decision making and policy formulation?

Key words: *SEA, planning, policy making, sustainable development, EIA*

DOES HIA HAVE AN IMPACT ON DECISION-MAKING PROCESSES? METHODOLOGICAL ISSUES AND PRELIMINARY RESULTS FROM A 14-COUNTRY STUDY

Nilunger, Louise
European Centre for Health Policy/WHO Regional Office for Europe
Cité Administrative de l'Etat
Quartier Esplanade Montagne de l'Oratoire 20, boîte 3
Brussels, Bruxelles 1010 Belgium
+32 2 210 5004 Fax: +32 210 5037
Louise.Nilunger@health.fgov.be

Wismar, Matthias
European Centre for Health Policy/WHO Regional Office for Europe
+32 2 210 4983 Fax: +32 2 210 5037
Matthias.Wismar@health.fgov.be

Many countries in Europe are developing HIA at a national, regional or local level. However, there is a growing concern about HIA in regard to its effectiveness: Does it really make a difference? To what extent does HIA influence policy decision-making? What are the factors that explain success and failure of the implementation of HIA? In order to produce this evidence the ECHP WHO Regional Office for Europe/European Observatory on Health Care Systems has started a project on "The effectiveness of HIA." The study is co-funded by the European Commission. The study includes 15 partners from 14 countries and a European NGO. To assess the effective implementation a set of indicators has Output: a) do the decision makers consider recommendations from(been designed. assessment; b) do the decision makers give reasons for not adopting a recommendation from assessment; c) do the decision makers alter proposals due to (assessment; d) is the decision derived from the assessment implemented. Structure: a) community/health stakeholder involvement; b) scope of resource input (financial, human, time); c) staff competence to initiate assessment, d) the number and the background of staff available to carry out the assessment; d) the degree of formal obligation to carry out HIA (legal basis, administrative (routine, opportunistic); e) any existence of a reference or steering group. Process: a) how best the available evidence is collated; b) community/stakeholder involvement by frequency and role (excluded, observing, public hearing, advising, joint decision making); c) any activities and Feedback: a) are mechanisms for(interventions of reference or steering group evaluation in place; b) is evaluation carried out for all HIA related decisions; c) are the results from the assessment feeding into the decision making process. Preliminary results of the application of these indicators will be presented.

Key words: *health impact assessment, Europe, decision-making process, implementation, effectiveness*

MAPPING THE USE AND CONTEXT OF HEALTH IMPACT ASSESSMENT ACROSS EUROPE: METHODOLOGICAL ISSUES AND PRELIMINARY RESULTS FROM A 14-COUNTRY STUDY

Wismar, Matthias
European Centre for Health Policy/WHO Regional Office for Europe
Cité Administrative de l'Etat
Quartier Esplanade Montagne de l'Oratoire 20, boîte 3
Brussels, Bruxelles 1010 Belgium
+32 2 210 4983 Fax: +32 2 210 5037
Matthias.Wismar@health.fgov.be

Nilunger, Louise
European Centre for Health Policy/WHO Regional Office for Europe
+32 2 210 5004 Fax : +32 2 210 5037
Louise.Nilunger@health.fgov.be

A Previous European mapping exercise (Welsh Assembly Government, EuroHealthNet 2003) has produced anecdotal evidence that health is taken into account not only in HIA, EIA or IIA but also in other activities, such as a) intersectoral structures, b) audits of public administration, c) inter-ministerial working groups, d) through land use planning, e) budget and planning process of governments and ministerial departments, f) national and international environmental requirements, g) government memoranda, h) staff appraisal and review systems. What sort of HIA is employed in these countries? What different methodologies and processes take health into account? How well is health included in the various activities? On what level (national, regional, local) do these activities take place? What policies are being assessed? What sectors are addressed? Who is in charge of it and what is the legal basis for these activities? What are the differences in HIA-profiles of countries? Why are some countries more

active than others? Why do some countries use other methodologies to take health into account than others? In order to produce the evidence and answers to these questions, the ECHP WHO Regional Office for Europe/European Observatory on Health Care Systems and Policies has started a project on "The effectiveness of HIA." The study is co-funded by the European Commission. The study includes 15 partners from 14 countries and a European NGO. A policy analysis and an organizational analysis will be carried out. These analysis are based on a number of methodologies employed in the study which will facilitate the mapping of the use of HIA and its context: a) literature review, b) interviews with key informants, c) review by expert panel. The presentation addresses methodological issues and preliminary results from the mapping exercise.

Key words: *health impact assessment, Europe, mapping, context*

STRATEGIC AND REGIONAL ENVIRONMENTAL IMPACT ASSESSMENT FOR NORWEGIAN PETROLEUM DEVELOPMENT PROJECTS OFFSHORE

Kinn, Sigurd Juel
Statoil ASA
Forusbeen 50, N-4035 Stavanger, Norway
+47 909 34126 Fax: +47 51 99 00 50
sjk@statoil.com

Since 1997, Regional Environmental Impact Assessment (REIA) has been implemented as a tool for improving the quality and efficiency making of the EIAs of the petroleum activity of the Norwegian Continental Shelf (NSC). The experience so far is that these objectives are met. The REIA is covering all relevant environmental impacts and to a certain extent socio-economic impacts for all existing, planned and foreseen projects within the region. NCS is divided into three regions, the North Sea, the Norwegian Sea and the Barents Sea. For the first two regions, REIAs have already been prepared and are currently being updated. For the Barents Sea, no REIA has been prepared because only one project has been approved so far (the Snow-white LNG-project). The Barents region is located within the Artic Region and the environment is regarded as sensitive by the authorities and NGO's. Because of that, the existing Norwegian Government decided to stop all petroleum related activity within the region, except the approved LNG-project, until a Strategic Environmental Assessment of the Barents Sea had been conducted. This assessment has been prepared and has been on a public review (autumn 2003), and the Government has opened a part of the region for limited activity. Parallel to this assessment, separate impact assessments of the fishery activity, the transportation activity and the rest-activity including background pollution are being prepared. Based on these assessments, the authorities will prepare a Total Management Plan for the region, which will consider the further development of petroleum activity. This SEA-process has so far been a controversial issue in Norway. Similar SEA-processes may be started for the other regions by the authorities. This might influence the REIA work already being conducted by the petroleum industry within the region.

Key words: *SEA, REIA, petroleum industry*

ENVIRONMENTAL MANAGEMENT PLANNING IN EIAS FOR NEW INDUSTRIAL ESTATE PROJECTS IN ENGLAND

Slinn, Paul
Research Associate
EIA Centre
University of Manchester
Oxford Road, Manchester M14 9PL UK
+44 (0)161 275 6881 Fax: +44 (0)161 275 6893
paul.a.slinn@man.ac.uk

Environmental impact assessment (EIA) and environmental management are two key tools for identifying and controlling the affect of actions on the environment. There is a strong case for advocating a formal and practical linkage between the two across the point of decision at which the planning of an action becomes its implementation. This is particularly so because much of the work undertaken for EIA is directly relevant to subsequent environmental management strategies.

However, linking EIA and environmental management has proved problematic in the past due to the differing origins and purposes of the two tools and to the understandable pre-occupation with achieving acceptance and developing practice. Now, though, EIA is a maturing tool, environmental management systems such as ISO14001 are rapidly growing in popularity and business, government and the environmental industry are developing the awareness, experience and skills necessary to drive the development of practical links between EIA and environmental management.

This paper therefore investigates the degree to which recent EIAs address environmental management issues. To this end, a sample of recent environmental statements has been reviewed in respect to a key category of projects, industrial estates, in England. These developments are a key mode of large-scale commercial development and are highly planned and scrutinised, routinely subject to EIA and requiring a high degree of ongoing management control. The research examines the degree to which environmental management planning is reflected in the proposals contained in environmental statements, and proposes reasons that might contribute to the pattern of results found.

Key words: *environmental impact assessment, environmental management, industrial estates*

EIA CAPACITY BUILDING IN AFRICA—TRIALS, SUCCESSES AND ERRORS

Dalfelt, Arne
Norwegian Institute for Urban and Regional Research

Gaustadalleen 21, Blindern, Oslo, Norway
Postboks 44, Blindern, 0313 Oslo, Norway
+47 22958800/+47 22958984
Fax: +47 22607774
arne.dalfelt@nibr.no • www.nibr.no

The ad-hoc nature of most EIA training so far provided in Africa and its all too common isolation from country-owned institution-building means that many opportunities have been lost and individual initiatives have not been followed-up. It is therefore encouraging to see that the Marrakech Declaration focuses on a coordinated initiative.

EIA capacity building should primarily respond to country-level needs, since EA legislation, implementation procedures and development works are mostly defined by country boundaries. At the same time, countries are in different stages of advancement with respect to EIA legislation and implementation, as well as general development, and therefore have a varying demand for EIA work and EIA capacity. Sub-regional cooperation can increase the demand for EIA capacity and improve utilization of existing capacity.

Sub-regional co-operation can also significantly enhance certain aspects in capacity development, but can only build successfully on countries that have a working system in place. During recent years, a strong but unstable capacity building program was built on sub-regional basis in Africa. However, it has proven difficult to build EIA capacity in countries without depending too much on a few strong individuals, making new institutional structures unstable in the event that these individuals leave the scenes or become unfunded. However, positive exceptions have occurred showing promise of sustainability when donors have been willing to maintain institutional support for a minimum number of initiating years. There are lessons learnt that can prove valuable for the planned Marrakech Action Plan.

Key words: *capacity building strategies, action plans, lessons learned, strategic environmental assessment*

ENVIRONMENTAL IMPACT ASSESSMENT AND IMPACT BENEFIT AGREEMENTS: CREATIVE TENSION OR CONFLICT?

Donihee, John
Barrister and Solicitor
3516 Underhill Drive N.W., Calgary, AB T2N 4E8 Canada
+1 403 282 6003 Fax: +1 403 282 6596
donihee@telusplanet.net

Klein, Heidi
Gartner Lee Ltd.
840-7th Ave., Suite 1605, Calgary, AB T2P 3G2 Canada
+1 403 262 4299 ext. 122 Fax: +1 403 264 8412
hklein@gartnerlee.com

Stewart, Gordon
Gartner Lee Ltd.
P.O. Box 98, Yellowknife, NT X1A 2N1 Canada
gstewart@gartnerlee.com

In northern Canada, a new paradigm for large project approvals has emerged based on land claims mandated environmental impact assessment (EIA) processes and on the negotiation of impact benefit agreements (IBAs). Recent experience in the Northwest Territories (NWT), Yukon, and Nunavut indicates that negotiated IBAs have emerged as a necessary adjunct to the public EIA process in order to secure the public support necessary for government approvals.

Aboriginal land claims enshrine new institutions of public government with a mandate for EIA. These co-management boards have important EIA jurisdiction including consideration of the socio-economic and cultural effects. Land claims also include provisions that ensure that economic and other benefits accrue to the regions affected because of development. These benefits are negotiated bilaterally between project proponents and aboriginal groups whose lands will be affected.

The negotiation of private IBAs can and has affected the broad goals of EIA in the north. Good EIA processes encourage public involvement and openness in decision-making. The content of IBAs, as private agreements with aboriginal peoples, are not part of the evidence considered in an EIA, but they are part of the mitigation of socio-economic and cultural impacts of large developments. The result is potentially a problem for a board which wishes to encourage an efficient EIA process but which must base its decision on a public record compiled during an EIA proceeding.

This paper will explore and describe:

1. The new frameworks for EIA and IBA requirements in Nunavut, Yukon, and the NWT.
2. Recent experience for large development approvals.
3. The tension between public EIA processes and private IBAs when they are brought to bear on the same development.
4. An approach to reconciling the use of these tools that encourages both effective public decision-making and the mitigation of the socio-economic impacts.

Key words: *impact benefit agreements, public involvement, land claims, socio-economic mitigation measures*

MINNOWS GET THEIR FREE WAY: AN EXAMPLE OF HOW DEVELOPMENT NEEDS WERE BALANCED WITH THE NEEDS OF THE ENVIRONMENT TO PREVENT THE EXTINCTION OF THE ENDANGERED MINNOW

Bothma, Jenine
South African National Roads Agency Limited
P.O. Box 415, Pretoria 0001 South Africa
+2 (12) 426 6013 Fax: +7 (12) 362 2116
bothmaj@nra.co.za

One of the many challenges facing engineers is to plan, design, construct and operate a road in harmony with the environment. Engineers have been attempting to do this for many years and have seldom achieved the ideal. The N4 Maputo Development Corridor Toll Road project in South Africa is a prototype project and example of how development needs were balanced with the needs of the environment.

The N4 Maputo Development Corridor Toll Road passes over a river that is home to the rare and endangered minnow. The endangered fish, scientifically known as *the Kneria auriculata*, is on the red data list. The planning of the N4 raised the question: How to change the design of the bridges crossing the specific river on the N4 Maputo Development Corridor Toll Road to accommodate this endangered fish species while catering for the usual practical constraints? The answer lies in the design and construction of the fish ladder to save the minnow from extinction.

The presentation will provide background information on the project and information on the minnow itself. The presentation will also explain how civil engineering principles were applied to save the minnow from extinction in South Africa.

This project represents an achievement, a balanced integration of practical engineering requirements and conservation of the environment. The project is an example of how considerable effort was expended to protect the environment, without compromising public safety.

Key words: *development needs, balanced, environment, minnow, fish ladder, integration*

COLLABORATIVE APPROACHES AND STRATEGIES FOR OIL AND GAS IMPACT MANAGEMENT

Stubbs, Thomas
Headwater Group
1323 Hamilton Street NW, Calgary, AB T2N 3W8 Canada
+1 403 220 1144 Fax: +1 403 220 1149
tstubbs@telusplanet.net

A call to build on northern Canadian approaches towards Collaborative Approaches and Strategies for Oil and Gas Impact Management grew out of social and economic challenges facing the NWT as a result of expanded growth. Challenges include

- Establishing institutions that recognize the role of northern interests in decision making
- The rapidity of change, the pace and scale of non-renewable resource development
- Social and economic conditions that are far poorer than communities in the rest of Canada
- Limited capacity and a weakened social fabric to sustain the integrity and identity of the people and communities.

The life cycle of oil and gas development in northern Canada is moving beyond the exploration and initial field development phase as conceptual designs for major pipeline systems will serve as a catalyst for the entire region. The proposal for a Mackenzie Valley natural gas pipeline is in the conceptual design phase and will stimulate expansion of development activity throughout the region. Options for broad consideration to manage social and economic impacts caused by upstream oil and gas developments were developed. Information and research was made available so all parties can effectively participate in negotiations and decision-making with respect to developing petroleum resources and infrastructure. Extensive reviews of Canadian and international impact management practices as well as northern Canadian projects, agreements and practices. Key industry, government, community leaders and practitioners were consulted.

Key words: *social and economic impact management, negotiations, aboriginal, petroleum industry*

THE FIRST SOCIAL IMPACT ASSESSMENT OF A DEVELOPMENT PROJECT ON AINU CULTURE IN JAPAN

Iwasaki-Goodman, Masami
Hokkai Gakuen Unviersity
1-40, 4-chome, Asahi-machi, Toyohira-ku
Sapporo, Hokkaido 062-8605 Japan
+81 11 886 2762 Fax: +81 11 886 2762
iwasaki@jin.hokkai-s-u.ac.jp

Kaizawa, Koichi
Office for the Impact Assessment on Ainu Culture
31-3, Nibutani, Biratori, Saru-gun
Hokkaido 055-0101 Japan
+81 1457 4-6011 Fax: +81 1457 4-6012

In 1997, the Nibutani Dam court case concluded with a judgment from the Sapporo District Court that the Government of Japan had failed to give sufficient consideration to the impact that the construction and operation of the dam would have on the local Ainu culture. The judgment required the proponent to conduct an impact assessment prior to the construction of future development projects. Currently, the Government plans to construct another dam in the same region and has funded the local community of Biratori to conduct the required impact assessment. In April of 2003, the people of Biratori formed a research group and have been working to assess the possible impact of the second dam on the local Ainu culture. Social Impact Assessment is relatively new in Japan. This is the first such study to assess the impacts of a development project on Ainu culture. Furthermore, since this assessment focuses on the impact on Ainu culture, it requires a sensitive approach in order to engage the relatively few Ainu elders. For this reason, the local people decided to take up the responsibility of conducting the impact assessment themselves, with assistance from social scientists and other

experts. The research group has implemented a research design and are employing research methodologies adopted from impact assessments conducted overseas, modifying them to meet their local situation and needs. This paper reviews the over-all process of their effort to plan and conduct the impact assessment, with a focus on the research design and methodology being used to assess the impact of the proposed dam on the local Ainu culture.

Key words: *dam, Ainu, impact assessment, Japan*

TRANSPORTATION ISSUES IN IMPACT ASSESSMENT IN NUNAVUT, CANADA

Traynor, Janice
Indian and Northern Affairs Canada
PO Box 100, Iqaluit, NU X0A 0H0 Canada
+1 867 975 4554 Fax: +1 867 975 4585
traynorj@inac-ainc.gc.ca

Abernethy-Gillis, Robyn
Indian and Northern Affairs Canada
+1 867 975 4552 Fax: +1 867 975 4585
abernethy-gillisr@inac-ainc.gc.ca

Northern Canada is noted for its remoteness, marked by lack of ground transportation routes, as well as its significant mineral resource potential. Mining companies are vigorously exploring in Nunavut, where the ability to transport supplies represents a large economic and logistical challenge to projects. The most common forms of proposed transportation are by winter or all-weather road, barge or ship, or by air, with planes landing on ice in winter or year-round on airstrips built at project sites. Concern has been raised regarding the potential rapid growth of fragmented road, air, and shipping systems in Nunavut, to access mineral deposits.

In this setting, important factors in impact assessment (IA) of transportation components of development projects include appropriate scoping of the spatial extent of the transportation links, transboundary impacts, cumulative effects assessment, and alternatives assessment of transportation methods. Scoping transportation components and use of those routes, is challenging, as the spatial extent or links to existing routes with comparable uses are not always obvious, particularly where new routes are being established. Transboundary issues arise as routes cross into neighbouring jurisdictions with different IA regimes or impact transboundary wildlife resources.

Alternative means to ground transportation need to be examined in the context of alternative energy sources. At present, most proponents rely heavily on ground transportation to make the transportation of large volumes of fuel required for diesel energy generation in remote sites economical. A further challenge is to recognize and assess the potential of cumulative effects to mineral and wildlife resources from establishing a new corridors or links in Nunavut's transportation network.

As Nunavut continues to promote business in the north, the reality of limited transportation links in a remote landscape continue to surface and provide proponents and impact assessment practitioners a sizeable challenge.

Key words: *transportation, Nunavut*

SEA TO SKY HIGHWAY AND ACID ROCK DRAINAGE: A MODELING APPROACH TO ASSESSMENT OF POTENTIAL ENVIRONMENTAL EFFECTS

Mallen, Neil D.
Golder Associates Ltd.
500 - 4260 Still Creek Drive
Burnaby, BC V5C 6C6 Canada
+1 604 296 4256 Fax: +1 604 298 5253
nmallen@golder.com
www.golder.com

Ross, Cheryl S.
Golder Associates Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052 USA
+1 425 883 0777 Fax: +1 425 882 5498
cross@golder.com
www.golder.com

The B.C. Ministry of Transportation is proposing to upgrade the Sea-to-Sky Highway between Horseshoe Bay and Whistler. This is one of the commitments made in the City of Vancouver and Resort Municipality of Whistler bid to host the 2010 Winter Olympic Games. This highway traverses steep and mountainous terrain. As such, the road improvements will require substantial rock cuts.

Golder Associates Ltd. assessed the potential for acid rock drainage and metal leaching (ARD / ML) from proposed rock cuts and the environmental impact on the rivers and streams along the highway alignment, and on Howe Sound[CR1]. This assessment was incorporated into the application for a Project Certificate that is required under the British Columbia Environmental Assessment Act.

No regulations or guidelines exist in British Columbia to guide the analysis of potential reactive rock material encountered during road construction or the assessment of potential environmental effects from this material. Consequently, an assessment methodology was developed using guidelines established for the mining industry (Price, 1997).

The environmental impact assessment involved geological mapping and laboratory testing to characterize the ARD / ML potential of rocks along the highway. Results of the ARD / ML testing were coupled with the results of a hydrologic analysis to predict metal loading to streams. The predicted stream concentrations were assessed in the context of sensitive aquatic organisms known to occur in the drainages.

The potential environmental effects from handling and disposal of excavated rock were also considered and mitigation options proposed.

This paper will focus on the methodology employed and the extent to which it may be transferable to other construction projects. The unique characteristics and challenges of the Sea to Sky corridor project will be highlighted.

Key words: *Sea-to-Sky highway, acid rock drainage/metal leaching, British Columbia Environmental Assessment Act*

IPM IMPACT ASSESSMENT AND THE ART AND SCIENCE OF RISK COMMUNICATION

Lagnaoui, Abdelaziz
The World Bank
1818 H Street, NW, Washington , DC 20433 USA
+1 202 458 2806 Fax: +1 202 477 0565
alagnaoui@worldbank.org
www.worldbank.org

Santi, Emanuele
The World Bank
+1 202 473 2281
esanti@worldbank.org
www.worldbank.org

Farmers and consumers in developing countries are too often faced with a serious dilemma: either sacrifice a significant share of their crops to pests or use highly toxic pesticides that can harm human health and the environment. If we can help these people out of this dilemma, we will be making a major contribution to improving food security, eradicating starvation, and alleviating poverty in resource-poor countries throughout the world. Recognizing the importance of agricultural inputs in food security and the reputational risk associated with the use of very toxic agricultural chemicals, the World Bank developed revisited on integrated pest management (IPM) to ensure good practice in its projects. IPM succeeded in developing environmentally sound practices but struggled to communicate the value of information on risk and benefits of IPM. The slow adoption of IPM is often attributed to the widespread gaps in farmers' knowledge and understanding of the complex and controversial issues surrounding pesticides and IPM . In this paper, we will address IPM and risk assessment not only from the economic, environmental and public health perspective, but also from a communication and consensus building point of view. Communicating about IPM, pesticides and associated risks hinges on the ability to earn the public's confidence, raise its awareness and understanding and addressing their perceptions .Risk communication, defined as an interactive process of exchanging information and opinions among individuals, groups and institutions (NRC, 1989), is a challenging task. It provides multiple messages about the nature of risk and other messages that express concerns, opinions, or reactions to risk messages or risk management. It therefore implies a deep capacity to listen to different stakeholders in a systematic and scientific way, but also the creativity to elaborate multi-faced communications programs which can help bridging the gaps between knowledge, behaviours and practices.

Key words: *integrated pest management, pesticides, risk communication, public participation, impact assessment*

USING ENVIRONMENTAL ASSESSMENT TO UNDERSTAND AND MANAGE THE EFFECTS OF OIL SANDS DEVELOPMENT IN NORTHERN ALBERTA

North, Laury
Alberta Environment
111 Twin Atria 4999 - 98 Avenue
Edmonton, AB T6B 2X3 Canada
+1 780 422 2207 Fax: +1 780 427 9102
laury.north@gov.ab.ca

Alberta uses environmental assessment as a means of understanding the effects of major industrial, water management and recreational developments. As the scale of development has changed, so has the province's approach to understanding and assessing environmental effects. This is particularly important in northeastern Alberta where the development of the Fort McMurray-Athabasca Oil Sands is occurring at an unprecedented rate. This paper examines the role of Alberta's Environmental Assessment Process in the regulatory decision-making process for oil sands development. The orderly development of energy resources in Alberta, including oil sands reserves, is regulated by the Alberta Energy and Utilities Board (EUB). Provincial Ministries such as Alberta Environment, Alberta Sustainable Resource Development, and Alberta Community Development may also have regulatory responsibility for various aspect of development. Therefore, Alberta uses an inter-departmental, multi-disciplinary team-based approach to evaluate the integrated application for an oil sands project. This application includes an Environmental Impact Assessment (EIA) Report prepared under Alberta's Environmental Protection and Enhancement Act (EPEA). When federal agencies also have an environmental assessment requirement, provincial and federal agencies conduct a cooperative assessment of the project. A EIA report provides decision-makers and other stakeholders with an understanding of the nature of the project, the environmental and socio-economic setting for the project, the effects of the project on that setting, appropriate mitigation to minimize adverse effects, and systems required to monitor and manage residual adverse effects. Information from the application and EIA report is used by regulatory decision-makers to determine if the project is in the public interest and to identify operating and environmental management requirements. Approvals issued by Alberta Environment provide long-term management of regulated activities and protection of environmental quality.

Key words: *Oil Sands, EIA report, EPEA, team-based review, environmental management systems*

IMPACT ASSESSMENT OF SCALE CHOICES IN SCOPING

Karstens, Sonja
Delft University of Technology
Jaffalaan 5, Delft, Zui-Holland 2600 GA Netherlands
+31 15 2787452
sonjak@tbm.tudelft.nl

Bots, Pieter
Delft University of Technology
+31 15 278 2948
pieterb@tbm.tudelft.nl

Selecting a scale for the scoping of the problem is an important and challenging activity at the start of any SEA or EIA study. This activity often does not receive the amount of attention it deserves. The adoption of a particular scale in a study sets bounds on the types of problems addressed, the kind of solutions to be found and the kind of impacts to be evaluated. It is therefore important to realise that scale has a strategic value and is not politically neutral: the selection of scale may intentionally or unintentionally privilege certain stakeholders. For this research a distinction is made between three types of scale choices that are closely interrelated:

- Selection of spatial scale: large (river basin, national) or small (channel, local)
- Selection of local of temporal scale: long term or short
- Selection of level of aggregation: amount of detail.

The selection of scale always involves a trade-off because no perfect scale exists. Some examples of dilemmas that may play a role in making scale choices:

- Long term versus short term interests. Long term and short term interests may be conflicting. Economic considerations are primarily based on short term objectives whereas ecological concerns have a long term scope.
- Small scale versus large scale (system boundaries): By broadening the scope, more (and maybe better) solutions may come into the picture, but this also involves more complexity. Also, on a larger scale, more impacts may be taken into account. In this paper, examples in water management (Scheldt Estuary, water shortage) will be used to illustrate how scale choices are made in practice and what the consequences of scale choices are for the outcomes of interests of the scoping and the assessment. The point will be made that scale choices can be used as a framing instrument.

Key words: *scoping, scale choices, assessment*

RANDLE REEF SEDIMENT REMEDIATION: ENGAGING PUBLIC PARTICIPATION

Allan, Sheila
Environment Canada-Ontario Region
867 Lakeshore Road, Burlington, ON L7R 4A6 Canada
+1 905 336 4948 Fax: +1 905 336 8901
sheila.allan@ec.gc.ca

Shaw, John
Great Lakes Sustainability Fund
Environment Canada-Ontario Region
+1 905 336 6273 Fax: +1 905 336 6272
john.shaw@ec.gc.ca

Randle Reef, at the west end of Lake Ontario, has the greatest concentration of highly toxic sediment within Hamilton Harbour. The sediments contain elevated levels of PAHs, which are persistent and carcinogenic and enter the food chain through fish, zebra mussels and other organisms. Randle Reef is among Canada's highest priorities for remedial action within the Great Lakes Basin.

Since 1995, there has been considerable input from stakeholders regarding the management of Randle Reef sediment. Major issues and concerns related to the various alternatives included the high costs and health risks of removal and treatment, lack of recipient sites for the removed material and infilling the harbour if contained in situ. These resulted in barriers to proceeding with a preferred approach.

In November 2001, Environment Canada formed a multi-stakeholder Project Advisory Group (PAG) to develop a mutually acceptable solution for Randle Reef. Participants represented 17 organizations, including federal, provincial and municipal governments, industry, shipping, local citizens, environmental non-government organizations, workers' safety, and technical experts. In a series of meetings, PAG members expressed the interests of their constituencies and voted on project alternatives.

The PAG meetings enabled stakeholders to agree on a solution that had been ruled out during earlier phases of the environmental assessment: construction of a dry cap dyked containment facility about 9.5 ha (hectare) in size, to cover in-situ about 130,000 m3 of PAH-contaminated sediments and contain an additional 500,000 m3 from other toxic areas in the Harbour. Its proposed end use will be a mix of 1/3 naturalized open space and 2/3 port activities that include commercial storage and a channel suitable for ships of Seaway draught.

The Randle Reef Sediment Remediation project is undergoing a Comprehensive Study under the Canadian

Environmental Assessment Act. The proposed cleanup activities are anticipated to commence in fall 2004.

Key words: *public participation, stakeholder, Canadian Environmental Assessment Act, sediment remediation, PAGs, Great Lakes, Randle Reef, Ontario, Canada*

HOW ARE IMPACTS ON BIODIVERSITY ANALYSED IN EIA IN SWEDEN?

Oscarsson, Antoienette; Kjellander, Cecilia
Swedish EIA Centre
Swedish University of Agricultural Sciences (SLU)
P.O. Box 7012, SE-750 07 Uppsala Sweden
+46 18 67 1957 Fax: +46 18 67 3512
antoienette.oscarsson@lpul.slu.se
cecilia.kjellander@lpul.slu.se
www-mkb.slu.se

De Jong, Johnny
The Swedish Biodiversity Centre
P.O. Box 7007, SE-750 07 Uppsala Sweden
+46 18 67 10 71 Fax: +46 18-67 34 80
Johnny.de.Jong@cbm.slu.se
www.cbm.slu.se/engelska/index.htm

The objective of this study was to investigate the implementation of the Convention on Biological Diversity (CBD) regarding EIA (article 14) and to study how impacts on biodiversity is analysed in Swedish EIA-documents.

The result shows that biodiversity in general is described in EIA-documents, especially influence on different habitats. However, species other than red-listed are seldom included, the landscapes are almost never analysed in ecological terms and field data is often very poor. There are also differences between sectors regarding how biodiversity is included in the EIA-documents, and in quality depending on whether the EIA is carried out by the project proponent or by a consultant. There are however examples of very good EIA-documents, especially those made for big road and railways projects by a group of experts. Nevertheless, the main problem with most EIAs is that long-term impacts on biodiversity are not included. Prediction tools to analyse effects of different projects are not used and normally such methods are not even requested by the authorities. From this we conclude that the quality of EIA-documents concerning impacts on biodiversity is low and must be improved in order to fully implement CBD article 14 in Sweden.

The result is based on 274 analysed EIA-documents from different sectors (industry, roads, railway etc.). This was combined with interviews of a number of key persons representing local and regional authorities, proponents and consultants with experience of EIA.

More specific we studied what kind of data EIA is based on, how data is presented and referred to, how species, habitats and landscapes are described, how consequences on biodiversity is analysed and what kind of prediction tools that are used.

Key words: *Convention on Biological Diversity, EIA, biodiversity, Sweden*

CUMULATIVE IMPACT ASSESSMENT FOR MUNICIPAL AND REGIONAL PLANNING—AN OUTLINE OF A SWEDISH RESEARCH PROJECT

Oscarsson, Antoienette; Rapaport, Eric; Wallentinus, Hans-Georg
Swedish EIA Centre
Swedish University of Agricultural Sciences (SLU)
P.O. Box 7012, SE-750 07 Uppsala Sweden
+46 18 67 1957 Fax: +46 18 67 3512
antoienette.oscarsson@lpul.slu.se
www-mkb.slu.se.

Research on cumulative impact assessment has shown that small cumulative impacts may result in greater environmental disturbances than a single particular action. Cumulative EIA (CEIA) is demanded by the European Union. However, CEIA is still not included in Swedish legislation.

The Swedish Environmental Code, states that the Swedish County Boards are responsible for determining - in parallel to the project developer - which types of impacts are to be assessed in the EIA, including in relation to other projects and plans.

The objective of this project is, firstly, to make a review of the international research surrounding the issue of cumulative impact assessment. Secondly we will study why cumulative impact assessments are being conducted. Thirdly, the research aims to demonstrate a method for conducting cumulative impacts assessment that will be possible to use in municipal and regional planning as well as for environmental protection and management.

The Swedish Environmental Protection Agency has not released any guidelines regarding CEIA. The reason behind this will be investigated in this research. No specific methodology for Cumulative environmental impact assessment (CEIA) has been proposed, but models are available from the USA National Council of Environmental Quality (CEQ, 1997) and the Canadian Environmental Assessment Agency (CEAA).

Given that Sweden has a different arrangement of political powers than USA and Canada, the research can bring to light which barriers exists in the implementation of cumulative impact assessment in the Swedish context.

Key words: *EIA, Sweden, cumulative impact assessment*

CONSULTATION PUBLIQUE SUR LE DEVELOPPEMENT DURABLE DE LA PRODUCTION PORCINE AU QUEBEC

Boucher, Louise
Bureau d'audiences publiques sur l'environnement (BAPE)
575, rue Saint-Amable, bureau 2.10
Québec (Québec) G1R 6A6 Canada
+1 418 643 7447/Sans frais : 1 800 463-4732
Télécopieur : +1 418 643 9474
louise.boucher@bape.gouv.qc.ca

Le Bureau d'audiences publiques sur l'environnement (BAPE) est un organisme gouvernemental d'information et de consultation publiques sur les questions environnementales soumises par le ministre de l'Environnement du Québec. Le BAPE contribue au développement durable en donnant accès aux citoyens à l'information sur une problématique et la possibilité de s'exprimer avant l'autorisation par le gouvernement d'un projet ou d'une politique. Le BAPE réalise ses analyses à la lumière du développement durable.

Le 3 juillet 2002, le BAPE recevait le mandat de tenir une consultation publique sur le développement durable de la production porcine au Québec. Le mandat d'un an consistait à :

- examiner les modèles de production actuels et leurs impacts sur les milieux rural et agricole et sur le secteur de la transformation;
- établir un cadre de développement durable de cette production en tenant compte des aspects économiques, sociaux et environnementaux;
- proposer un ou des modèles de production favorisant une cohabitation harmonieuse des activités dans le respect de l'environnement.

La démarche de la Commission comportait trois étapes. Pour rassembler les connaissances, la consultation a débuté avec vingt séances thématiques où 60 conférenciers étaient invités. Ensuite, une tournée dans 16 villes a donné l'occasion aux citoyens de clarifier certains aspects en questionnant, via la Commission, des personnes-ressources de ministères et organismes. Enfin, une deuxième tournée régionale, réservée aux opinions et préoccupations, aura permis de recueillir 380 mémoires provenant de clientèles diverses et d'échanger en audience avec plus de 300 d'entre elles. Au terme de cette démarche et de l'analyse qui a été faite, le rapport, déposé au ministre de l'Environnement le 15 septembre 2003, est le reflet d'une réflexion collective de la Commission et des 9 100 participants aux 132 séances publiques pour analyser la problématique dans une attitude d'ouverture, d'écoute et de respect mutuel.

Mots-clés : *développement durable, participation du public, contribution de la population, analyse d'une problématique, expression des opinions et des préoccupations, méthodologie d'une démarche de consultation publique, examen d'impacts*

THE VISUALIZATION OF IMPACT ASSESSMENT

Carton, Linda
TU Delft, Fac. Technology, Policy and Management
Jaffalaan 5 PO Box 5015
Delft, Zuid-Holland 2600 GA Netherlands
+31 15 278 6571 Fax: ++31 15 278 6439
lindac@tbm.tudelft.nl

Enserink, Bert
TU Delft, Fac. Technology, Policy and Management
+31 15 278 8071 Fax: +31 15 278 6439
berte@tbm.tudelft.nl

Although the role of maps has never been an issue of attention in impact assessment, map images are the most frequently used models in EIAs. In the current age of information, the role of maps has made a fundamental shift from a rational information provider towards a discussion and negotiation instrument. In impact assessment maps are used both to present the current state of affairs and to present the outcomes of the analysis; demarcating the affected from the unaffected, stating the gravity of the impairment or expressing the benefits of the intended project. In this role, maps facilitate the discourse between actors of different disciplines and with different interests and intentions. In today's complex decision-making processes a scarce resource of the stakeholders is attention. In the dynamic and creative process of defining alternatives, some issues and problems are implicitly qualified as important to address. Those issues are paid attention to and visualized on maps. Perhaps even more important is what is NOT included. We have analyzed this process in several case studies. The cases show many occurrences of strategic use and at times counter-effective map use. Often this was due to a difference in intention, approach, line of reasoning (rationality) and vocabulary of participants. Concluding: maps are powerful tools for communication, but the message they convey is hard to control. The current use of maps in impact assessment as a device for presentation inhibits their potential use as powerful communicators. When used in the right way maps can have a constructive role as a tool for arousing creativity and for expressing and discussing options. Different visualization approaches and conscious map use in the strategic and design phases of EIA preparation is expected to lead to an improved discourse between participants.

Key words: *map visualization, rationalities, strategic behavior, communication*

SIA AND THE MINING INDUSTRY: EVOLVING EXPECTATIONS

Hamilton, James
Golder Associates Ltd.
1000, 940 - 6th Avenue SW, Calgary, AB T2P 3T1 Canada
+1 403 299 5600/+1403 260 2272
Fax: +1 403 299 5606
Jim_Hamilton@golder.com

Private sector investors who want to develop resource-based projects are required to follow precise permitting procedures determined by the regulators. Government requires that an environmental assessment be conducted which ensures that a defined process is followed so as to predict the environmental and social effects of proposed initiatives before they are implemented. Social impact assessments (SIAs) allow for the identification of possible negative effects as well as formation and selection of project implementation activities that can contribute to sustainable development by introducing measures which ensure negative impacts are avoided or mitigated. When required or appropriate, an environmental monitoring program is designed and implemented to verify that the environmental impact assessment was accurate as well as to determine performance and effectiveness of the mitigation measures. Although follow-up monitoring is an accepted practice in the environmental assessment process, it is at the nascent stages in the private sector. For the International Financial Institutions (The World Bank, Asian Development Bank, African Development Bank, etc.) and bilateral aid agencies (CIDA, USAID, DFID, etc.), project evaluation is a widely accepted and well-defined practice which, when conducted at the mid-term review stage of a project, can provide valuable results-based operational lessons so that adjustment can be made to strategy, structure and methods of implementation if appropriate and/or feasible. This paper will discuss moving beyond SIA follow-up monitoring to incorporate more formalized evaluation techniques which measure project mitigation implementation in terms of their relevance, efficacy, impacts, sustainability and, where appropriate, efficiency. Examples will be drawn from the mining sector.

Key words: *environmental assessment, social impact assessment, follow-up monitoring, evaluation*

CHALLENGES AND APPROACHES IN ENVIRONMENTAL IMPACT ASSESSMENTS: WIND TURBINES AND MIGRATORY BIRDS

Robinson, Andrew
Canadian Wildlife Service
Environment Canada
5491 Robinson Road, Delta, BC V4K 3N2 Canada
+1 604 940 4685 Fax: +1 604 946 7022
andrew.robinson@ec.gc.ca
www.ec.gc.ca

La Rusic, Adam
Environmental Protection Branch
Environment Canada
201-401 Burrard Street, Vancouver, BC V6C 3S5 Canada
+1 604 666 8342 Fax: +1 604 666 7294
adam.larusic@ec.gc.ca
www.ec.gc.ca

The environmental impact assessment (EIA) process is a project development planning tool. Applied on a project-by-project basis, its primary purpose is to identify and mitigate potential negative impacts on important ecosystem components. An inherent difficulty is that project-specific level planning is not useful or even applicable to assessments at the regional level, which should be the approach used to assess wind farms. Environment Canada (Pacific and Yukon Region) has participated in several on- and off-shore wind farm EIA reviews and has three primary concerns with respect to migratory birds: 1) direct mortality due to collisions with turbine blades and related structures; 2) displacement of sensitive species from important areas or habitat types at critical times; and 3) cumulative negative effects at the population level for some vulnerable species. Non-avian impacts include road construction and transmission line corridors. Gaps exist in our understanding of the likelihood and extent of these effects. In this paper, we discuss a planning tool - an inference-based model at the landscape level - that could be used by government agencies and developers to help determine the best locations for wind farm facilities in British Columbia. In its development, important bird migration pathways would need to be identified, and correlated to time of year, wind strength and consistency, topography, and selected habitat features. Proximity to existing road and transmission networks must also be considered. The data collected from EIAs and other programs could be used to provide feedback to the model, in an adaptive management framework. We also discuss various challenges in monitoring facility impacts, including cumulative environmental effects.

Key words: *migratory birds, model, monitoring, adaptive management, environmental impact assessment*

THE STRATEGIC ENVIRONMENTAL ASSESSMENT PROCESS—A CASE STUDY OF JAMAICA

Emanuel, Elizabeth
CIDA Environmental Action (ENACT) Programme
3rd Floor, 10 Caledonia Avenue, Kingston 5, Jamaica
Affiliation: NEPA / Government of Jamaica
+1 876 754 7588 Fax: +1 876 754 7597
eemanuel@mail.infochan.com

Pelletier, Jean-Pierre
Dessau-Soprin International
1060, University Street, Montréal QC H3B 4V3 Canada
+1 514 281 1033 ext. 2720 Fax: +1 514 281 1060
jean-pierre.pelletier@dessausoprin.com

Today, it is widely accepted that the integration of environment and development concerns can lead to the fulfillment of basic human needs. The Government of Jamaica has recognized that for achieving full economic and social development, the environmental costs and benefits of all processes must be evaluated. This approach towards realising that government as an entity can have negative impacts on the natural environment has resulted in the Government of Jamaica taking the appropriate steps towards incorporating environmental considerations into its policies, plans, programmes and operations.

Through the CIDA-sponsored Environmental Action (ENACT) programme and its implementation by the Canadian consortium Dessau-Soprin / Marbek, the Government of Jamaica is currently implementing a Greening of Government Programme, with a major focus on Strategic Environmental Assessment (SEA) process and policy. The Cabinet Office articulated that the introduction of a SEA process would represent an explicit acknowledgment that ministries of GOJ share a responsibility for environmental protection, are partly responsible for the current state of Jamaica's natural environment, and therefore need to consider the environmental implications of their policies.

The focus on SEA has come against a backdrop of policy making in the Government of Jamaica being described as rushed, reactive, focused on short-term considerations and suffering from the absence of a common approach to guide analysis. The GOJ has now adopted a number of measures aimed at strengthening its policy-making processes in order to address the deficiencies outlined.

This paper will present and analyse the following:

- The process of development of the SEA initiative
- A review of the GOJ SEA Policy and the institutional mechanisms required for implementation
- An outline of green procurement practices and how it may impact on the local industrial sectors
- The achievements, challenges, drawbacks, lessons learnt and applicability for other SEAs

Key words: *capacity building, greening of government, strategic assessment, policy making, green procurement, impact on industrial sectors*

IMPACT ASSESSMENTS AND SUSTAINABLE DEVELOPMENT IN CANADIAN URANIUM MINING

Vance, Robert
Government of Canada
Natural Resources Canada
580 Booth Street, Ottawa, ON K1A 0E4 Canada
+1 613 996 2599 Fax: +1 613 947 4205
rvance@nrcan.gc.ca

All stages of uranium mine development in Canada meet rigorous environmental standards and environmental assessment is a component of several steps in the process. In the early 1990s, new uranium mine developments proposed for northern Saskatchewan were reviewed by a joint federal-provincial environmental assessment panel. This seven-year long process spanned a broad range of issues in technical and public panel hearings throughout northern Saskatchewan. Recommendations from the joint panel laid the groundwork for the development of an environmentally sustainable industry that places a high premium on community involvement. An environmental assessment panel that addressed the decommissioning of uranium mines in the Elliot Lake region of Ontario, exerted a similar influence on the outcome of the recently completed decommissioning process.

Uranium mining companies in Saskatchewan devote significant effort to environmental protection in all phases of the operations. All tailings are disposed of in engineered, mined-out open pits to minimize long-term environmental impacts. Ongoing programs and incentives that facilitate the training and employment of local residents in the mines and mills and that promote local business development have been formally recognized by national aboriginal organizations that consider uranium mining companies to be pioneers in such activities. Community trust and involvement is promoted by environmental quality committees staffed by local residents.

Environment reviews of proposed uranium mine developments include decommissioning plans. All currently operating facilities are required topost financial guarantees for the full cost of the decommissioning prior to receiving a licence to operate. Recently decommissioned uranium mining facilities in Elliot Lake Ontario, the centre of uranium mining in Canada for over four decades, demonstrate that large volumes of potentially acid mine generating and mildly radioactive waste rock can be successfully contained and treated in a cost effective fashion.

Key words: *uranium, mining, tailings, acid mine waste, radioactive waste, environmental assessment, sustainable development, community involvement, training and employment*

ENVIRONMENT AGENCY GOOD PRACTICE GUIDELINES FOR STRATEGIC ENVIRONMENTAL ASSESSMENT

Carroll, Barbara
Enfusion
Treenwood House, Rowden Land
Bradford on Avon, BA 15 2AU UK
+44 –1225 867112 Fax: +44 01225 867115
Barbara.carroll@enfusion.co.uk

Stewart, Gerard
Environmental Policy - Risk and Forecasting
Environment Agency
Kings Meadow House, Kings Meadow Road
Reading RG1 8DQ UK
+44 118 953 5253 Fax: +44 118 953 5265
gerard.stewart@environment-agency.gov.uk

The Strategic Environmental Assessment (SEA) Directive comes into force in the UK in July 2004. It aims to provide for a high level of environmental protection and to integrate environmental considerations into the preparation and adoption of certain plans and programmes programmes with a view to promoting sustainable development. The Environment Agency (the 'Agency') is the most important environmental advisor and regulator in England and Wales and will be a statutory consultee in the SEA process.

The Directive presents major opportunities and challenges that have prompted the Agency to prepare generic web based good practice guidelines. The guidelines are aimed at external plan and programme makers including public authorities and industry, their consultants and other stakeholders in the SEA process. The guidelines will set out the Agency's role, promote good practice approaches, promote links with Agency water management planning and complement other SEA guidance.

The guidelines are being developed using a staged process involving a high level of engagement with Agency and external stakeholders including representatives from national, regional and local government, industry, professional institutes, statutory agencies and non statutory organisations.

This paper discusses the development of the guidelines and in particular how the stakeholder engagement has facilitated their preparation.

Key words: *strategic environmental assessment directive, good practice guidelines, environment agency, sustainability*

NORTHERN WOOD PRESERVERS SITE SEDIMENT REMEDIATION: EA FOLLOW-UP PROGRAM

Dobos, Rob
Environmental Assessment Section
Great Lakes and Corporate Affairs Office
Environment Canada-Ontario Region
867 Lakeshore Road, Box 5050
Burlington, ON L7R 4A6 Canada
+1 905 336 4953 Fax: +1 905 336 8901
rob.dobos@ec.gc.

Santiago, Roger
Great Lakes Sustainability Fund
Environment Canada-Ontario Region
4905 Dufferin St.
Downsview, ON M3H 5T4 Canada
+1 416 739 5876 Fax: +1 416 739 4342
roger.santiago@ec.gc.ca

The Northern Wood Preservers site, at Thunder Bay Harbour on Lake Superior, was recognized as a priority toxic sediment hotspot requiring remedial action on the Canadian Great Lakes. The sediments contained elevated levels of PAHs and low levels of dioxins and furans, some at levels acutely lethal to fish, degrading water and sediment quality and benthic community structure.

Following several years of investigation into remedial approaches, a partnership was formed in 1996 between government and industry to carry out a sediment remediation project. The partners included Environment Canada, Ontario Ministry of Environment, Abitibi-Consolidated Inc., Canadian National Railway Company and Northern Wood Preservers Inc. (NWPI). The remediation project involved: construction of a bermed containment area surrounding the NWPI pier and area of highest contaminated sediments which was later infilled and capped; installation of groundwater isolation barrier adjacent to the NWPI pier; dredging of all acutely toxic sediments; operation of on-site treatment facility for toxic sediments; and creation of new aquatic and terrestrial habitats nearby.

The project was subject to a comprehensive study under the Canadian Environmental Assessment Act. The responsible authorities were Environment Canada due to funding and Fisheries & Oceans Canada due to regulatory approvals. The comprehensive study was completed in mid-1997, project implementation began thereafter and was completed in 2003.

A condition of the federal Environment Minister's decision on the comprehensive study was to design and implement a follow-up program to determine the effectiveness of mitigation measures undertaken and verify the accuracy of the EA predictions. The follow-up program developed by the Ras included monitoring of: surface water quality during construction; groundwater post-construction; the newly created aquatic and terrestrial habitats; noise and odours; health and safety compliance; cumulative effects; and monitoring for any malfunctions or accidents. This paper will discuss the purpose, design and implementation of the follow-up program, report on the results, and discuss how they affected changes to the project implementation.

Key words: *follow-up, Canadian Environmental Assessment Act, sediment remediation, Great Lakes, Northern Wood Preservers, Thunder Bay, Ontario, Canada*

COMPARATIVE ANALYSIS OF IMPACTS OF TWO FORMS OF LOCAL OWNERSHIP

Varghese, Jeji; Krogman, Naomi
University of Alberta
515 General Services Building
Edmonton, AB T6G 2H1 Canada
+1 780 492 4178 Fax: +1 780 492 0268
jeji@ualberta.net

This paper evaluates the extent to which anticipated societal benefits accompany local ownership. Locally owned mills and locally controlled forest tenure offer a corporate alternative, and a way for local people to have greater participation in forest management and ostensibly an opportunity to gain greater economic, social, and ecological benefits from the forest. In this paper we present an in-depth analysis of the social impacts of two forms of local ownership, one located in Meadow Lake, Saskatchewan and the other in Revelstoke, British Columbia. The Meadow Lake case involves local ownership of a forest product mill, and in the Revelstoke case, a community partnership obtained a long-term tree license for timber near their community. Using these two cases, we investigate how local ownership of a forest products mill (ownership as exclusive dominion) compares with local control over forest tenure (ownership as a bundle

of rights) in terms of socio-ecological, socio-economic and social benefits to community members. The findings suggest that socio-ecological and social benefits do not necessarily follow after local ownership is obtained. In addition, different types of local ownership yield similar socio-economic benefits but not necessarily similar socio-ecological or social benefits, which suggests different types of local ownership may result in different societal benefits.

Key words: *local ownership, ex-post social impact assessment, forest community, community corporation*

STRATEGIC ENVIRONMENTAL ASSESSMENT OF OIL AND GAS EXPLORATION ACTIVITIES IN THE NEWFOUNDLAND AND LABRADOR OFFSHORE AREA

Coady, Kim
Canada-Newfoundland Offshore Petroleum Board
5th Floor TD Place, 140 Water Street
St. John's NL A1C 6H6 Canada
+1 709 778 1431 Fax: +1 709 778 1432
kcoady@cnopb.nf.ca • www.cnopb.nfnet.com

The Canada-Newfoundland Offshore Petroleum Board (C-NOPB) is the federal-provincial authority that regulates petroleum exploration and production activities offshore Newfoundland and Labrador. Recently, the C-NOPB has undertaken strategic environmental assessment of offshore oil and gas exploration activities in support of its rights issuance process. Under this Process, the C-NOPB offers parcels of land in the offshore area for bid to interested parties at the Call for Bids stage. Parties successful in the Call for bids, are issued exploration licences by the C-NOPB. An exploration licence grants the interest holders the exclusive right to explore for petroleum resources on that licence. Strategic Environmental Assessment at the Rights Issuance Stage enables the Board to better understand the environmental issues and concerns that may exist in the area, and use this information in determining whether to issue lands or place restrictions on activities. To date, SEAs undertaken by the Board have focussed on oil and gas exploration and seismic activities. This paper will provide an overview of the Board's regulatory structure and describe the SEA process undertaken by the Board. Two recently completed SEAs for offshore oil gas exploration activities will be described. Impacts on decision making by the Board will be highlighted. In addition, the lessons learned from conducting each SEA will be addressed.

Key words: *strategic environmental assessment, offshore oil and gas*

ENVIRONMENTAL ASSESSMENT INSTITUTIONAL CAPACITY BUILDING IN INFRASTRUCTURE PROJECTS PUBLIC POLICY TO STIMULATE PRIVATE INVESTMENT: REVIEW OF GOOD IMPLEMENTATION CASES

Kaya, Gediz
The World Bank
1818 H St NW, Washington DC 20433 USA
+1 202 458 5365 Fax: +1 202 477 0565
gkaya@worldbank.org

Mercier, Jean-Roger
The World Bank
+1 202 473 5565 Fax: +1 202 477 0565
jmercier@worldbank.org

Ijjasz-Vasquez, Ede Jorge
The World Bank
+1 202 473 1870 Fax: +1 202 477 0565
eijjasz@worldbank.org

Environmental Assessment Institutional Capacity Building in Infrastructure Projects Public Policy to Stimulate Private Investment Review of Good Implementation Cases
Infrastructure projects in the World Bank portfolio have in several instances targeted capacity building or enhancement in environmental assessment and management (EA&M) institution building. In that process, the national policy makers and the implementers of the Bank gained experience in building transparent, effective and sustainable institutions. This study aims to review the experiences gained so far and make the information available for the next round of EA&M capacity building efforts in the sector. Evidence shows that Foreign Direct Investors value the existence of a reliable, robust and predictable national EA&M institution operating in a transparent way. A concentrated review was completed among all World Bank infrastructure projects that have an EPI (environmental policy and institutions) component and were activated after 1992. A brief survey was conducted among the task managers of these projects. The survey was used to retrieve brief and concise information about the outcomes of each project in terms of institutional building and support for EA&M. The survey served as the fastest way of identifying good practices and getting specifics on these practices. An important part of the study is to document the policy and implementation improvements in EA capacity of the line ministries and agencies by analyzing the results of the projects over time. The outcome of this global review depicts how and at what level the World Bank infrastructure projects assist in environmental assessment institutional capacity building.

Key words: *improved environmental regulations, environmental assessment, institutional capacity building*

INCORPORATION OF ADAPTATION TO CLIMATE CHANGE INTO THE EIA PROCESS: APPLICATION OF A PRACTITIONER'S GUIDE IN THE DEVELOPED AND DEVELOPING WORLD

Collins, Norval (CEF Consultants Ltd.); Bell, Alan (Alan Bell Environmental Management Consulting); Young, Robert (Dillon Consulting Ltd.)
Members of
ClimAdapt
5151 Terminal Rd, 5th Floor
P.O. Box 697, Halifax, NS B3J 2T8 Canada
+1 902 424 4729 Fax: +1 902 424 357
www.climadapt.com

Mercier, Jean-Roger
Environmental Assessment, Quality Assurance and Compliance Unit (ESDQC)
World Bank
1818 H Street NW, Washington DC 20433 USA
+1 202 473 5565 Fax: +1 202 477 0565
jmercier@worldbank.org.

A guide to incorporate adaptation to climate change into the EIA process will be described, along with its application to the developed and developing world.

The Guide was developed by members of ClimAdapt, a network of private sector, government and NGOs in Nova Scotia, Canada. The 25-page guide provides an understanding of the implications of climate change in relation to the preparation of an EIA; direction on determining on a project-specific basis whether climate change needs to be considered; sources of information for use in assessing climate change implications, and guidance in incorporating climate change considerations into the EIA process.

The Canadian Environmental Assessment Agency funded a study to apply these guidelines to six case studies using past EIAs from major projects across Canada. Objectives of this study included testing the process and procedures on existing environmental assessments; evaluating the effectiveness of guidance provided on climate change model predictions; and evaluating whether the Guide can be used as a generic framework capable of adaptation to other environmental assessment processes.

This experience is then theoretically applied to the developing world based on analysis of climate change issues by the World Bank. The interest from the World Bank stems from recognition that climate change is happening and will increasingly affect the poor, and that adaptation in developing countries is necessary. There is thus a need to integrate responses to climate change and adaptation measures into strategies for poverty reduction to ensure sustainable development. The authors will report on the first efforts to apply the guide to the Strategic Environmental Assessment process and how it could influence funding programs at the Bank.

Key words: *EIA, climate change, SEA, adaptation, sustainable development, developing countries*

APPLYING A REGIONAL STRATEGIC ENVIRONMENTAL ASSESSMENT APPROACH TO THE MANAGEMENT OF OFFSHORE OIL AND GAS DEVELOPMENT

Horvath, Celesa L.
Corporate Responsibility and Regulatory Affairs
Jacques Whitford
Suite 500, 708 11th Avenue SW
Calgary, AB T2R 0E4 Canada
+1 403 781 5493
chorvath@jacqueswhitford.com

Barnes, Jeffrey
Environmental Assessment and Planning
Jacques Whitford
P.O. Box 1116, Fredericton, NB E3B 5C2 Canada
+1 506 457 3200
jbarnes@jacqueswhitford.com

Strategic environmental assessment (EA) involves the evaluation of potential environmental effects of a policy, plan, or program. A strategic EA may be applied to assess the potential outcomes of a policy, plan, or program in a defined geographical area or for a specific industrial sector. Strategic EA is normally undertaken earlier in the overall planning of resource management than project-specific assessment, and therefore offers key benefits that may improve the quality of resource management generally and project-specific environmental assessment in particular. These benefits may include broader stakeholder engagement, earlier identification of sensitive areas, establishment of development or impact thresholds, and streamlining of project-specific EA and regulatory processes, among other potential benefits. This paper will review current practice in regional strategic EA in Canada and internationally, and explore how regional strategic EA may be applied to improve the management of offshore oil and gas development.

Key words: *regional strategic environmental assessment, oil and gas development, streamlining EA process*

ON THE MONETARY VALUATION OF TRANSPORT RELATED ENVIRONMENTAL IMPACTS WITHIN A STRATEGIC LEVEL OF ASSESSMENT

Arsenio, Elisabete
LNEC
Av. do Brasil 101, Lisboa 1700-066 Portugal
+35 1218443326 Fax: +35 1218443029
elisabete.arsenio@lnec.pt

The Manual on Strategic Environmental Assessment of Transport Infrastructure Plans commissioned by the European Commission refers that different transport

alternatives may be evaluated using the monetary valuation of some of the impacts, by means of an extended cost-benefit analysis framework. This paper is drawn from recent experiences in Portugal in evaluating the costs and benefits of alternative transportation infrastructures and the inclusion of the monetary valuation of some of their environmental impacts. Whereas this appraisal procedure aims to promote sustainability in the transport sector, it also stimulates a more integrated impact assessment and the awareness of decision makers to relevant environmental costs (to avoid) and environmental benefits (to take). Considering the country context and practice, further improvements towards a more comprehensive (and effective) strategic environmental assessment of transport infrastructures can be outlined. The emerging focus on environmental valuation is discussed.

Key words*: strategic environmental assessment, transportation, valuation of environmental impacts*

ADAPTING IMPACT ASSESSMENT TO THE NATURE OF THE DECISION PROCESS

Schijf, Bobbi
Laan van Meerdervoort 670
2564 AL Den Haag, The Netherlands
+31 70 3250837
bobbischijf@wanadoo.nl

Why do impact assessment reports often seem to be of limited influence on the project authorisation decisions for which they are produced? In this paper I argue that one of the most important impediments to impact assessment effectiveness is the gap between the impact assessment process and the decision-making process. Too often the impact assessment report is regarded as the final, stand-alone product of impact assessment. However, the decision processes that the impact assessment reports feed into can vary in nature, certainly between jurisdictions, but even within them, and the information needs differ accordingly. Consequently, if the impact assessment information is not carefully tailored to the specific decision-process it informs, it will have less impact on the decision.

In this paper I argue for an analysis of the decision processes that impact assessment reports feed into, both at the level of the impact assessment system and at the more detailed level of each IA-based project authorisation decision. Drawing decision theory from other disciplines into the field of impact assessment, something repeatedly called for in recent impact assessment literature, can help to clarify the distinctions between different IA-based decision processes, and identify the information needs of each.

On the basis of experience with a range of impact assessment case-studies in New Zealand, I illustrate how different types of decision processes lead to different information needs, and a corresponding differentiation in impact assessment requirements.

Key words: *EIA effectiveness, decision-making, decision theory, New Zealand*

CULTURAL CUMULATIVE IMPACT ASSESSMENT IN CANADA'S FAR NORTH

Ehrlich, Alan J.; Sian, Sherry
Mackenzie Valley Environmental Impact Review Board
Box 938, 5102-50th Ave., Yellowknife, NT Canada
+1 867 766 7056 Fax: +1 867 766 7074
aehrlich@mveirb.nt.ca
ssian@mveirb.nt.ca
www.mveirb.nt.ca/

Cumulative Impact Assessment is now a standard part of many Environmental Impact Assessment (EIA) processes in Canada and elsewhere. Similarly, the definition of the term "environment" in EIA has broadened progressively since the 1970s, to include, in many instances, socio-economic and cultural considerations. This case study examines a unique EIA which dealt with the combination of these: the assessment of cumulative cultural impacts of four proposed projects, in combination with other past, present and reasonably foreseeable developments.

This EIA was conducted by the Mackenzie Valley Environmental Impact Review Board (MVEIRB), an administrative tribunal in Canada's Northwest Territories. In June of 2003, four separate diamond exploration project were referred to for EIA. Although all four developments were relatively small in scale, and used known technologies, the setting for the projects was an unprotected area of great cultural significance to local Aboriginal groups, containing mass graves and spiritual sites.

Particularly challenging considerations in this EIA included:

- the identification for reasonably foreseeable future projects in mineral exploration
- baseline information issues related to cultural factors in the project area
- the commissioning of an independent regional study by the MVEIRB, as a resource for both proponents and reviewers
- the field compilation of original Traditional Knowledge by Aboriginal parties to the EIA
- mitigation techniques for the minimization and avoidance of cumulative impacts to culture and cultural sites.

Approaches to each of these are described, and are likely applicable to other EIAs.

HOW HAS SEA AFFECTED CANADIAN AGRICULTURAL POLICIES?

Campbell, Ian
Agriculture and Agri-Food Canada
361-930 Carling Avenue, Ottawa, ON K1A 0C5 Canada
+1 613 759 7306 Fax: +1 613 759 7139
campbia@agr.gc.ca

The presentation summarizes the effect of SEA on Canadian farm policy since requirements for SEA were implemented in the early 1990s. Until the 1980s, there was little analysis of the environmental impacts of agricultural programs. Some programs have unintended negative consequences. For example, the LIFT (Lower Inventories for Tomorrow) program in the early 1970s led to a large increase in summerfallow, a practice that raises erosion and lowers habitat value. In 1990, the Canadian government instituted two measures requiring SEA of agricultural policies. (The Farm Income Protection Act, and the Cabinet directive on environmental assessment) At the same time, analytic tools and indicators of environmental impacts were being developed for the farm sector. Since 1990, Canada has instituted major changes in its farm policies: Commodity supports and input subsidies have been replaced by de-coupled programs that stabilize income irrespective of input and output choices. SEAs have been conducted on these policy changes, analyzing the impacts of farm policies on erosion, water quality, wildlife habitat and greenhouse gas emissions. In most cases, SEAs found that reforms would have positive environmental impacts, such as lower erosion and GHG emission levels. The SEA results have facilitated policy reform by reducing uncertainties among stakeholders and the public about possible negative impacts. Knowledge and confidence in environmental analysis is growing, increasing the potential influence of SEA in the future. There is always pressure for short-term program responses to farm income problems. Recently, there has not been a conflict between the environmental and non-environmental objectives of policy responses. Thorough environmental analysis will continue to be needed to ensure that damaging policies are not implemented in the future.

Key words: *SEA, agriculture*

EIA MADE IN THE NORTH

Haefele, Martin
Mackenzie Valley Environmental Impact Review Board
Box 938, 5102-50th Ave., Yellowknife, NT Canada
+1 867 766 7053 Fax: +1 867 766 7074
mhaefele@mveirb.nt.ca • www.mveirb.nt.ca/

Cliffe-Phillips, Kimberley
Mackenzie Valley Environmental Impact Review Board
+1 867 766 7062 Fax: +1 867 766 7074
kimberley@mveirb.nt.ca • www.mveirb.nt.ca/

The adaptation of EIA process to suit regional interests and cultures has led to a variety of approaches to EIA worldwide. A particularly interesting example of this is the Mackenzie Valley Resource Management Act (MVRMA), which provides a unique regulatory and impact assessment regime in the Mackenzie Valley in Canada's North. Based on land claim agreements between Aboriginal groups and the Canadian government, it creates an integrated system for resource management. Key features include Aboriginal co-management and decision making by quasi-judicial boards. EIA under the MVRMA has an unusually broad definition of impact of the environment, to include direct impacts on social, cultural, and heritage resources as well as on wildlife harvesting.

The Mackenzie Valley Environmental Impact Review Board — as the main instrument for Environmental Assessment and Environmental Impact Review - has now had four years of this experience with this "made in the north" EIA process. Key elements of the MVRMA are described, using case studies to show how the Mackenzie Valley Environmental Impact Review Board is implementing these key elements in EIA practice. The presentation will also highlight some of the more interesting differences between the MVRMA approach to EIA and the approach of the Canadian Environmental Assessment Act, which applies to the rest of Canada.

MANAGEMENT OF REGULATORY INDICATORS AND ITS IMPACT OVER INDUSTRIAL SECTOR IN MICHOACÁN STATE - MÉXICO

Pelaez, F. Arturo; Vargas, U. Guillermo
Secretaria De Urbanismo y Medio Ambiente (Suma)
Escarcha 272. Col. Prados de Campestre
+52 443 3140645
apelaez@michoacan.gob.mx
URL: mx.geocities.com/arturi2
suma@michoacan.gob.mx
URL: www.michoacan.gob.mx

In SUMA's Department of Environmental Protection, development indicators with the main purpose of assessing industrial and social impacts due to the reduction of stages within the process have been developed, including Authorizations and Licenses Expedition, specialized education of the technical staff, and the systematization of process. During 2003 the number of requests increased 85% over the previous year, and 110% over the last three years. 220 authorizations and 46 LAUs were sent. 45 technical modifications to the resolutions and 45 modifications to the regulation of the Law of Ecological Protection of Michoacan´s State in matters of impact assessment and environmental risk were presented. The numbers of community complaints were reduced 60% and the efficiency percentage to attend several demands was reduced by 80%. We obtained roughly 3000 data from industrial processes which will be included in the National Report of RETC, under commitments of collaboration by the network.

Key words: *regulatory topics, retc*

PRACTICAL PROACTIVE ENVIRONMENTAL IMPACT ASSESSMENT

Van Velzen, Kevan
City of Calgary
P.O. Box 2100 Station M #8020
Calgary, AB T2P 2M5 Canada
+1 403 268 6448 Fax: +1 403 268 1529
kevan.van.velzen@calgary.ca

Sutherland, Lisa
City of Calgary
+1 403 268 1083 Fax: +1 403 268 1529
Lisa.Sutherland@calgary.ca

Infrastructure Canada Alberta Program (ICAP) goal is to improve the quality of life of all Albertans and build the foundation for sustained long-term economic growth in the 21st century. Over 508 million dollars will be invested by the federal, provincial, and municipal government through ICAP in municipal infrastructure over the next five years. ICAP's first priority is "green " municipal infrastructure. This program focus is on projects related to water and wastewater systems, water management, solid waste management and recycling, and capital expenditures to improve or retrofit the energy efficiency of buildings and facilities owned by the municipalities. Secondary priorities include local transportation, cultural and recreational facilities, infrastructure supporting tourism, telecommunications, high speed Internet access for public institutions, and affordable housing. Applications for projects within the City of Calgary that meet the criteria of ICAP funding are submitted with an Environmental Assessment when required by the Canadian Environmental Assessment Act (CEAA). The environmental assessment information addresses potential environmental impacts that may result from the project's construction and operation and outlines mitigative measures and best practices to minimize these impacts. Upon project commencement, a program to monitoring the mitigation measures required in the EA approval is implemented and followed during the life of the project. Customized inspection checklists are developed for each project, which include the above-mentioned mitigative measures in addition to items addressing municipal bylaws. Inspections include fuel management, spill procedure and policy, erosion and sediment control, emergency response training, hazardous materials handling and recycling. Monitoring data is documented through digital photography, spreadsheets and correspondence with project managers, contractors and subcontractors. The City of Calgary has enhanced the monitoring program with development of corrective actions that address common project issues.

Key words: *ICAP, CEAA, mitigation measures*

CULTURAL HERITAGE? WHEN EIA IS GOOD BUSINESS

Campbell, Ian
The World Bank
1818 H Street, N.W., Mail Stop: MC5-523
Washington, DC 20433 USA
+1 202 473 1649 Fax: +1 202 477 0565
icampbell@worldbank.org

Fleming, Arlene
The World Bank
+1 202 458 8401 Fax: +1 202 477 0565
afleming1@worldbank.org

The cultural heritage component of EIA presents an opportunity for private sector project proponents to enhance their projects, improve their relationship with governments and communities, and burnish their corporate image.

Cultural heritage may be valued not only by government authorities, but also by NGOs, religious bodies, local communities, scholars and tourists. Thus the identification, through EIA, of cultural heritage which is potentially affected by a project, provides opportunities not only to avoid harm, but also to do good, often at little cost. Integrating into mitigating measures such activities as enhancing the condition of cultural sites and artifacts or improving access to them, can expedite a project and win friends at all levels of society. In some cases, significant cultural treasures may come to light during project implementation, providing excellent public relations material and tangible evidence of corporate social responsibility.

The authors present results of research based on a number of case studies, demonstrating a variety of unexpected benefits derived by project proponents through the cultural heritage component. They also present guidance for project proponents and EIA practitioners in addressing this often neglected aspect of EIA.

Key words: *cultural heritage, EIA, corporate social responsibility, corporate relations with governments and communities*

THE IMPACTS OF HUMAN ACTIVITIES ON THE URBAN ATMOSPHERIC ENVIRONMENT

Lee, Hyoun-Young
Department of Geography, College of Science
Konkuk University
270-128 Suyu-dong, Kanbuk-gu
Seoul, 142-879, Republic of Korea
+82 2 905-8202
leekwon@hanmail.net

Land-use patterns have rapidly changed since 1980s in accordance with urbanization in Seoul Metropolitan Region, South Korea. As a result local climate has undergone dramatic change as well, and has confronted with serious environmental problems in various aspects. This study intends to define the land-use changes, and then to show how they have brought about significant changes in local climate.

Satellite data (Landsat_5) for land-use patterns, NOAA AVHRR thermal data for temperature fields and various documents were analyzed to detect the changes of urban environment. Because the urban environment has changed so rapidly that up-to date maps and documents are not available at present, and meteorological station network in city areas are too meager to understand the characteristics of urban climate. Noticeable impacts of urbanization on the atmospheric environment were identified in the study area. The results of the analysis demonstrate that Green Space in the study area decreased from 94% to 62% while urban land-use increased ten times, from 4% to 39% for the period of 1972-1992. The resulting disappearance of biomass caused by urbanization may have implications for local climate. The results also demonstrate that urban climate became dr! ier and warmer due to man-made environment, and the dimension and intensity of changes are controlled not only by natural process but also by the policy and legislation. In this sense, the climatic aspect must be taken into consideration in the process of EIA to mitigate the well-known climatic alterations of urbanization and to improve energy efficiency. The role of EIA in planning and policy processes should be emphasized to reduce adverse influences regarding the ecological, economical and social aspects before any decisions are made in the projects.

Key words: *atmospheric environment, land-use patterns, adverse influence, man-made environment*

DESIGNING SEA TO FIT DECISION-MAKING

Partidario, Maria Rosário
FCT-UNL
Quinta da Torre, 2829-516 Caparica, Portugal
+351 21 2949616 Fax: +351 21 2948554
mp@mail.fct.unl.pt • URL: //campus.fct.unl.pt/mp/

The "one size fits all" has often been argued has not being suitable for SEA! Yet the formal adoption of SEA, particularly where legal implementation takes place, is recurrent in following a standard format for multiple applications.

Possible explanations for this fact may be related to a) the dominant inheritance after environmental impact assessment in relation to planning and policy-making in designing SEA methodological approaches b) the leadership of the environmental administration in the promotion and implementation of SEA with little or no ownership by sectoral decision-making.

The debate often stands between the need to rationalise this tool and make it easy to apply, and perhaps mainly to control, and on the other hand the need for assuring flexibility to suit the "capriciousness and dynamism" of decision-making. Examples multiply around situations where the moment that the information is needed, and can make a difference, has long gone before the same information becomes available! Which may certainly be much more complete and technically robust, but then too late to influence decision! At its best it may achieve minimization of consequences of options that have already been closed.

A brief review of the business literature tackling strategic decision-making show multiple parallels with "la raison d'être" of SEA. The process is there, the context too, it is more a question of substance, of issues that need to be brought into the "decision basket" as equally relevant factors for decision-making.

The proposed presentation will address the experience of designing three different SEA approaches, in quite different contexts (national, sectoral and multi-national) whereby it is conceptually quite feasible yet the paradigm of traditional EIA persists, offering strong resistance to innovation in making impact assessment differently, and perhaps more effectively. The reasons will be brought up for discussion.

Key words: *SEA, strategic impact assessment, decision-making*

SEA FOLLOW-UP—WHICH WAY?

Partidario, Maria Rosário
FCT-UNL
Quinta da Torre, 2829-516 Caparica, Portugal
+351 21 2949616 Fax: +351 21 2948554
mp@mail.fct.unl.pt • URL: //campus.fct.unl.pt/mp/

The notion of follow-up to a decision leads us to think about "what comes after" that decision. Normally we think about projects and the consequence is straightforward: the follow-up is project implementation (at a minimum construction and operation).

But what is implementation in SEA? SEA does not lead to construction, not immediately. In fact, talking about SEA requires an immediate definition of scale is it programme, is it plan, or policy? These are different levels of decision-making that imply different rationale the details are different, the products are different and consequently also the meaning of implementation.

When attempting to address the follow-up to SEA the problem becomes quite complex, at a minimum for two main reasons:

1) the follow-up to SEA does not necessarily mean observing the decision level immediately after, it may be the decision level immediately before, or even the same decision level. In other words, the follow-up to a plan SEA

may be traced in the preparation and implementation of a policy, in another plan or even in an existing situation! 2) The follow-up to SEA must confirm that whatever is being implemented is the same that was approved, or its modification! And sometimes these modifications are hard to follow, not to mention the follow-up in the way we have learned with project's EIA. In the limit, a policy or a plan may be approved but never implemented, and yet that becomes so important to follow-up!

Increasingly SEA approaches are concerned with defining follow-up mechanisms, mostly based on indicators that apply subsequently. How does that information enters back into the decision-making process and how effective these mechanisms can be are amongst the issues that can animate debate around this presentation.

Key words: *SEA, follow-up, decision-making, impact assessment*

AFTER THE PROJECT APPROVAL-HOW TO INVOLVE YOUR COMMUNITY, STAKEHOLDERS AND THE PUBLIC

Murray, Anne
Vancouver International Airport Authority
Box 23750, Richmond, BC V7B 1Y7 Canada
+1 604 276 6357 Fax: +1 604 232 6144
anne_murray@yvr.ca

Robinson, Simon
Vancouver International Airport Authority
+1 604 276 1408 Fax: +1 604 276 6699
simon_robinson@yvr.ca

Formal public consultation is standard practice for almost all large environmental impact assessments. Most environmental impact assessment regulations and guidance material provides detailed descriptions of when and how to inform the public of a project and engage stakeholders in advance of the decision making. Much less attention has been given to involving the public during project implementation and follow-up. This paper recommends that community involvement should not stop when a project is approved rather move to the next phase. The approach and methods used to successfully engage the public during expansion of the Vancouver International Airport is outlined in the paper. Recent expansion of the Vancouver International Airport included construction of a new terminal and a highly controversial new runway. A comprehensive environmental impact assessment was conducted for the project and resulted in a series of mitigation requirements. The Vancouver International Airport Authority developed a comprehensive follow-up program that included ongoing public involvement and consultation. Stakeholder working groups, monitoring committees, public open houses, community mail outs and annual reports have all been utilized as part of the follow-up program. Two key stakeholder committees created for the project are still active today, twelve years after project approval and eight years after completion of construction.

Key words: *community engagement, impact assessment, follow-up, airport expansion*

THE VALUE OF EARLY SOCIAL ASSESSMENT IN MINING

Joyce, Susan
On Common Ground Inc.
234 Jorge Vandergen, Miraflores, Lima -18 Peru
+51 1 441 2300
susanajoyce@shaw.ca

Thomson, Ian
On Common Ground
1050 Pender St. Suite 2170
Vancouver, BC V6P 3S7 Canada
+1 250 335 1060
rockdoc@direct.ca

Social and environmental impact assessment has historically taken place in the mining industry at the point in time when a mining company is able to define a financially feasible project. As few projects actually make it to feasibility studies, and exploration activities can last from a few to 10 or more years, this is late in the process for effectively addressing social issues, especially when trying to support sustainable development goals in which early planning, community capacity building, and avoidance of impacts rather than their mitigation are important tools. The paper will discuss several examples of mining projects in which the absence or weakness of early social assessment led to significant problems being faced by the project proponent or the neighboring communities. Several case studies will also be discussed, briefly, highlighting the way that early social assessment, particularly thorough baseline research and community profiling of social networks, interest groups, and socio-economic power relations, allowed for effective management of social impacts and enhancement of the community benefits deriving from the project. Examples will be drawn principally from developing countries with indigenous as well as poverty issues.

Key words: *early assessment, social, mining, sustainable development*

MONITORING OF THE SOCIAL AND ENVIRONMENTAL IMPACTS OF THE RAGLAN NICKEL MINE PROJECT IN NORTHERN QUEBEC (NUNAVIK), CANADA

Lanari, Robert
Makivik Corporation
1111 Dr Frederik-Philips, Montreal, QC H4M 2X6 Canada
+1 514 745 8880 Fax: +1 514 745 3700
rlanari@makivik.org

Harris-Lowe, Keith
Falconbridge

120, avenue de l'aeroport
Rouyn-Noranda, Quebec J9X 5B7 Canada
+1 819 762-7800 Fax: +1 819 762 9266
KHarris-Lowe@falconbridge.com

Through monitoring, the pertinency and relevancy of impacts and mitigation measures, identified by an EIS at the pre-project phase, can be assessed and evaluated. And , in turn, with a better understanding of impacts associated with development projects, EIS can become more efficient tools in identifying impacts of projects.

Falconbridge's Raglan Nickel Mine Project in Northern Quebec (Nunavik), Canada, has been in operation since 1998. After 5 years of monitoring the impacts on the environment and on the Inuit communities, it is possible to assess the projects impacts and remedial measures as defined in the EIS conducted in the early 90's.

We will see that most of the impacts defined in the EIS were of concerns. However, in practice the intensity and the degree of importance were quite often different and, more important, impacts not identified in the EIS have retained our attention and proper remedial measures have to be identify and implemented.

Key words: *monitoring, Raglan Project*

STRATEGIC ASSESSMENT OF DEEPWATER OIL AND GAS DEVELOPMENT IN NIGERIA

Wolf, C.P.
Social Impact Assessment Centere
423 Broome Street, New York, NY 10013 USA
+1 212 966 2708 Fax: +1 212 219 1963
cpwolf@igc.org

Petterson, John S.
Impact Assessment, Inc.
2166 Avenida de la Playa, Suite F
La Jolla, CA 92037 USA
(800) 494-9918/+1 858 459 0142
Fax: +1 858 459 9461 (fax)
iai@san.rr.com

This paper is submitted in support of the IAIA 2004 conference theme of private sector involvement in the application and advancement of impact assessment.

The concept of "strategic assessment" encompasses two major axes of the field of impact assessment: "comprehensive and integrated" and "proactive and creative." It spans multi- and cross-sectoral concerns among market, government, and civil society interests with a view to the formulation, implementation, and management of development policies and plans, such as privatization and deregulation, and their potential impacts, e.g., on equity and sustainability.

Because of the strategic nature of the petroleum resource, the scope of assessment necessarily extends to a wide consideration of issues and options across the full range of assessment scales, from local to global.

Part of the analytic problem then is to engage and manage this order of social complexity. An analytic framework for industry impact assessment is applied to Nigerian and comparative cases (West Africa, Gulf of Mexico, South Atlantic, and North Sea) to gauge the feasibility and effectiveness of this approach.

The specific objectives of the study are: (1) to estimate the existing conditions of deepwater Nigerian oil and gas development; (2) to project future conditions assuming the continuation of present trends; and (3) to evaluate alternative policies whose implementation might produce "desirable" alternative futures from the standpoint of the parties at interest and risk-local, national, and international.

Correspondingly, the scope of strategic assessment necessarily involves multiple publics, purposes, perspectives, and methods. It represents a further expansion of assessment scale to the proportions of entire industries and countries.

This is an ambitious model. As a strategy for field development in impact assessment, strategic assessment poses both problems of analytic complexity and possibilities for meaningful participation by professional colleagues, including members of IAIA-Nigeria, in anticipating and shaping impact trends and events.

Key words: *strategic assessment, petroleum development, Nigeria*

REGULATION OF OIL AND GAS EXPLORATION AND DEVELOPMENT ON THE EAST COAST OF CANADA: EARLY OBSERVATIONS ON THE CNSOPB BECOMING A FULL-FLEDGED CEAA AGENCY

Collins, Norval
CEF Consultants Ltd.
5443 Rainnie Drive, Halifax, NS B3J 3P1, Canada
+1 902 425 4802 Fax: +1 902 425 4807
ncollins@cefconsultants.ns.ca

Coolen, Michael
Canadian Superior Energy Inc.
Suite 704, Purdy's Wharf Tower 1
1959 Upper Water Street
Halifax, NS, Canada, B3J 3N2 Canada
+1 902 474 3960 Fax: +1 902 474 3958
mcoolen@cansup.com.

The Canada-Nova Scotia Offshore Petroleum Board ("CNSOPB," the "Board") is a joint federal/provincial agency responsible for regulation of petroleum affairs and safe practices offshore Nova Scotia.

In late August of 2003, the Board became an official Federal Authority ("FA") under the Canadian Environmental Assessment Act ("CEAA"). As such, it becomes the lead Responsible Authority ("RA") for the environmental assessment process of most exploration and development projects involving oil and gas off Nova Scotia. Other Federal Authorities include: Fisheries and Oceans Canada (DFO) and Environment Canada. The Environmental Impact Assessment ("EIA") requirements prior to the CNSOPB becoming a FA and after are reviewed and compared in terms of documentation, approval process, timelines and overall efficiency. An additional scoping step has been added to the review process. Overall efficiency of the process is discussed; as is the impact of the scoping step which has the potential to improve focus on Valued Ecosystem Components ("VECs") and pathways, allowing the EIA to concentrate on potential significant impacts, while maintaining a thorough review process. At the same time, more operations fall under the EIA process and Comprehensive Study Reports ("CSRs") may be required for more projects. One positive element is the creation of a public registry that allows tracking of the review process. A downside is a potential increase in the time required in the review process. This paper will review the early observations on the change from the viewpoint of the consulting and oil and gas industries.

Key Words: *oil, gas, offshore, regulation, CEAA, federal authority, EIA process, efficiency, public registry*

TRENDS IN THE ENVIRONMENTAL IMPACT ON THE HEALTH BURDEN IN THE NETHERLANDS: 1980, 2000 AND 2020

Knol, Anne
National Institute for Public
Health and the Environment (RIVM)
P.O. Box 1 Postbak 10
Bilthoven 3720 BA, The Netherlands
+31 302742869 Fax: +31 30 2744451
Anne.Knol@RIVM.nl • www.rivm.nl

Staatsen, Brigit; Ameling, Caroline
National Institute for Public Health and the Environment (RIVM)
+31 302743281

The Centre for Environmental Health Research, part of the National Institute for Public Health and the Environment in the Netherlands, has done research on environment related health burden in the Netherlands over time. This research was done within the framework of the Environmental Balance, a book which is yearly published and describes trends in the Dutch environment and the effectiveness of the policies pursued. For the years 1980, 2000 and 2020, the health impact of several environmental factors has been studied, namely air pollution (PM10 and ozone), radiation (UV and radon), dampness, traffic and noise. For these environmental factors, Disability Adjusted Life Years (DALYs) were calculated. The DALY is the only quantitative indicator of burden of disease that reflects the total amount of healthy life lost, whether from premature mortality or from some degree of disability. Therefore, each health state has been attributed a weight factor (ranging from 0 for completely healthy and 1 for death). Several health states have been investigated, ranging from cardiovascular morbidity or mortality related to PM10 exposure, to sleep disturbance and annoyance caused by noise. At the time of writing, only preliminary results were available. These results indicate that traffic was the biggest cause of environmental related health burden in 1980, but this burden is declining and in 2020, health impact of noise will be the main cause of environmental DALYs. Furthermore, the health burden of ozone is increasing over the years, whereas the health impacts of PM10 and dampness are decreasing. The results of this research can be used by policy makers to reflect on policy measures taken in previous years, and to anticipate on the projected future changes. However, DALY's contain many uncertainties and should only be interpreted as a crude estimation of reality.

Key words: *HIA, environment, DALYs, trends*

WEIGHING THE CONSEQUENCES: ENGAGING BRITISH COLUMBIA COMMUNITIES IN OFFSHORE PETROLEUM ASSESSMENT

Vodden, Kelly M.; Markey, Sean; Pierce, John
Simon Fraser University
Dept. of Geography, Centre for Coastal Studies
8888 University Drive, Burnaby, BC V5A 1S6 Canada
+1 604 862 3512
kmvodden@sfu.ca • www.sfu.ca/coastalstudies

Community impact assessment is a now well-established field from which many lessons can be learned by those about to embark in an assessment process. Considerable experience around the world can also be drawn upon regarding community impacts of offshore petroleum development. ! Despite these information and experiential advantages the question of whether or not to lift a long-established moratorium on offshore oil and gas development in British Columbia, Canada remains highly controversial. Questions of ecological and coastal community impact are at the center of the provincial debate. This paper will review and critique steps taken to date to explore questions of community impact in BC and to involve relevant communities in the process. The story of BC's offshore oil and gas debate demonstrates many lessons of its own. A range of tools has been employed with varying success to engage communities in the debate. Weaknesses in existing offshore petroleum information and information availability have been highlighted, along with the pitfalls of engaging in such a debate without a strategic, participatory approach to information management. Finally, the offshore petroleum debate in BC emphasizes the importance of co! ntext and both the strengths and limitations of comparative analysis.

Key words: *offshore petroleum, community impact assessment, community participation*

ENVIRONMENTAL ASSESSMENT INFORMATION PORTAL FOR SOUTH-WESTERN ALBERTA

Duke, Danah; Sanderson, Ken
Miistakis Institute for the Rockies
c/o Environmental Design
2500 University Dr NW
Calgary Alberta T2N 1N4 Canada
+1 403 220 8968 Fax: +1 403 210 3859
danah@rockies.ca • www.rockies.ca
ken@rockies.ca

Quinn, Michael
Faculty of Environmental Design
2500 University Dr NW
Calgary, AB T2N 1N4 Canada
+1 403 220 7013 Fax: +1 403 210 3859
quinn@ucalgary.ca

Industry, including forestry and the oil and gas sector, agencies and private consultants all require biological and geographica1 information when conducting an environmental assessment (EA). This information is often scattered, difficult to find, resulting in an inefficient process with duplication of efforts. Miistakis has developed an on-line interactive Geographic Information System (GIS) tool to aid in the EA process. This tool links remote biodiversity databases to an on-line GIS environment allowing users to compile species occurrence data with relevant spatial data (i.e., jurisdictional information, transportation networks, hydrology, vegetation).In addition, this tool is linked to a database that houses reference material including past EAs, policy documents, monitoring reports and other related materials. Users are able to define an area of interest onscreen which results in a display of all related materials. This, in combination with species occurrence data effectively assists in the environmental assessment process, allowing fast and easy access to critical information. The system is being developed in close consultation with the provincial, federal and corporate EA community. The pilot portal focuses on the Rocky Mountains with a particular emphasis on the Eastern Front of Alberta. The environmental assessment information portal consists of three key elements: 1) Basic geospatial data 2) Biophysical data 3) EA information sources (primarily grey literature) This tool enhances the EA process by producing information to support decision making, ensuring accessible information on shared biological wealth to expedite the role of individuals and organizations in assessing environmental needs. This tool also reduces costs to the EA process by reducing the time required to access information, identifying monitoring reports thereby reducing redundancy of efforts and encouraging cooperation between environmental assessment practitioners, industry and agencies.

Key words: *environmental assessment, GIS, on-line, information*

THE USE OF COMPARATIVE ECOLOGICAL RISK ASSESSMENT AS AN IMPACT ASSESSMENT TOOL

Johnson, Isabel; Friant, Steve
Golder Associates Inc.
6241 NW 23rd Street, Suite 500
Gainesville, FL 32653 USA
+1 352 336 5600 Fax: +1 352 336 6603
ijohnson@golder. com
sfriant@golder.com

Garcia, Nelson
Bitor America Corporation, PDVSA
5100 Town Center Circle Suite 450
Boca Raton, FL 33486 USA
+1 561 392 0026 Fax: +1 561 392 0490
nelsongarcia@att.net

An ecological risk assessment is the scientifically based, systematic evaluation of potential risks to ecological systems from a human activity. Risk is defined as a combination of the likelihood of an event occurring and the consequences of that event. Ecological risks are further characterized in terms of the exposure of ecological systems or natural resources to a stressor, such as toxic chemicals, and the resulting ecological effects of that stressor on specified species, habitats, or other resources of concern to society. For an ecological risk to exist, two conditions must be satisfied: 1. The stressor must be hazardous, i.e., have the inherent ability to cause adverse effects; and 2. The stressor must contact or be exposed to an ecological component (e.g., a species, biotic community, habitat) for both sufficient intensity and duration to cause an adverse effect. A comparative ecological risk assessment addresses ecological risks from two alternative potential stressors in a side-by-side comparison to evaluate whether the risk from one stressor is greater than, equal to, or lesser than the risk from the other stressor. The initial step, problem formulation, defines the site characteristics and the ecological conceptual model for the study. The second step is the analysis of the two fundamental components of ecological risks: exposure and effects. The third step is risk characterization, in essence the integration of the paired exposure and effects quantifications. The analyses uses paired outputs, allowing the direct comparison of the ecological consequences of two stressors. These outputs, and their synthesis and assessment, are an effective means of visually communicating the results of the ecological risk comparisons to decision-makers, the scientific community, and stakeholders interested in the potential environment impact of human activities. Case studies will be used to illustrate the application of this analysis process.

Key words: *methods, comparative ecological risk assessment*

THE GUIDELINES PROJECT

Wolf, C.P.
Social Impact Assessment Centere
423 Broome Street, New York, NY 10013 USA

+1 212 966 2708 Fax: +1 212 219 1963
cpwolf@igc.org

This paper reviews the past experience, present status, and future prospects of efforts to formulate and implement guidelines for social impact assessment (SIA).

Guideline development is a normal part of the professionalization process in any field of knowledge and practice. It is the codification and promulgation of "lessons learned" from "best practice" in the application of such knowledge representing a consensus of professional judgment among practitioners. As such, it reflects both of the condition of organized knowledge in the field and of the professional community whose members are the bearers of that knowledge.

Efforts to formulate guidelines for SIA have been underway at least since 1972, with the convening of a largely academic consultant group by the Institute for Water Resources (IWR) of the U.S. Army Corps of Engineers. The author of this paper joined the IWR staff the following year, and has continued this work ever since. He viewed professional community building as prerequisite to guideline formulation; IAIA is in part an outgrowth of that strategy.

Beginning in 1990, a concerted effort was mounted in the U.S., specifically in the context of the National Environmental Policy Act (NEPA), to increase SIA legitimacy and efficacy. In May 1994 the Interorganizational Committee on Principles and Guidelines for Social Impact Assessment. Including IAIA representatives, published "Guidelines and Principles for Social Impact Assessment" under the auspices of the National Marine Fisheries Service, U.S. Department of Commerce; it was revised in 2003.

Corporate involvement in SIA guideline formulation commenced shortly thereafter under the leadership of Murray Jones, and continues down to the present in the context of "Integrated Assessment Guidelines." Since 1998 IAIA members under the leadership of Frank Vanclay have undertaken to "internationalize" SIA guidelines; the result of that extended effort is IAIA's May 2003 statement on "Social Impact Assessment: International Principles."

Key words: *social impact assessment, guidelines*

THE CANADIAN CONNECTION

Wolf, C.P.
Social Impact Assessment Centere
423 Broome Street, New York, NY 10013
+1 212 966 2708 Fax: +1 212 219 1963
cpwolf@igc.org

The "connections" series began at IAIA'01 in Cartagena and continued in successive years at the Hague and Marrakech. It consists of three interconnected parts: (1) the impact history of the host country and community, (2) highlighted and, ideally, experienced in impact tours at those scales; and (3) the development and contribution of impact assessment by, in, and about those peoples and places. The idea of "connections" suggests their intersections and interactions.

IAIA and the field of impact assessment in general owe much to Canadian colleagues and institutions for their significant and sustained contributions to advancing the state of the its, science, and craft. Canadian impact assessment has been-and remains-at the forefront of our field. I have offered my appreciation of these achievements on previous occasions-special "Canadian content" issues of my occasional, erstwhile publication, Social Impact Assessment, and citations for IAIA's Rose-Hulman Award (Tom Berger and Gordon Beanlands/Peter Duinker).

On this occasion, it may be recalled that IAIA's founding meeting was held in Toronto in 1981, in conjunction with the annual meeting of the American Association for the Advancement of Science. This year's conference marks the third time IAIA has convened its annual conference in Canada-Montreal in 1989 and Quebec City in 1994 (not counting the 1998 regional conference in Calgary).

Vancouver occupies a special place in the affections of the social impact assessment (SIA) community. The first international meeting of SIA was held down the road in Richmond in 1982, though predated a year by the First Canadian Symposium on SIA held in Kananaskis, Alberta. Vancouver and British Columbia are the site of a various major events in impact history, a number of which (Burchard, Kemano, Revelstoke, Fraser River, Whistler, etc.) are documented, mapped and, again ideally, visited in the Vancouver/BC Impact Tour. Only connect.

Key words: *Canada, impact assessment, IAIA*

THE CANADIAN INDUSTRY PROGRAM FOR ENERGY CONSERVATION (CIPEC): PRESENTATION ON THE DYNAMICS OF A 28-YEAR ENERGY EFFICIENCY PARTNERSHIP

Jago, Philip B.
Industrial Programs Division
Office of Energy Efficiency
Natural Resources Canada
580 Booth Street, 18th Floor
Ottawa, ON K1A 0E4 Canada
+1 613 995 6839 Fax: +1 613 992 3161
pjago@nrcan.gc.ca

Launched in 1975, the Canadian Industry Program for Energy Conservation (CIPEC) has been a key element of the Canadian government's industrial energy efficiency efforts. Under the auspices of Natural Resources Canada, CIPEC provides provides a focal point for a joint industry/government voluntary alliance to increase energy efficiency, limit emissions of energy-related greenhouse gas emissions and increase economic competitiveness. Key program outputs include energy efficiency improvement

targets and action plans to achieve these targets at a sector and sub-sector level. Through a network of 26 sector task forces supported by 45 related vertical trade associations, CIPEC provides Canadian industry with access to services designed to reshape and/or reduce marketplace barriers to the implementation of energy efficiency practices and programs within their respective organizations. This presentation will expand upon the above outline, highlighting how the initiative has adapted to significant energy and environmental policy changes since its inception.

Key words: *industry, energy efficiency, partnership, greenhouse gas, reduction*

STRENGTHENING BIODIVERSITY CONSERVATION THROUGH COMMUNITY ORIENTED DEVELOPMENT PROJECTS: AN ENVIRONMENTAL REVIEW OF THE INDIA ECODEVELOPMENT PROJECT

Rajvanshi, Asha
Wildlife Institute of India
Chandrabani Dehradun
Uttaranchal 248001 India
+91 135 2640990 Fax: +91 135 2640117
ar@wii.gov.in • www.wii.gov.in

The India Ecodevelopment Project supported from Global Environmental Facility funds has been a major conservation initiative of Government of India that was initiated in 1997 in seven Protected Areas in the country. Like most people-centered conservation and development projects, this project also aimed to strengthen biodiversity conservation by establishing critical links between conservation and community well being. The project led to appropriate interventions for improving the management of wildlife habitats and biodiversity values and community based natural resource management to reduce dependence on the Protected Areas. The objective of Environmental Review of the India Ecodevelopment Project was to evaluate inherent risks and negative impacts associated with project supported activities within the Protected Areas or at interfaces with community inhabited areas that could significantly undermine the conservation benefits of such a project. From an environmental standpoint, most project interventions positively influenced the prospects of biodiversity conservation in all the project sites. The project has also contributed significantly in improving the quality of life of communities living in and around the Protected Areas through specific inputs for improvement of agricultural productivity; livelihood opportunities; social and physical infrastructure and viable resource alternatives. Potential impacts associated with some interventions were minor and could be mitigated through simple measures that included involvement of landless beneficiaries in project activities; adoption of consensus driven reciprocal agreements for benefits sharing and encouraging community decisions; development of woodlots and plantations for protection of fuel wood and fodder species and construction of physical structures for soil and water conservation and crop protection. The India Ecodevelopment Project had proven benefits in improving conservation prospects by addressing negative impacts associated with resource use and livelihood practices but has been limited in scope to address biodiversity threats from unplanned development and incompatible landuse around Protected Areas that are far more significant threats.

Key words: *India ecodevelopment project, biodiversity conservation, resource use, livelihood impacts*

BUILDING CAPACITY FOR HEALTH IMPACT ASSESSMENT IN EUROPE

Martuzzi, Marco
World Health Organization
European Centre for Environment and Health
Via F. Crispi 10, 00187 Rome Italy
+39 06 487 7520 Fax: +39 06 487 7599
mam@who.it • www.euro.who.int/healthimpact

The World Health Organization is actively promoting HIA as a resource to raise the profile of health considerations in the decision making process. As one of the means to raise awareness of the potential of HIA, we have been engaged in several activities in capacity building and training. We organized a few training sessions, mostly taking place in countries of the European Region where radical changes are underway (e.g., countries accessing the European Union or moving to market economy). The aim of these courses was to provide a general introduction to HIA, discuss applications in areas of interest for the audience, always with a strong emphasis on practical and participatory aspects.

In designing these courses, we have tended to respond to different needs as they arose from recipients. Such reactive approach has advantages and disadvantages. Addressing participants' needs and providing a contribution towards solving concrete questions is normally very well received; training sessions thus become integral part of specific HIA exercises. Participants, on the other hand, are not all in a position to always tum the training into real work, so the long term benefit, apart from some valuable awareness raising, is unclear.

Discussion is under way as to best design these courses. Demand for HIA training remains high in Europe and it is important to maximize the return of a costly activity such as capacity building when developing plans for the future. A more proactive approach based on a "core" course, to be used regardless of the local circumstances, might be beneficial.

Difficulties in striking the appropriate balance reflect the variety of ways in which HIA can be used to support the decision making process and its loosely defined methodology. However developing more capacity building using recent experience and the many lessons learnt is among WHO's priorities in
HIA.

Key words: *health impact assessment (HIA), capacity building, WHO*

URBAN PLANNING AND CO-EXISTENCE IN SWEDEN OR - WHO CAME FIRST - THE PLANT OR THE VILLAGE?

Larsson, Kerstin; Johansson, Viveca
Enviroplanning Ab
Lilla Bommen 4b S-411 04, Gothenburg Sweden
+4631 771 87 42 Fax: +4631 771 87 41
kerstin.larsson@enviroplanning.se
www.enviroplanning.se

The paper presents the problem with old cities where a once-small rural industry develops and changes its production activity into a potentially more hazardous production. This changing has, in many old cities in Europe, taken place over a long period of 150 years, since the middle of 19th century. At the same time, the residential areas around the factory have grown from simple, small village houses to larger, more heavily-exploited housing areas. The modern urban planning in Sweden of course doesn't allow such co-existence when new areas are planned, but with existing urban areas the problem is there—"who came first"!

The paper presents two examples. The first is a chemical industry, one of Europe's largest, "Akzo Nobel Surface Chemistry," producing chemicals north of Gothenburg. Important application for raising the production with 50% is under trial at the moment. The paper presents how the authorities, stakeholders, the residents as well as the NGOs meets at different arenas before and during the decision making of the production raise is taken.

The other example is a former old industry from about 1850 that over the years has changed into a modern international industry, "Eastman Chemicals," squeezed between housing areas in an old town in eastern Gothenburg. The neighbours' demands to reduce the hazardous production are getting more and more intense, and are often well exposed in media. At the same time, developers also would like to build new houses in the (maybe contradictory) attractive central area. Several impact assessments have been done.

The paper presents how impact assessments with risk analysis are integrated in the decision making process in Sweden and afterward, with international comparisons, an extensive and democratic public participation.

Key words: *sustainability, urban planning, EIA, risk analysis, public participance, decision making, co-existence*

INTEGRATING BUSINESS PROCESS AND BIODIVERSITY CONSERVATION

Kapila, Sachin
Shell International Limited
Shell Centre, London SE1 7NA, United Kingdom
+44 (0)20 7934 5346 Fax: +44 (0)20 7934 7382
sachin.kapila@shell.com • www.shell.com/biodiversity

The Royal/Dutch Shell group of companies (hereafter referred to as Shell or the Group) has identified biodiversity as a one of the key drivers for decision-making. In addition to legal and regulatory incentives, there are strategic, operational, reputational and financial reasons as to why Shell sees biodiversity as integral to the success of its operations. The potential for conflict is very real. Energy is essential for economic development and raising living standards. Long-terms energy scenarios indicate that global primary energy demand by 2050 could be up to three times what it is today, with a large proportion of this coming from the traditional fossil fuels oil and gas. The challenge to society in the coming years will be to ensure continued economic and social development given the increasing global human population, while at the same time maintaining the health and integrity of the world's ecosystems. We also are seeing a huge increase in the numbers of protected areas over the last few decades with over 11% of the earth's surface currently under some sort of protection. There is also a target of having 15% of the marine environment protected by 2015. Can the extraction of coal, oil and gas resources be carried out in such a way as to not negatively impact on biodiversity values, whether it falls under protection or not?

This paper highlights Shell's approach to addressing the issue of biodiversity conservation in order to face this challenge. It focuses on the three key areas that Shell has been working on: playing a role in the public policy debate with regards to protected areas, working to minimise its operational footprint, and making a positive contribution to biodiversity conservation. It presents in some detail the steps the company has taken to address the issue of protected areas and how the company is playing a role in the public policy debate. It highlights key initiatives that the company has been focusing on to integrate biodiversity into decision-making, a corner-stone of which has been the integration of biodiversity into its impact assessment process. And finally, the paper presents some of the many ways in which Shell has been making a positive contribution to biodiversity - through collaborative partnerships with renowned conservation organizations.

IMPACT OF SCHOOL CONSTRUCTION PROJECTS BY CANADIAN NGOS IN NICARAGUA

Connell, Mary Anne
R. R. No. 3, Palmerston,
Ontario, Canada, NOG
+1 519 343 2668 Fax: +1 519 343 2554
connellm@on.aibn.com

This paper presents findings by the author while doing research on the impacts of school construction projects in Nicaragua.

There is a shortage of schools in Nicaragua. Because of this, volunteer organizations build schools there. In recent years

the necessity of education has emerged as an important requirement in the prevention of poverty. A basic education enabling people to read, write and do simple arithmetic is a powerful tool in equipping people to care for themselves and their families. It enables them to get a job, do some entrepreneurial work, figure out the simple things in life, and make better use of indigenous knowledge. The first requirement of education is the desire to attend school, and the second requirement is the presence of a primary school in the community.

First, an analysis of the objectives, methods and processes of Canadian NGOs working in school construction projects in Nicaragua was done.

Secondly, the positive and negative impacts of school construction projects on families and the local community in Nicaragua were identified and analyzed.

Thirdly, the positive and negative impacts of school construction projects by Canadian NGOs on Canadian volunteers were identified and analyzed.

Fourthly, the causes of the positive and negative impacts of school construction projects on families and the local community in Nicaragua with a particular focus on participation were examined and explained.

Lastly, recommendations for action by Canadian NGOs and local communities and families with respect to mitigating negative impacts and reinforcing positive impacts of school construction projects were made and given to the Canadian NGOs.

Key words: *impacts of school construction, development, Canadian NGOs, Nicaragua*

PROGRESSING TOWARD SUSTAINABLE DEVELOPMENT THROUGH REFLEXIVE PROCESSES

Kenny, Brenda
119 Stratton Park SW, Calgary, AB, T3H 2V3 Canada
Bkenny@ucalgary.ca

This paper explores how the changing context of sustainable development and corporate social responsibility is affecting the role of impact assessment as a "way of doing business." Good science in impact assessment is crucial to decision making, and clearly great strides have been made over the past decades. However, the context of sustainable development is evolving, and with that, so is the application of basic principles of sustainable development. This paper provides highlights of these principles both from the vantage point of environmental legislation, as well as corporate strategy. Companies are facing rapid changes in their relationships with stakeholders, in how decisions are made, and in how their "license to operate" is achieved and maintained. This also affects the traditional view of project timelines, in particular when projects "start" and "finish." Increasingly, competitive advantage is being captured by companies that adopt new approaches to business. This is particularly true where those approaches involve open engagement and multi-stakeholder dialogue. Sustainable development business objectives include striving to reach shared understanding and "win-win" solutions with diverse stakeholders, and recognizing the full range of economic, environmental and societal benefits (as well as risks) associated with their business activities. Experience in these areas builds competencies such as active listening, dealing with ambiguity and complexity, and systems thinking, which contribute to competitive advantages in many areas of the business. These multi- stakeholder, "reflexive" processes are discussed. This extends the role of impact assessment from a rather isolated project development perspective into the very fabric of business planning, development and growth activities. The focus moves beyond technical excellence and promotes a holistic interpretation of critical aspects. Challenges in leveraging the benefits of these approaches are discussed.

Key words: *sustainable development, principles, license to operate, stakeholders, corporate strategy, reflexive processes*

REGIONAL GUIDELINES ON EIA IN A TRANSBOUNDARY CONTEXCT CONVENTION

Smith, Liz
European Bank for Reconstruction and Development
One Exchange Square, London, EC2A 2JN
+44 207 338 6504 Fax: +44 207 338 6848
smithe@ebrd.com

In 1991, the United Nations Economic Commission for Europe agreed an international convention on EIA in a transboundary context. In practice, there has not been much practical guidance on how to implement the requirements at the country level, and none at the project level. This has proved problematic in the region of the Caspian Sea, where major off-shore oil projects are undergoing EIA and often have the potential to affect two or more of the littoral states. Some of the countries have ratified the Convention, and have obligations which are binding under international law. The European Bank for Reconstruction and Development has worked on an initiative in the Caspian Region with organisations within the United Nations and representatives of the five countries bordering the Caspian Sea (Russia, Kazakhstan, Turkmenistan, Iran, and Azerbaijan). The initiative involved negotiating and developing practical guidance on transboundary communication in a sensitive region with different cultures, religions, and politics.

THE WATER USE PLANNING PROCESS AT B C HYDRO: BALANCING WATER USAGE IN A SUSTAINABLE WAY

Fields, Daryl
daryl.fields@bchydro.com

Conlin, Kevin
Generation Sustainability
c/o BC Hydro
6911 Southpoint Dr. (E 15)
Burnaby, BC V3N 4X8 Canada
kevin.conlin@bcydro.com

The Water Use Planning Program at BC Hydro was initiated in November 1998. Under the program, twenty-three water use plans were developed for BC Hydro's hydroelectric facilities. The plans will determine how water is to be managed to address the range of water use interests. Plans approved under the Water Act will be written into BC Hydro's water licenses.

BC Hydro's objectives for the program are: to provide greater clarity of operations, in particular greater clarity of regulatory compliance under both the Water Act and the federal Fisheries Act; balance economic, environmental and social values; and build consent to operate.

Key Lessons:

- Broad-based solutions require the participation of all interests, including the regulators. Hence, regulatory frameworks and attitudes may need to be re-shaped
- The importance of consensus is over-rated; the consultative process should focus on aiding decisions rather than dispute resolution
- A well-structured process is critical to collaborative learning, a neutral language for debate, and innovation. That structure must be
- sensitive to the balance of deliberation and analysis
- Joint research breaks down "information hoarding" and positional science and politics
- People don't always know what they want, notwithstanding strong initial positions. The process must help participants construct and
- articulate their personal values and priorities
- Managing today can be easier if one builds in flexibility to respond to inevitable changes in the environmental, social and economic context for
- hydroelectric operations

The Water Use Planning program was initiated as a risk management strategy to secure operational flexibility and consent to operate. The program has not eliminated all pressures on operations but it is setting a strong and positive basis for long term management of BC Hydro's critical fuel supply:
water.

Key words: *hydroelectric,water use, resource planning, sustainability, stakeholder involvement*

A COMPARATIVE ANALYSIS OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESSES OF SELECTED BILATERAL AND MULTILATERAL DONOR AGENCIES (poster)

Gullo, Michael
School For Resource and Environmental Studies
5671 Fenwick Street (Apt.3)
Halifax, NS B3H 1R1 Canada
+1 902 431 7959 Fax +1 902 494 3728
mgullo@dal.ca

Developing countries are largely dependant on foreign aid to improve their economy, environment and more generally, their quality of life. A significant contribution of foreign aid comes from bilateral (i.e., government agencies lending to other government agencies) and multilateral (e.g., regional banks lending to government agencies) agencies. These agencies lend money to developing countries for projects that aim to stimulate and strengthen various economic sectors. For instance, projects can be aimed at strengthening an aspect of the economy or improving a country's energy supply. Often, environmental conditions are attached to the loans that fuel these projects. One example of an environmental condition is the Environmental Impact Assessment (EIA) process. This process is a tool that most bilateral and multilateral agencies use to analyze a project's impact to the environment. The thesis will explore and compare six bilateral and three multilateral EIA processes. The agencies are: Export Development Canada (EDC); Canadian International Development Agency (CIDA); Germany's Ministry of Economic Co-operation and Development (BMZ); Japan International Co-operation Agency (JICA); Norwegian Agency for Development Co-operation (NORAD); Danish International Development Assistance (DANIDA); Asian Development Bank; African Development Bank; and the Inter-American Development Bank. An argument for greater coherence amongst the agency's EIA processes will be made.

Key words: *foreign aid, bilateral and multilateral donor agencies, development*

A QUALITY AND EFFECTIVENESS REVIEW PROTOCOL FOR STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) PRACTICE IN SOUTH AFRICA (poster)

Retief, Francois
School of Planning and Landscape
University of Manchester
Oxford Road, Manchester, M13 9PL UK
+44 0 161 275 6887 Fax: +44 0 161 275 6893
francois.p.retief@stud .man.ac.uk

Jones, Carys; Jay, Stephen
EIA Centre
School of Planning and Landscape
University of Manchester
Oxford Road, Manchester, M13 9PL, UK

+44 0 161 275 6873 Fax: +44 0 161 275 6893
carys.jones@man.ac.uk
stephen.a.jay@man.ac.uk

Sandham, Luke
School of Environmental
Sciences and Development
North West University, Private Bag
X6001, Potchefstroom, 2520, South Africa
+27 0 18 299 1585 Fax: +27 0 18 299 1580
ggflas@puknet.puk.ac.za

Review of quality and effectiveness is an essential component of any environmental assessment system in order to identify best practice and to facilitate continual improvement. In recent years the challenges involved with the review of Strategic Environmental Assessment (SEA) became apparent in the wake of the success achieved with project level assessment review. These challenges arose primarily due to the multiple forms of SEA and the complexity of the different contexts in which they are conducted, that do not allow for a generic list of review criteria to be applied universally. This research presents a context specific SEA review protocol designed to evaluate the quality and effectiveness of plan and programme level SEAs conducted within the South African context. The protocol consists of a review approach, principles and a framework, as well as key performance areas (KPAs) and key performance indicators (KPIs) designed to measure the quality of inputs and effectiveness of outputs. This allows for a holistic interpretation of the cause and effect relationships between inputs and their results. Findings based on the application of the protocol to a specific pilot study suggested that it was methodologically sound and sufficiently robust to warrant wider application within the South African context.

Key words: *review of strategic environmental assessment (SEA) practice in South Africa, SEA in developing country contexts, SEA quality and effectiveness*

PLANNING STRATEGIES: FUTURE SUSTAINABLE INTERACTIONS BETWEEN ENVIRONMENT AND A HYDROELECTRIC PROJECT (poster)

Hernandez-Alvarez, Francisco; Lecanda-Teran, Carlos; Zuniga-Gutierrez, Guillermo
Comision Federal de Electricidad
Rio Mississipi No. 71 - 11o piso
Mexico DF, 06500 Mexico
+52 55 5229 4400 Fax: +52 55 5229 4400
francisco.hernandez@cfe.gob.mx • www.cfe.gob.mx
carlos.lecanda@cfe.gob.mx
guillermo.zuniga@cfe.gob.mx

Rosas-Perez, Irma; Lopez-Olalde, Sofia; Rojas-Garcia, Omar
Universdad Nacional Autonoma
de Mexico. Programa Universitario
de Medio Ambiente
Costado Norte del Conjunto "D" y "E"
de la Facultad de Química Circuito de la
Investigación Científica s/n. Ciudad Universitaria.
Mexico DF, 04510 Mexico
+52 55 5622 5212 Fax: +52 55 5622 5207
puma@servidor.unam.mx • www.unam.mx/puma/
slopez@sid.unam.mx
omarrojas@sid.unam.mx

At present, the Environmental Impact Assessment is a compulsory requirement for developing Hydroelectric projects in Mexico. The basis and guidelines for elaborating it are defined by the Ministry of Environment and Natural Resources. However, the methodology for assessing the interactions between the environment and the projects is not defined. In 2002, the National University of Mexico (UNAM) began to prepare for the National Power Company (Comisión Federal de Electricidad - CFE) the Environmental Impact Statement (EIS) for the Hydroelectric Project "La Parota" at State of Guerrero, Mexico. The impacts expected due to the construction and the operation of the power plant were assessed and the mitigation measures for controlling or preventing them were identified. However, for developing a sustainable project is not enough to implement the mitigation measures therefore CFE and UNAM decided to elaborate a Plan for Regional Development. This plan considers the measures for mitigating the impacts proposed during EIS preparation. Tools from strategic planning are being incorporated to an EIA like SWOT analysis (Strengthens, Weakness, Opportunities and Trends) and multidisciplinary workshops are used to set a strategic objective (main focus for the regional development) and strategic topics (foundation of the proposed model). The strategic planning model used is based upon the classic models developed for non-profit organizations and on the planning system used by Mexican Government (Participative Strategic Planning). The results of the EIA showed that some environmental factors such as the sediment contribution could generate impacts on the dam reducing its operation efficiency. For dealing with this, a plan called "Soil Conservation, Ecological Rehabilitation, and Riverbed Stabilization Strategic Plan for the Upper Valley" is being prepared. This plan incorporates tools like the simulation models for having a forecast about different scenarios.

Key words: *environmental impact assessment (EIA), hydroelectric project, strategic plan, compensation*

HEALTH AND ENVIRONMENT IN POLICY AND PLANNING PROCESSES IN THE NETHERLANDS: THE FIRST STAGES (poster)

Fermont, Anouk
DHV
Laan 1914, no.35
P.O. Box 1076, 3800 BB Amersfoort, The Netherlands
+31 33 4682984 Fax: +31 33 4682801
anouk.fermont@dhv.nl • www.dhv.com

Innanen, Sally
DHV
+31 33 4682589 Fax: +31 33 4683945
sally.innanen@dhv.nl

Kolkman, Dorine
DHV
+31 33 4682714 Fax: +31 33 4682801
dorine.kolkman@dhv.nl

Blom, Edy
DHV
edy.blom@dhv.nl

Health in relation to environment has been a field of interest at the levels of national, regional and municipal government in The Netherlands, one of the world's most densely-populated countries, in recent times. Scientists have been informing the government that if the relevant policy is not changed, the government will be confronted with a wide array of health problems in the public that are invisible at present. The quality of life and living environment is expected to decrease - and in some locations, this is already the case. In the Dutch Action Program Environment and Health (Ministries of Public Health, Physical Planning and Environment, 2002), specific actions have been announced that address key points in the field of health and environment, as well as the strengthening of relevant policy. In June 2003, the European Commission put forth a strategy on environment and health, wherein it also took up the connection between environment and health in its policy. This issue is further emphasised in the Kiev Protocol of 2003 on SEA.

People's health is influenced through the surrounding environment, among other issues. These parameters are addressed in policy and planning; an example would be transport and environmental policy. Very often, however, implicit attention only is paid to health issues. In order to avoid that only implicit attention is paid to health effects in policy and planning processes, more explicit attention must be paid to these issues in the initial stages. At DHV, the first attempts have been made to examine health impacts from environmental issues in a more explicit manner at the level of the neighbourhood and the city, reflecting the nation and the EU's growing interest in this topic area. Health impact assessment is a growing field at DHV and in The Netherlands, but its importance is coming swiftly into recognition. This poster demonstrates the growing importance of this field in The Netherlands.

Key words: *health, environment, quality of life, living environment, action program environment and health, health impacts, health impact assessment*

CORPORATE SOCIAL AND ENVIRONMENTAL RESPONSIBILITY

Mazurkiewicz, Piotr
World Bank
1818 H Street, Washington DC 20433 USA
+1 202 473 8794 +1 202 5222645
pmazurkiewicz@worldbank.org

Di Leva, Charles
World Bank
+1 202 4581745
cdileva@worldbank.org

Traditionally, environmental protection has been considered to be "in the public interest" and external to private life. Governments have assumed principal responsibility for assuring environmental management, and have focused on creating and preserving a safe environment. They have directed the private sector to adopt environmentally sound behavior through regulations, sanctions and occasionally, incentives. When environmental problems have arisen, the public sector has most frequently been responsible for mitigation. In this approach, unrestricted private sector behavior has been considered as presenting the "environmental problem." However, the roles of sectors have been changing, with the private sector becoming active partner in environmental protection. Many governments and businesses are now realizing that environmental protection and economic growth are not always in conflict. Since the Brundtland Report was published, business and management scholars have been grappling with the question of how and why corporations should incorporate environmental concerns into their own strategies. Today many companies have accepted their responsibility to do no harm to the environment. An earlier emphasis on strict governmental regulations has ceded ground to corporate self-regulation and voluntary initiatives. Nowadays, corporate environmental responsibility is defined as the duty to cover the environmental implications of the company's operations, products and facilities; eliminate waste and emissions; maximize the efficiency and productivity of its resources; and minimize practices that might adversely affect the enjoyment of the country's resources by future generations. In the emerging global economy, where the Internet, the news media and the information revolution shine light on business practices around the world, companies are more frequently judged on the basis of their environmental stewardship. Partners in business and consumers want to know what is inside a company. This transparency of business practices means that for many companies, CSR, is no longer a luxury but a requirement.

Key words: *corporate social, environmental responsibility, environmental impact assessment*

DEVELOPING BEST MANAGEMENT PRACTICES FOR BIODIVERSITY CONSERVATION IN THE MINING INDUSTRY

Prairie, Robert

Noranda Inc.
Falconbridge Ltd
2250 boulevard Alfred Nobel, Suite 300
Ville St-Laurent, QC H4S 2C9 Canada
+1 514 745 9357 +1 514 781 9376
Robert.Prairie@Montreal.NorFalc.com
www.noranda.com • www.falconbridge.com

As part of The IUCN/ICMM Mining and Biodiversity Dialogue, launched at the Johannesburg Summit in 2002, , a workshop held in Gland in summer 2003 permitted to develop best practice guidance and reporting criteria in the area of Biodiversity assessment and management . Draft operating principles were developed in three areas (i.e., Integrating Biodiversity into Environemtal Impact Assessment; Integrating Biodiversity into Environmental Management Systems and Community Development programs). Next steps in 2004will be to refine the principles, identify performance criteria and develop guidance on implementation. This presentation will describe in more details some of the key aspects identified by the working group in the integration of Biodiversity into EIAs.

FACILITATING SUSTAINABLE DEVELOPMENT IN DEVELOPING COUNTRIES THROUGH IMPROVING LINKAGES BETWEEN ENVIRONMENTAL ASSESSMENT AND MANAGEMENT TOOLS: A CASE STUDY FROM THE COEGA INDUSTRIAL DEVELOPMENT ZONE AND PORT, SOUTH AFRICA

Lochner, Paul; Munster, Frauke; Heather-Clark, Stuart
CSIR
P.O. Box 320, Stellenbosch, 7599, South Africa
+27 21 888 2400 Fax: +27 21 888 2693
plochner@csir.co.za
fmunster@csir.co.za
SHClark@csir.co.za

The Coega Industrial Development Zone (IDZ) and associated deepwater port in South Africa is a large-scale greenfields development aimed at promoting economic upliftment. Since the initiation of the IDZ and port in the mid-1990s, environmental considerations have been included in the planning and design. These include a Strategic Environmental Assessment and overall Environmental Management Planning for the IDZ and Port, as well as several Environmental Impact Assessments and Environmental Management Plans for specific projects. These environmental assessment and management tools used are generally well established internationally and have been used regularly in South Africa. But how effective have they been at Coega?

This paper presents a review of the effectiveness of these tools in facilitating sustainable development at Coega. The review is based on a series of interviews conducted with key stakeholders from government, business and non-governmental organisations; as well as available documentation. A key finding is that the poor links between environmental assessment and management tools, as well as between these tools and decision-making processes, are key factors limiting the ability of these tools to promote sustainable development. Recommendations are made to improve the links between the outcomes of these tools and decision-making processes; to promote better links between the various tools; and to enhance the communication of findings in a way that is understood and acted upon by all stakeholders. Further recommendations are also made regarding additional tools that could be applied at Coega.

Key words: *effectiveness, environmental assessment and management tools, coega industrial development zone, sustainable development*

THE IMPOTENCE OF CUMULATIVE EFFECTS ASSESSMENT IN CANADA: AILMENTS, AND IDEAS FOR REDEPLOYMENT

Duinker, Peter N.
School for Resource and Environmental Studies, Dalhousie University
1322 Robie St., Halifax, NS B3H 3J5 Canada
+1 902 494 7100 Fax: +1 902 494 3728
peter.duinker@dal.ca

Greig, Lorne A.
ESSA Technologies Ltd.
77 Angelica Ave., Richmond Hill, ON L4S 2C9 Canada
+1 905 770 6334
lgreig@ca.inter.net

Cumulative effects assessment (CEA) is by now an integral component of many environmental impact assessment (EIA) processes. In Canada, CEA is a requirement under the Canadian Environmental Assessment Act. We have followed the conceptual, regulatory and practical development of CEA since the early 1980s. Our experiences lead us to the conclusion at this time that the promise and the practice of CEA are so far apart that continuation of the kinds and qualities of CEA currently undertaken in Canada is doing more damage than good. In this paper, we explain how and why, and propose some redirections for practice that would bring it at least toward the promises. Topics covered include (a) the problem of applying CEA concepts in project EIA; (b) a focus in EIA on project approval; (c) inability to address impact significance and thresholds; (d) the inappropriate separation of cumulative effects from project-specific impacts, (e) weak interpretations of cumulative effects, and (f) trivial attention to future developments. If these problems are not addressed and CEA improved dramatically in the near future, there is little hope that CEA can live up to its potential of serving the cause of sustainable development and ensuring the sustainability of valued ecosystem components. We call for revolutionary change, not evolutionary and marginal improvements.

Key words: *environmental impact assessment, cumulative effects assessment, impotence, improvements*

ENVIRONMENTAL IMPACT ASSESSMENT AND FOREST MANAGEMENT IN CANADA: CURRENT AND FUTURE RELATIONSHIPS

Duinker, Peter N.
School for Resource and Environmental Studies
Dalhousie University
1312 Robie St., Halifax, NS B3H 3J5 Canada
+1 902 494 7100 +1 902 494 3728
peter.duinker@dal.ca

As a process for advising decision-makers of the potential environmental consequences of human undertakings, one would expect the environment impact assessment (EIA) process in Canada to have application to all undertakings that can have significant environmental impacts. The management of renewable natural resources - as in agriculture, forestry, and fisheries - does indeed involve actions that can have large impacts on both biotic and abiotic valued ecosystem components. Take forest management as an example. Activities that can alter forest structure and composition - key components of terrestrial habitat - include timber harvests, site preparation, regeneration, protection from fire, insects, diseases, and competition, and other treatments which have both individual and cumulative effects.

In this paper, I explore how the EIA process is applied in Canada's forest sector. Since the provinces have jurisdiction under the Constitution Act for forests on Crown land, the focus will be on provincial EIA processes. Application of EIA provisions to forest management is rather inconsistent across the country, where some provinces apply the provisions fully and others not at all. Three cases are analyzed to show how forest managers have responded to EIA requirements. I conclude with an examination of the role of EIA in the context of a suite of other mechanisms (e.g., environmental regulation, certification) used in Canada to make sure that forest management is carried out in an environmentally responsible way.

AN EXAMINATION OF MOVEMENT ALONG SCOTLAND'S PATH TO SUSTAINABLE DEVELOPMENT : ENVIRONMENTAL MANAGEMENT SYSTEMS, INDUSTRIAL SYMBIOSIS AND THE LACK OF INCORPORATION OF SUSTAINABLE DEVELOPMENT POLICIES WITHIN GOVERNMENT DEPARTMENTS AND THE ENTERPRISE NETWORK

Lynch, Bill; McAdam, Suzanne
Geddes Institute
School of Town and Regional Planning
University of Dundee
Scotland DD1 4HN UK
+44 0 1382 345237 Fax: +44 0 1382 204234
w.lynch@dundee.ac.uk
s.mcadam@dundee.ac.uk

The newly devolved parliament in Scotland has adopted a prima facia environmental stance with the current First Minister espousing on the world stage, the need for environmental justice at the recent World Summit in Johannesburg alongside the incorporation of policies on sustainable development within the Scottish Parliament's own legislative platform with an outline series of 24 headline indicators (Scottish Executive, 2002).

A pivotal role in promoting and helping to deliver sustainable development in any nation is given to the corporate sector as this is the sector most concerned with resource use and in effect the internalisation of externalities. A number of firms are illustrating this commitment through adopting environmental management systems, either ISO14001, EMAS or indeed the new British Standard BS8555 (www.dti.gov.uk/sustainability).

This paper examines the current state of greenness of the corporate sector in Scotland and its potential to progress the environmental agenda. The study measures the adoption of the various formal environmental management systems (EMS) within the corporate sector and maps the rates of take-up throughout the Scottish Enterprise Network. This take-up is seen as a proxy for greenness within each local enterprise area. The initial results indicate a low take-up and the tentative conclusion suggests there may be a lack of environmental commitment amongst Scotland's companies. However, the existence of EMS are not necessarily a good indicator of environmental commitment. A new proxy has entered the Sustainable Development measurement arena, industrial symbiosis amongst Scottish firms.

The second part of the paper draws upon a recent study which examined the application of symbiotic relationships among a series of 50 projects throughout most of Scotland (excluding Highlands & Islands). These projects were deemed to add to or likely to add to improved resource efficiency and / or provide new products from waste. Mapping these projects by local enterprise company only slightly changes the green hue given by the EMS maps above.

The paper therefore argues that whilst central government departments throughout the UK are failing to incorporate sustainable development policies within their operations (Select Committee, Environment, 2003) that this is also the case with the Scottish Enterprise Network and until such times as this is rectified then a holistic approach to economic development coupled to both environmental and social benefits will mean that sustainable development will remain potentially a 'step too far' for Scotland.

Key words: *environmental management systems, ISO 14001, EMAS, BS8555, industrial symbiosis, sustainable development.*

DEVELOPING BEST PRACTICES OF EIA FOR THE OIL AND GAS SECTOR: THE NEED AND IMPORTANCE OF CLOSER COOPERATION BETWEEN CANADA AND KUWAIT

Al-Abdali, Fatima
Health, Safety and Environment Group
Kuwait Oil Company
P. O. Box 9758, Ahmadi 61008 Kuwait

Al-Yakoob, Sami
Integrated Environmental Solutions
P. O. Box 4098, Safat 13041 Kuwait
syakoob@iestech.net

Sadar, M. Husain
UNEP-McGill EIA Collaboration Center
Faculty of Agricultural and Environmental Sciences
McGill University, Ste Ann de Bellevue
Quebec. H9X 3V9 Canada
husainsadar@rogers.com

It is no secret that the oil and gas sector is one of the key engines for driving the global economy. Consequently, adequate exploitation of current oil and gas reserves and ongoing exploration to discover additional such resources for future use is fundamental for ensuring economic growth to improve quality of life of people around the world.

It is fair to say that the oil and gas industry is fully cognizant of its responsibility to plan and implement all its programs and activities in an environmentally and socially responsible fashion. The industry is highly committed to conduct its business in a fashion which leads to prudent and sustainable use of earth's dwindling natural capital.

The industry is investing considerable financial and human resources to address human health, safety and environmental issues associated with all phases of its operations and exploration. This high level of investment is a good reflection of industry's resolve to conduct its business in a highly responsible manner.

The industry values EIA as a useful tool of integrated planning so essential for natural resource sustainability. Consequently, it is totally committed to meet all EIA related legal and regulatory requirements in the best possible fashion. Obviously, in this technological age and internet economy, the industry as well as governments are very keen to make EIA processes and procedures more focused, efficient and cost-effective

Recognizing that EIA processes, procedures and practices are in the initial stages of development and the accumulated corporate memory so far remains shallow and inadequate, the industry recognizes the need for additional efforts to develop best sector-specific EIA practices.

It is generally recognized that one of the most efficient and economic ways for doing so is mutual exchange of EIA related experiences and expertise with the oil and gas sector in other countries.

The development and efficient operation of oil and gas industry require huge investment of funds, expensive technology and highly skilled work force. The procurement of needed funds, technology and equipment and qualified manpower is a very expensive and time-consuming process. Consequently, a healthy growth of oil and gas sectors in Canada and in Kuwait requires that EIA related requirements should be met in a timely, efficient and above all cost-effective manner. This is essential to get the regulatory approval and to make key decisions for starting the ball rolling.

In this paper, the authors will attempt to provide an overview of the key environmental and social issues raised and dealt with by the Kuwaiti oil and gas sector during the EIA process. A few selected case studies from Canada and Kuwait will be analyzed for highlighting main approaches for predicting environmental and related social impacts and for determining their socio-economic significance.

The paper will also include some specific conclusions and suggestions for expanding and enhancing cooperation between the oil sectors of Canada and Kuwait and perhaps the Gulf Region countries for improving the relevance, efficiency and cost-effectiveness of assessment procedures and practices.

Key words: *EIA best practices, oil and gas sector, sector-specific eEIA, impact prediction methodologies, mitigation, effects monitoring.*

LESSONS LEARNED FROM THE EXPRESS PIPELINE PROJECT: THE PERSPECTIVE FROM THE NATIONAL ENERGY BOARD OF CANADA

Matthews, Lesley
National Energy Board
444 Seventh Avenue SW, Calgary, AB T2P 0X8 Canada
+1 403 299 2796 Fax: +1 403 299 785
lmatthews@neb-one.gc.ca

The Express Pipeline is a 1,256 km crude oil transmission system owned and operated by Terasen Pipelines Inc. (the Project). The Canadian portion of the Express Pipeline, from Hardisty to Wild Horse, Alberta (approximately 435 km), is regulated by the National Energy Board (the Board; the NEB), the Canadian federal agency that regulates the construction and operation of interprovincial and international pipelines according to several pieces of legislation, including the National Energy Board Act (the NEB Act) and the Canadian Environmental Assessment Act (the CEA Act).

As part of the review of the proposed Project, a Joint NEB/CEA Agency Panel convened a public hearing to evaluate predicted environmental effects, mitigation measures and monitoring programs. In their final report (May 1996), the majority of the Joint Panel members set out recommendations for the construction and operation of the Project, should it be approved by the Board. In June 1996, the Board approved the Project, adopting all of the Joint Panel's recommendations as conditions of the Project's construction and operation.

The purpose of this paper is to examine the practical implementation of the conditions pertaining to environmental issues and predicted environmental effects, particularly those relating to monitoring and follow-up. The following questions were considered:

- How effective were the proposed mitigation, monitoring, and follow-up measures?
- How did the performance of these measures in the field compare to the predictions made in the original environmental assessment?
- How can the Board apply these lessons on subsequent projects in the context of improving environmental assessment predictions, improving the selection of mitigation measures, and advancing the design of follow-up and monitoring programs?

IMPLEMENTATION OF THE EUROPEAN SEA DIRECTIVE FOR ENGLISH TRANSPORT PLANS

Fundingsland, Monica L C
School of Planning and Landscape
The University of Manchester
Oxford Road, Manchester M13 9PL UK
+44 0 161 275 6887 Fax: +44 0 161 275 6893
monica.fundingsland@stud.man.ac.uk
www.art.man.ac.uk/PLANNING/

Wood, Christopher
EIA Centre
The University of Manchester
Oxford Road, Manchester M13 9PL UK
+44 0 161 275 6881 Fax: +44 0 161 275 6893
chris.wood@man.ac.uk • www.art.man.ac.uk/EIA/eiac.htm

Tomlinson, Paul
TRL Limited
Old Wokingham Road
Crowthorne, Berkshire, England RG45 6AU UK
+44 0 1344 770800 Fax +44 0 1344 770918
ptomlinson@trl.co.uk • www.trl.co.uk

In England, each Local Highways Authority has a statutory duty to prepare a 5-year local transport plan (LTP) according to the Transport Act 2000. The first full LTPs were submitted to Government 31 July 2000. Prior to the adoption of European Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (referred to as the SEA Directive), LTPs were required to undertake an assessment of the extent to which they performed against the UK Government's five overarching objectives for transport (accessibility, safety, economy, environment and integration).

The environmental appraisal (EA) was thus one of five strands of the appraisal undertaken for English LTPs. The next round of LTPs is due by 31 July 2005, and will require a strategic environmental assessment (SEA) according to Directive 2001/42/EC.

This paper explores the practice of EA for the first round of English LTPs, and compares aspects of existing practice with certain requirements of the SEA Directive. The main focus of the paper is on quality control, monitoring, and integration into decision-making. Aspects of existing practice that have been examined include the extent to which environmental information is provided in EA/LTP documentation, the degree of influence of the EA on plan preparation, the extent and nature of environmental monitoring, and the use of EA/monitoring results and data. The paper also examines local planning authority views on how some of the challenges in melting the SEA Directive's requirements may be addressed.

Key words: *SEA directive, English transport plans, monitoring, quality control, decision-making*

EFFECTIVE SOCIAL IMPACT ASSESSMENT MUST BE INTEGRATED INTO ENVIRONMENTAL IMPACT ASSESSMENT SYSTEM IN THAILAND - LESSONS LEARNED FROM HIN KRUT COAL-FIRED THERMAL POWER PLANT AND BO NOK POWER PLANT

Indhapanya, Chandhana
Center for Graduate Studies
National Institute of Development Administration
Seri-Thai Road Klong Chan, Bueng Kum, Bangkok
10240 Thailand
+66 2 3744280 Fax: +66 2 3744280
chandha@nida.nida.ac.th

Even though environmental impact assessment (EIA) system has been established in Thailand more than 20 years, criticisms have been made frequently concerning ineffectiveness of the system. Some of the major obstacles to the system are the weaknesses in assessing social concerns and neglect of people involvement. These lead to several severe protests and disapproval of the projects. This paper tries to illustrate the shortcomings of the social impact assessment (SIA) and public participation processes especially on legal, institutional, and procedural aspects through the cases of Hin Krut Coal-Fired Thermal Power Plant and Bo Nok Power Plant Projects proposed at the sites of Prachuab Kirikhan province. Recommendations concerning those aspects and how to integrate effective SIA within EIA process will be made accordingly.

Key words: *social impact assessment, environmental impact assessment, Thailand*

CEAA, A CHALLENGE TO CONTINUAL IMPROVEMENT: ONE INDUSTRY'S EXPERIENCE

Wittrup, Mark; White, Glen
Cameco Corporation
2121 - 11th Street West
Saskatoon, SK S7N 4M2 Canada
+1 306 956 6200

CEAA, as it stands today, presents challenges to obtaining environmental approvals and implementing continual improvement projects, especially at the determination and screening levels. These challenges arise from: a structural emphasis within the act and regulations on perceived versus real risk to the environment; a multiplicity of public consultation that fails to find a balance between timeliness, the public's need to know, and the Responsible Authority's legislated public consultation requirements; the wide and often overly precautionary interpretations of the act; and an apparent emphasis on process over substance, especially when projects are low risk or are demonstrably better for the environment than the current situation. As such, CEAA fails to efficiently incorporate the current state of environmental assessment knowledge and regulatory process. It is the experience of Cameco Corporation, a uranium mining and energy company, that CEAA presents significant challenges to continual improvement by failing to recognize that large companies and corporations are highly self-motivated towards sustainable development and the need to maintain our social license to undertake industrial activities. Such companies, working in a highly competitive global environment, require timeliness in EA decisions to participate effectively in that economy. It has been our experience that highly variable interpretations of the act and its regulations, coupled with the fear of litigation, have created a climate whereby the environmental assessment process has become virtually paralysed. The process for a screening under CEAA has, for our industry become relatively inflexible and process focused, more akin to a comprehensive study, consuming valuable time and resources with little apparent value added. The net effect is long approval times for small low-risk projects, or potentially beneficial projects, which are being caught up in a one-size fits all approach to applying CEAA. Even large projects are taking an inordinate amount of time to go through the EA process. CEAA, to be effective, must be managed to provide both adequate and timely assessments, which strike an informed balance between real risk, public consultation and process. If so managed, CEAA could be an efficient tool for promoting, rather than hindering, sustainable development, contributing positively to the viability of industry, while at the same time demonstrating environmental protection. For a screening level assessment under CEAA, we believe that there is an opportunity to apply risk-based principles to the EA process in order to achieve significant improvements to the timeliness of EAs and project approvals. Our paper will discuss how we are meeting the challenges of the current situation, and what we see as the path forward.

SIA AND THE MINING INDUSTRY: EVOLVING EXPECTATIONS

Hamilton, Jim
Golder Associates Ltd.
1000, 940 - 6th Avenue SW
Calgary, AB T2P 3T1 Canada
+1 403 299 5600 (Main) +1 403 260 2272 (Direct)
Fax: +1 403 2995606
Jim_Hamilton@golder.com

Private sector investors who want to develop resource-based projects are required to follow precise permitting procedures determined by the regulators. Government requires that an environmental assessment be conducted which ensures that a defined process is followed so as to predict the environmental and social effects of proposed initiatives before they are implemented. Social impact assessments (SIAs) allow for the identification of possible negative effects as well as formation and selection of project implementation activities that can contribute to sustainable development by introducing measures which ensure negative impacts are avoided or mitigated. When required or appropriate, an environmental monitoring program is designed and implemented to verify that the environmental impact assessment was accurate as well as to determine performance and effectiveness of the mitigation measures. Although follow-up monitoring is an accepted practice in the environmental assessment process, it is at the nascent stages in the private sector. For the International Financial Institutions (The World Bank, Asian Development Bank, African Development Bank, etc.) and bilateral aid agencies (CIDA, USAID, DFID, etc.), project evaluation is a widely accepted and well-defined practice which, when conducted at the mid-term review stage of a project, can provide valuable results-based operational lessons so that adjustment can be made to strategy, structure and methods of implementation if appropriate and/or feasible. This paper will discuss moving beyond SIA follow-up monitoring to incorporate more formalized evaluation techniques which measure project mitigation implementation in terms of their relevance, efficacy, impacts, sustainability and, where appropriate, efficiency. Examples will be drawn from the mining sector.

Key words: *environmental assessment, social impact assessment, follow-up monitoring, evaluation*

THE CANADIAN ENVIRONMENTAL ASSESSMENT ACT REGISTRY INTERNET SITE: PROVIDING FOR MORE MEANINGFUL PUBLIC PARTICIPATION

Mack, James
Canadian Environmental Assessment Agency
160 Elgin Street, 22nd Floor
Ottawa, ON K1A 0H3 Canada
+1 819 953 0179 Fax: +1 819 953 1207
James.Mack@ceaa-acee.gc.ca • www.ceaa-acee.gc.ca

The purpose of this paper will be to discuss the establishment of a new on-line registry for environmental assessments conducted under the Canadian Environmental Assessment Act and the role that this Registry Internet Site is playing in providing for more meaningful public participation in environmental assessments.

During the recent legislative review of the Canadian Environmental Assessment Act, it was determined that one of the main difficulties for the public in participating in environmental assessments was the fact that it was difficult to be notified in a timely manner of what environmental

assessments were being conducted. In addition, even when the public was aware of an environmental assessment, it was sometimes difficult to obtain information early enough during the process to participate effectively.

In response to these difficulties, the Government of Canada proclaimed on October 30, 2003 amendments to the Canadian Environmental Assessment Act that established a new Registry Internet Site. The Registry Internet Site provides for timely notification to the public of when environmental assessments are initiated and includes key records related to the assessment with contacts for how additional information can be obtained.

Departments have started promoting the use of the Registry Internet Site to their stakeholders as a means for monitoring environmental assessments. In particular, the use of on-line maps has made it easier for the public to see what projects are occurring in their region. In the future, there is potential for the Registry Internet Site to be improved so as to further promote public participation in environmental assessments. For example, the Registry Internet Site could be expanded to include on-line consultation mechanisms where the public can post comments on an environmental assessment directly to the Registry Internet Site and then review comments made by other parties.

Key words: *public participation, public registry, information technology (IT) system*

FROM POLICY TO PRACTICE: RECENT DEVELOPMENTS IN THE EVOLUTION OF POLICY ASSESSMENT AT THE FEDERAL LEVEL IN CANADA

Wilburn, Greg
Canadian Environmental Assessment Agency
160 Elgin Street, 22nd Floor
Ottawa, ON K1A 0H3 Canada
+1 819 953 4765 Fax: +1 819 953 8592
Greg.Wilburn@ceaa-acee.gc.ca • www.ceaa-acee.gc.ca

At the federal level, Canada has had a strategic environmental assessment requirement in place since 1990. In 1999, following a critical assessment of federal implementation of the requirement, the federal government put in place new guidance, the 1999 Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals. Since 1999, strategic environmental assessment, as an aid to federal decision making, has markedly improved, both in terms process and practice.

In March 2004, the Canadian federal government hosted the first ever federal workshop on strategic environmental assessment with a view to examining three key questions:

1. What are indicators of good strategic environmental assessment processes at the federal level?
2. What are indicators of good strategic environmental assessment practice at the federal level?
3. What additional work is required to foster the use of strategic environmental assessment by federal organizations?

Workshop participants were engaged in a number of case studies to examine the issue of process and practice, with a view to identifying those factors that characterize good process, and in terms of analysis, those factors that characterize a thorough strategic environmental assessment. This paper/presentation will examine the process used to bring the federal community together to develop workshop content, and provide information on the results of the deliberations during the event. It is expected that the information generated during this session in Canada might have broader applicability among governments and organizations working to incorporate policy assessment into their operations.

Key words: *strategic environmental assessment; policy assessment*

INCORPORATING CLIMATE CHANGE CONSIDERATIONS IN ENVIRONMENTAL ASSESSMENTS

Federal-Provincial-Territorial Committee on Climate Change And Environmental Assessment
Canadian Environmental Assessment Agency
160 Elgin Street, 22nd Floor
Ottawa, ON K1A 0H3 Canada

Scobie Vachon, Al
+1 819 997 2242 Fax: +1819 953 8592
Al.Scobie-Vachon@ceaa-acee.gc.ca
www.ceaa-acee.gc.ca

Climate change has been recognized by all levels of government, and increasingly the public and other stakeholders, as an important environmental issue requiring coherent and effective action. Environmental assessment (EA) has the potential to link project planning to the broader policy development and management of climate change issues. Furthermore, the consideration of climate change is not explicitly identified as a factor to be examined in Canadian EA legislation. Climate change in project EA has been inconsistent. This paper introduces the recently released guidance document entitled, Incorporating Climate Change Considerations in Environmental Assessments: General Guidance for Practitioners, developed by the Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment. Having benefited from an open and collaborative process involving federal, provincial and territorial co-developers, as well as consultations with jurisdictions and stakeholders, this document is a unique and timely initiative with important implications for government decision-makers, project proponents and practitioners. It is a useful resource for the effective incorporation of climate

change considerations in project EA, focusing upon project greenhouse gas emissions and the impact of climate change on projects over time. It is intended to stimulate the consideration of less emission-intensive ways to design and operate projects, while helping proponents manage or reduce the potential risks associated with climate change impacts, and assuring the public and other stakeholders that climate change considerations are being addressed. This presentation will address the development of the guide, its general contents and suggested methodology.

Key words: *climate change; emissions; impacts; guidance; practitioners*

NATURAL GAS PIPELINE ROUTE SELECTION OFFSHORE NOVA SCOTIA AS A MITIGATION STRATEGY

Fudge, Stephen
Jacques Whitford
3 Spectacle Lake Drive, Darmouth, NS B3B 1W8 Canada
+1 902 468 7777 Fax: +1 902 468 9009
sfudge@jacqueswhitford.com

Sayle, Stephen
Jacques Whitford International Inc.
Doha, Qatar
+ 974 478 1768 Fax: + 974 548 6737
ssayle@jacqueswhitford.com

John Auriemma
El Paso Corporation
9 Greenway Plaza, Houston, TX 77046 USA
+1 832 676 7454 Fax : +1 832 676 1191
john.auriemma@elpaso.com

Koski, Michael
Trow Engineering Consultants Inc.
1300 Metropolitan Blvd., Suite 200
Tallahasee, FL 32308 USA
+1 850 385 5441 Fax : +1 902 496 1103
mkoski@trowfl.com

Oram, Terry
Project Consulting Services Inc.
1809 Barrington Street, Suite 810
Halifax, NS B3J 2N7 Canada
+1 902 496 1118 Fax: =1 902 496 1103
toram@projectconsulting.com

Blue Atlantic Transmission System (Blue Atlantic), a subsidiary of El Paso Corporation (El Paso), is proposing to build a natural gas pipeline system known as the Blue Atlantic Project to transport and process gas from future gas developments offshore Nova Scotia, Canada. The Blue Atlantic Project would include construction and operation of: a new subsea gathering pipeline to collect raw gas on the Scotian Shelf and transport it to shore in Nova Scotia for processing; a gas processing plant to be located in Shelburne County, Nova Scotia; and a new subsea transmission pipeline to transport the processed gas across a portion of the North East Continental Shelf to a landfall in the New York /New Jersey area. The Canadian portion of the Project will require an environmental assessment under the Canadian Environmental Assessment Act (CEAA). Any new industrial activities off the coast of Nova Scotia will be of interest to other marine resource users, particularly the fishing industry. Likewise, a gas plant, onshore pipelines, and associated facilities are of prime interest to local residents. One of the first and most important steps in the project planning process was the preliminary selection of a site for the processing facility and a route to the offshore for the subsea pipelines, with due regard for the local public, sensitive species/habitats, geotechnical constraints, and fishing activities. Blue Atlantic personnel met with fishing industry representatives and other stakeholders to solicit input into the onshore site and offshore route selection process. This paper describes the iterative process of project site and route selection, a key part of the environmental impact assessment mitigation through: market analysis and strategy, stakeholder consultation; socioeconomic consideration, resource mapping; constraint identification; GIS database management; geophysical surveys; biological sampling; computer modeling; and multimedia presentation.

Key words: *pipeline route selection, impact mitigation, offshore pipelines, oil and gas industry, fisheries.*

PROMOTING SUSTAINABLE INFRASTRUCTURE DEVELOPMENT IN CANADA: CONSIDERATION OF THE MANAGEMENT OF EFFLUENTS IN MUNICIPAL WASTEWATER PROJECTS FUNDED BY INFRASTRUCTURE CANADA

Fortin, Claude
Municipal Wastewater Effluent
Environment Canada
Floor 18, Place Vincent-Massey
351 St-Joseph Blvd., Gatineau, ON K1A 0H3 Canada
+1 819 997 5416 Fax: +1 819 953 7253
claude.fortin@ec.gc.ca

Grady, Keith
Infrastructure Canada
90 Sparks Street, Suite 606
Ottawa, ON K1P 5B4 Canada
+1 613 954 1372 Fax: +1 613 946 9888
grady.keith@infrastructure.gc.ca

Developed and developing countries, including Canada, face growing pressures to renew and expand public infrastructure, such as transit, water and wastewater treatment, solid waste disposal, buildings and amenities. For infrastructure development to fully contribute to improved quality of life and economic prosperity, it must be based on principles of environmental sustainability.

Infrastructure Canada, a recently created department of the Government of Canada, manages several national programs that deliver billions of dollars in new investment for

sustainable economic growth in urban and rural communities across the country. Municipal wastewater collection and treatment systems are among the eligible project categories under the Canada Strategic Infrastructure Fund and the Municipal Rural Infrastructure Fund administered by Infrastructure Canada.

Based on the outcome of risk assessments conducted under the Canadian Environmental Protection Act, 1999, the Government of Canada intends to more actively promote the management of municipal wastewater effluents, based on pollution prevention planning and national standards managed through harmonized regulatory regimes. The Canadian Council of Ministers of the Environment is currently considering the development of a Canada-wide strategy and measures to ensure that municipal wastewater effluents do not pose unacceptable risks to citizens and the environment. The paper reports on these developments and proposes an approach for assessing municipal wastewater project to ensure that proposals receiving federal support are properly aligned with the Government's environmental sustainability objectives for this sector.

Key words: *infrastructure, municipal wastewater, environmental sustainability, Government of Canada, Infrastructure Canada, Canadian Council of Ministers of the Environment*

CHALLENGES IN THE USE OF TRADITIONAL KNOWLEDGE IN EIA

O'Neil, Chris
AMEC Earth and Environmental
Suite 6, 5102-50th Ave
P.O. Box 2245, Yellowknife, NT X1A 2P7 Canada
+1 867 920 4140 Fax: +1 867 920 4402
chris.oneil@amec.com • www.amec.com

Ehrlich, Alan
International Association for Impact Assessment
Western and Northern Canada Affiliate
P.O. Box 1212, Yellowknife, NT Canada
+1 867 444 5153
aehrlich@mveirb.nt.ca • www.iaia-wnc.ca/

Traditional Knowledge (TK) is commonly used to refer to a system of knowledge, values and beliefs passed across generations. An increasing number of formal mechanisms require or promote the consideration of TK in Environmental Impact Assessment (EIA) in Canada, and this has been reflected in the assessment of several major proposed projects.

The inclusion of TK in EIA poses several challenges to those compiling EIA documents, as well as to bodies conducting the EIA review. This paper describes how TK can be integrated into various stages of EIA, and explores some of these challenges to doing so, based on the first hand experiences of the authors.

- Because TK is area specific, TK holders are often from potentially affected communities with an interest in the outcome of the EIA. This raises questions of bias, particularly where there will later be financial compensation related to impacts.
- There are important differences in between community based knowledge and TK. These affect the way each is considered in EIA. Separating these two related forms of knowledge so that they can be best applied is a challenging task.
- Although many TK holders are elders, not all elders are TK holders, and not all TK holders are elders. Just as the credentials of scientific authorities are examined in the hearing, so should the credibility to TK holders.
- TK testimony and evidence in EIAs can conflict with other TK evidence. In such a situation, it is difficult to weigh evidence adequately.

Key words: *Traditional Knowledge, aboriginal, First Nations*

CREATING MORE ADVANCED ENVIRONMENTAL GUIDELINE OF THE JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Harashina, Sachihiko
Tokyo Institute of Technology
4259 Nagatsuta, Midori-ku,
Yokohama 226-8502 Japan
+81 45 924 5550 Fax : +81 45 924 5551
sahara@depe.titech.ac.jp

The Japan International Cooperation Agency (JICA) is the major organization for Official Development Assistance (ODA) in Japan. It has three functions of assisting the planning process of big projects, making gifts for projects, and technology transfer to developing countries. It has a big role for assisting studies for planning big projects supported by official loans of Japanese government. It, therefore, is required to make enough considerations to environmental and social impacts caused by its activities. JICA has already a series of guidelines for this purpose which were made in the early part of 1990s. By strong requirement from the Japanese Diet for revolution of the Ministry of Foreign Affairs, JICA started to revise the environmental guidelines. The new guideline is overall one. And it is fairy high level for sustainable development by requiring good practice of EIA. For instances, it requires three time public consultation though the world bank requiring two times, very positive information disclosure, and introduction of Strategic Environmental Assessment. It will be established in April 2004 and implemented at the same time. The author, as the chairman of the committee, analyses the characteristics of the guideline and the reason why such advanced one was made. The process of creating it was a very transparent. Every major stakeholders were collected into the study committee including not only academics but also the representatives from major ODA related governmental bodies, NGOs, and consultants. Every meeting was open to the public and minutes of the meetings were appeared on

the web site. Various opinions were always collected and put into the committee. After the committee report was made, JICA made the draft of the guideline. It held also several public consultation forums, then. Public comments were collected. The very transparent process made it possible to achieve a high level guideline.

Key words: *EIA, environmental guideline, sustainable development, public involvement, JICA, ODA*

STRATEGIC ENVIRONMENTAL ASSESSMENT APPROACH FOR CONSENSUS BUILDING OF REGIONAL WASTE MANAGEMENT - A CASE STUDY IN NAGANO PREFECTURE, JAPAN

Harashina, Sachihiko
Tokyo Institute of Technology
4259 Nagatsuta, Midori-ku,
Yokohama 226-8502 Japan
+81 45 924 5550 Fax : +81 45 924 5551
sahara@depe.titech.ac.jp

Waste management is one of the major topics for creating sustainable society. There are many disputes of construction of waste treatment plat in all over the world. Those are one of NIMBY problems. The public involvement process has not been good in Japan because of the insufficient democratic system. But this situation has been changing recently. This is a case happened in Nagano Prefecture in the central part of Honshu Island, the biggest Island in Japan. The prefecture is located in a very mountainous region with natural beauty. The prefectural government planned to construct a combination of a waste treatment plant and a landfill site in a small town for the waste management of the region. Though it conducted project EIA, the local residents claimed that the site location process was not transparent. A big dispute arose. The new governor was elected in the autumn of 2000, and he heard the voices of the people. As he realized that true public involvement process was necessary, he asked the author to resolve the dispute. The approach of consensus building for this was a kind of an application of the concept of strategic environmental assessment. The dispute was arisen at the final stage of the series of decision making from policy making to project implementation. For public involvement, public should be involved from the start of policy making stage. The author has a theory of good public involvement. It has three requirements of configuration of the consensus building arena, high level openness of the arena, and supply of sufficient information necessary to solve the problem. It was realized in the case. They could build step-wise consensus until finding 85 candidate sites for location. Though the dispute is still continuing, they are making steady steps towards the final settlement.

Key words: *strategic environmental assessment, waste management, consensus building, public involvement, Nagano Prefecture*

USING LIFE-CYCLE IMPACT ASSESSMENT TO ASSESS ENVIRONMENTAL PERFORMANCE IN THE ELECTRICITY SECTOR: CASE STUDIES IN CANADA AND THE US

Rhodes, Stanley P.
Scientific Certification Systems
2000 Powell St., Suite 1350, Emeryville, CA 94608 USA
+ 510 452 8000 Fax : + 510 452 8001
srhodes@scscertified.com • www.scscertified.com

In response to concerns about the environmental impacts associated with the electricity sector, a number of initiatives have emerged to promote "green" power. However, while there is a general consensus regarding the need to reduce the environmental footprint of electricity, there is by no means a consensus on the best approach toward achieving this goal, or even on the definition of what is "green." A variety of green power definitions and initiatives have been put forward, often reflecting conflicting perspectives and criteria

To settle the question of what is "green," energy companies, policymakers and customers need a consistent, scientific tool to analyze the relative environmental impacts of various power generation technologies, efficiency upgrades, transmission options, and conservation strategies. Such a tool is needed to compare the relative merits and disadvantages of options on a transparent, systemwide basis and to determine which options represent the lowest environmental impacts, offer the greatest reliability, and represent the best use of economic resources.

Life-cycle impact assessment (LCIA), standardized internationally (ISO-14042), satisfies this need. LCIA is, a system-based data integration and analysis approach that takes into consideration the type of fuel source utilized, and the environmental, technological, and operational variables that influence the nature and scale of environmental impacts.

Scientific Certification Systems has conducted several LCIA studies in the US and Canada, assessing a wide range of electricity generation systems. These studies have shed light on some of the most controversial subjects in the green power arena. Several case studies will be discussed. In addition, SCS has established the first technical standard for certifying environmentally preferable power based on the ISO-14042 standard. This standard is technology-neutral, transparent, and addresses the full spectrum of relevant environmental impacts. It can also be used to support impartial evaluation of existing green power programs in Canada and the US.

Key words: *life-cycle assessment, Life-Cycle Impact Assessment, LCA, ISO-14042, environmentally preferable power, green power, EPP, certification, low impact power*

CIPEC: TOOLS FOR IMPACT ASSESSMENT

Jago, Philip B.
Industrial Programs Division
Office of Energy Efficiency
Natural Resources Canada

Launched in 1975, the Canadian Industry Program for Energy Conservation (CIPEC) has been a key element of the Canadian government's industrial energy efficiency efforts. Under the auspices of Natural Resources Canada, CIPEC provides provides a focal point for a joint industry/government voluntary alliance to increase energy efficiency, limit emissions of energy-related greenhouse gas emissions and increase economic competitiveness. Key program outputs include energy efficiency improvement targets and action plans to achieve these targets at a sector and sub-sector level. Through a network of 26 sector task forces supported by 45 related vertical trade associations, CIPEC provides Canadian industry with access to services designed to reshape and/or reduce marketplace barriers to the implementation of energy efficiency practices and programs within their respective organizations.

CLIMATE CHANGE IMPACTS ON ELECTRIC AND NATURAL GAS UTILITY ASSET OPERATIONS AND COSTS

Davis, Todd D.; Altalo, Mary G.
Energy Solutions Group
Science Applications International Corporation (SAIC)

This paper will demonstrate the practical value of applying climate science and modeling to electric and natural gas utility load and energy forecasting, and then applied to utility asset planning over a long term. The study is based on an earlier completed san diego regional energy infrastructure study, which was completed in january 2003. The study reports on the completion of a long-term climate forecast and identifies the seasonal temperatures and precipitation variations for a 30-year period. Then, the seasonal temperature changes are applied to electricity and natural gas energy forecasting and infrastructure planning.

The study found that seasonal climate change represents anywhere from 1oC-1.5 oC impact on the winter or summer load forecasts for electric and gas utilities. The increasing temperatures will have variable impacts on electric and natural gas infrastructure for San Diego County. The changes are likely to have a more gradual long-term impact affecting the infrastructure investment level and asset base in San Diego County as well as in the average yearly-monthly-daily operations of the energy assets. The historical analysis found significant near term annual behavioral impacts on electricity consumption due to price, behavior and weather. The regression models that were constructed controlled for price, customer education and other factors. Climate-induced temperature change was found to lower winter gas heating requirements and increase summer electric load requirements - more so for the residential market than commercial market. The impact of temperature increases took into account pricing, market growth, efficiency and other market responses. Weather demand impacts range form just a few MW for the commercial market to over 300 MW variations for the residential market. Additional impacts on both average annual seasonal demand for natural gas for the residential and commercial markets as well as for the maximum peak sendout for natural gas. The regression models developed were statistically significant.

A final major finding of the project was the incidence of extreme weather conditions in Southern California are expected to increase which will make peak day planning extremely important for both reliability and cost savings.

ECONOMIC IMPACTS OF IMPROVED HOURLY TEMPERATURE FORECASTS FOR ELECTRICITY GENERATORS

Greening, Lorna A.
Lorna A. Greening
Los Alamos, NM 87544 USA
+1 505 672 9594
LGDoone@aol.com

Gaushell, Dennis
Consulting for Energy
Sunnyvale, CA 94087-4144 USA
+1 408 605 6298
dgaushell@stanfordalumni.org

Davis, Todd
Science Applications
International Corporation
8301 Greensboro Dr., McLean, VA 22102 USA
+1 610 213 4251
todd.d.davis@SAIC.com

Localized or mesoscale weather conditions can have major effects on the accuracy of hourly load forecasts of electricity usage. These localized conditions can include "sea-breezes," local valley or mountain breezes, lake breezes, or in some cases "urban heat islands." Such weather conditions can give rise to transient localized decreases in temperature, humidity, and wind speed. As a result, electricity forecasts utilizing regional weather forecasts based on synoptic conditions such as high-level wind flows and regional atmospheric pressure conditions will be in error. Some of these errors may be small on a daily basis, but when viewed cumulatively over a year, can result in a substantial economic loss to electricity generation firms. Other errors resulting from weather extremes produce even greater load forecasting error. Economic losses can result from the need to purchase higher marginal cost supplies, or even result in rolling blackouts to cover shortages in extreme situations.

In a case study on the central valley of California, we estimate the economic impacts of improved localized weather characterization on electricity load forecasts. The Central Valley is subject to several different weather regimes

characterized by differences in wind speed, temperature, and sea level pressure on any given day. At least one of these weather regimes results from a highly unpredictable "sea breeze" subject to topography and synoptic conditions. To illustrate the consequences of a miss-forecast of temperature in this regime, this particular phenomenon has resulted in a $1 million loss from generation shortfalls that had to be covered in the market. This picture is further complicated by interactions between this regime and other weather regimes in the Central Valley.

Using an econometric load model we evaluate the effects of these different weather regimes in a spatial context. Our analysis indicates that improvements in hourly temperature forecasts, and better characterization of localized weather regimes will lead to a decrease in errors in electricity forecasts for the area. We estimate the potential economic gains from improved forecasts, and suggest that substantial benefits can be gained through improving the accuracy of hourly temperature forecasts, and a better representation of local weather in a load-forecasting framework.

LEVERAGING THE INFORMATION IN ENSEMBLE WEATHER FORECASTS FOR MORE RELIABLE RENEWABLE ENERGY GENERATION

Smith, L.A.; Broecker, J, Kilminster, D.; Clarke, L.
Center for the Analysis of Time Series
Department of Statistics, London School of Economics
Center for the Analysis of Time Series
Department of Statistics
London School of Economics
Houghton Street, London WC2A 2AE UK
www.lse.ac.uk/collections/cats

The reliable allocation of future generation from many sources of renewable energy is currently hindered by the weather dependence of those sources. Wind energy is a prime example where dependence on either climatology or traditional single "best guess" weather forecasts may introduce unexceptable variations between expected (allocated) generation and that delivered. The requirement of maintaining warm reserve (or even spinning reserve) using traditional power plants can significantly impact the goals which originally motivated the move towards renewable supply.

Operational ensemble weather forecasts have been available from both the National Centers for Environmental Prediction (NCEP) and from the European Center for Medium Range Weather Forecasting (ECMWF) for over a decade now. In this contribution, we will investigate different strategies for extracting the information in these ensemble forecasts and using it in the context of wind energy generation.

Following Roulston et al (M. S. Roulston, D. T. Kaplan, J. Hardenberg & L. A. Smith (2003) Renewable Energy, 28 (2003), 585-602) we contrast the result of planning forward generation based on a variety of operationally available forecasts, ranging from climatology to the full ensemble forecast, in the context of a simplified electricity market. At lead times up to 6 days, production decisions are improved by using forecasts based on the ECMWF ensembles. Applications to other types of plant and to demand forecasting more generally will be noted.

CLIMATE FORECASTS FOR THE ENERGY INDUSTRY: MOVING BEYOND WEATHER

Pierce, David; Alfaro, Eric; Barnett, Tim; Gershunov, Alexander; Steinemann, Anne
Climate Research Division, Scripps Institution of Oceanography

The energy industry typically uses weather forecasts to plan operations a few hours to a few days ahead. However, many slower evolving climate phenomenon also have impacts on the energy industry, on timescales from seasons to decades. This presentation will show examples of what climate forecasts are available that can be used by the energy industry, what lead-times and skill they have, and how they are relevant to planning and operational decisions.

The examples will include a characterization of the climate influences on and predictability of the California delta breeze, a cool on-shore wind that sometimes ventilates the California central valley, dropping electrical load by up to 500 MW; an analysis of the predictability of irrigation pump loads in the U.S. Northwest, and the extent to which they are influenced by the previous winter's snow accumulation and spring rainfall; and the prediction of winter seasonal temperature (heating degree days) in Southern California, which is useful for planning natural gas operations.

THE IMPACT ENHANCED WEATHER DATA AND ASSESSMENT ON THE RISK PROFILE OF THE ENERGY INDUSTRY

Hale, Monica; Altalo, Mary G.
Energy Solutions Group, Science Applications International Corporation (SAIC)

Identifying adverse operational impacts and the controlling of manageable risk is a primary concern of all businesses. The energy sector was one of the first industries to recognize the risks it was exposed to as a result of weather variability, and was largely instrumental in developing 'weather derivatives' as a financial product to mitigate its risks. However, as has recently been demonstrated, enhancing the skill of weather forecasts and reducing load forecast model error, for example, may also result in considerable reductions in risk exposure. Case study investigations undertaken in power generators, distributors, independent system operators and large power users have revealed substantial potential for increasing the accuracy of power demand forecasts and enhancing the efficiency of a number of power sector operations leading to risk reductions.

A number of investigations have recently been undertaken in the United States focusing on the power sector and the use the industry makes of environmental information, in particular weather data. Case studies have examined the characteristics of environmental data inputs such as sources of weather data, resolution, reliability/error values, parameters [temperature, precipitation, humidity], temporal scales, models, and the use of weather data in improving overall performance of the energy sector. Associated with a reduction of risk to the industry, other benefits accrue such as enhanced regional economic performance and competitiveness, energy security, sustainability and corporate responsibility.

The presentation will briefly examine the improvements in the risk profile of energy sector organizations, the impacts of enhanced weather forecast data and better assimilation of the information in energy sector that lead to the better management of risk, with consequential lowering of risk ratings.

MAINSTREAMING ENVIRONMENTAL FORECAST INFORMATION INTO MANAGEMENT DECISION TOOLS IN THE POWER INDUSTRY

Altalo, Mary G.; Hale, Monica
Energy Solutions Group, Science Applications International Corporation
McLean Virginia

As the skill of environmental forecast products resulting from enhanced observational technology, modeling and analytical capability improves, so too must the uptake and optimal assimilation of the information into the business tools, practices and policies of the energy industry. Analysis of the decision processes in the power value chain leads to the identification of key areas where environmental forecast information can significantly improve the efficiency, reliability, and cost effectiveness of "vulnerable" business operations such as load forecasting, generation commitment, revenue projections, power pricing, supply chain management, tariff scheduling, asset planning and so forth. New software tools and management strategies can be employed to maximize the impact of the environmental forecast information for a "favorable outcome" of the decision process. Case studies roadmap how environmental forecasts can improve the business forecasts used to inform policy, regional management strategies, market tools and financial planning. From a decision science point of view, organizations can become responsive to managing with environmental information to improve competitive advantage and safety.

EIA FOR CANADA'S LARGEST GREENFIELD WATER FILTRATION PLANT

Ferguson, Mark
Greater Vancouver Regional District

The Greater Vancouver Regional District supplies water to the 2 million residents of the western half of British Columbia's Lower Mainland, which is situated on the west coast of Canada. A number of water quality concerns have led towards the requirement to construct new water filtration plants for two of its sources. The combined capacity of the two plants is 1800 ML/d and will make it the largest water filtration plant in Canada when completed in 2007. The C$600 Million project includes a combined filtration plant, an 1800 hp pumping station, a 2MW energy recovery facility and twin 7 km long tunnels.

Environmental Impact Assessments (EIAs) that included extensive efforts and evaluation of options for siting of the two plants were carried out over a ten-year period. A triple bottom line approach which included social, environmental and economic factors was utilized when considering siting options and technologies for the treatment plants.

The presentation will present the options considered and studies completed on archeological, aquatic and terrestrial environmental impacts, neighbourhood and community impacts, worker safety, as well as, technological and cost issues associated with constructing such a large project.

The GVRD utilized extensive stakeholder involvement during project development which resulted in the host municipality supporting the need for and construction of the project in their backyard. The consultation process, lessons learned and how stakeholder input was used in the "triple bottom line" approach will be presented and discussed.

The outcome of the EIA and final recommendation was a combined filtration plant located in a natural park like area known as the Lower Seymour Conservation Reserve. The mitigation strategies adopted, the environmental and social challenges associated with constructing the plant in the selected location will also be presented.

Key words: *EIA, large infrastructure, stakeholder contultation*

A COMPARATIVE ANALYSIS OF ENVIRONMENTAL IMPACT ASSESSMENT COAL BED METHANE (CBM) AND STEAM ASSISTED GRAVITY DRAINAGE (SAGD)

Smyth, Clint
EBA Engineering Consultants Limited.

A literature search was conducted to compare and contrast environmental impacts associated with the established environmental impact review process for SAGD projects in northeastern Alberta with emerging development of coal bed methane (CBM) plays in western Canada. The review included an evaluation of activities in the United States and western Canada. Although there are similarities in environmental impacts associated with these oil and gas developments, there are important differences that must be acknowledged in the review process.

Key words: *EIA, large infrastructure, stakeholder consultation*

WHY STANDARDIZED RISK ASSESSMENT GUIDANCE WITHIN A HEALTH IMPACT ASSESSMENT IS ESSENTIAL TO EFFECTIVE ENVIRONMENTAL STEWARDSHIP OF FEDERAL CONTAMINATED SITES IN CANADA

Richardson, G. Mark; David, Jacinthe
Environmental Health Assessment Services
Health Canada
Ottawa, ON K1A 0K9 Canada

Petrovic, Sanya
Health Canada
BC/Yukon Region
Vancouver, BC Canada

Human health risk assessment is a valuable tool within the Health Impact Assessment toolkit. However, risk assessment, whether at the screening level or more complex, is not an exact science. A wide variety of advice and direction is offered by international, national and provincial environmental agencies regarding the conduct of risk assessment. Environmental regulatory agencies across Canada, and those abroad, offer differing guidance on many aspects of risk assessment as well as specifying different levels of risk that are defined as essentially negligible, tolerable or acceptable. Individual risk assessors, often within the same consulting firm, access and rely on the available regulatory advice and direction differently. The resulting variability prevents the effective comparison of risk assessment results from one site to another, complicating the task of identifying and remediating the highest risk sites first. We will review the available evidence on risk assessment variability, including studies conducted specifically for Health Canada, and demonstrate why Health Canada has formalized standard risk assessment procedures for the assessment of federal contaminated sites in Canada.

GETTING IT RIGHT FIRST TIME: THE SKORPION ZINC PROJECT

Walmsley, Bryony
Southern African Institute for Environmental Assessment

Kilbourn Louw, Michele
Independent consultant

The Skorpion Zinc Project was a green fields development of an open cast zinc mine and refinery in a remote, pristine desert in southern Namibia. The area lies in one of the top 25 global biodiversity hotspots and is the only desert on the list. It also lies in an area that has been recommended for development as a National Park. It was therefore imperative that environmental management at the site should be taken extremely seriously.

Fortunately this was recognised early on when exploration started in 1997, and environmental consultants were appointed to compile an Environmental Management Plan (EMP) for the drilling programme. When the deposit had been confirmed, the consultants completed a comprehensive EIA to World Bank standards, which was backed up with a detailed EMP for construction. The site environmental control officer was one of the first permanent appointments made, and it was her task to ensure that the 4500 construction workforce employees and the dozens of contractors, not to mention the owners and managers of the project, complied with the 160 clauses contained in the EMP. By the end of construction some 2 years later, independent compliance audits found that over 90% of the EMP clauses had been fully complied with and there were no inadequacies recorded. This was achieved through the combination of a number things:

- Full commitment and support from senior management;
- The early adoption of the motto "Get it right first time, every time";
- The development of Environmental Design Criteria that were used by the design engineers as a reference, thereby eliminating many impacts at source;
- The inclusion of the EMP and Code of Conduct in all tender documents;

The culture of care that was instilled in the workforce seemed to carry through to other aspects such as Health and Safety, with the site at one time achieving over 4 million lost time injury-free manhours and no fatalities. This would be remarkable on any construction site, but in such a remote area in such extreme conditions, this was considered to be exceptional.

Getting it right (mostly) first time certainly paid off when the project was awarded the National Premium Award for Excellence in Environmental Management by the South African Chapter of IAIA in September 2003.

ENVIRONMENTAL ASSESSMENT SYSTEM FOR HOUSING COMPLEX DEVELOPMENT IN KOREA (poster)

Lee, Young Soo
Korea Environment Institute
613-2 Bulgwang-Dong, Eunpyeong-Gu
Seoul, Seoul, 122-706 Korea
+82 2 380 7657 Fax: +82 2 380 7744
leeys@kei.re.kr • http://www.kei.re.kr

Park, Young Min
Korea Environment Institute
+82 2 380 7676 Fax: +82 2 380 7744
ympark@kei.re.kr

Park, Chang Suk
Korea Environment Institute
+82 2 380 7771 Fax: +82 2 380 7744
plade290@kei.re.kr

Kim, Wan Soo
Korea Land Corporation
217 Jung Ja-Dong, Bundang-Gu
Seong Nam, Gyeonggi, 463-755 Korea
+82 31 738 7544 Fax: +82 31 738 8868
kwsoo@iklc.co.kr • http://www.iklc.co.kr

Kang, Jae Wook
Korea Land Corporation
+82 31 738 7548 Fax: +82 31 738 8868
jwkang@iklc.co.kr • http://www.iklc.co.kr

Park, Jong Chun
Korea Land Corporation
+82 31 738 7386 Fax: +82 31 738 8868
0490park@hanmail.net • http://www.iklc.co.kr

There is EA(environmental assessment) system to achieve ESSD(Environmentally Sound and Sustainable Developement) in Korea. One is PERS(Preliminary Environmental Review System), and the other is EIA(Environmental Impact Aeeseement). The purpose of each system is different. Whereas the purpose of PERS is to decide that the site for project and development plan are appropriate with respect to environment, the main goal of EIA is to reduce adverse impacts resulted from execution of development project. In Korea, many EA for housing complex development has been carried out, and several projects were rejected. Thus, we'd like to introduce methodology for EA for housing complex development. At PERS stage, Geology, flora and fauna, hydrology, land use, air quality, water quality, soil, noise and vibration must be assessed. For example, with respect to geology and hydrology, possibility of occurrence of natural disater like slide and frequent inundation at project site will be examined. When it is expected that natural diaster will happen, the site is not suitable. From the viewpoint of air quality, whether ambient air quality and future air quality(ambient concentration + additional concentration) exceed NAQS(National Air Quality Standards) must be examined. When, ambient air quality exceeds NAQS, the site is not suitable for housing complex development. On the contrary, at EIA stage, meteorology, waste management, landscape and visual impact, transporation, and so on will be added. For example, with respect to meteorology, we recommend that layout of apartment dose not hinder the flow of wind stream. Furthermore, if the project will be built near seashore, the impact on ecology of seashore and ocean must be considered. To save time and cost, impacts assessed at PERS stage do not assess at EIA stage.

Key words: *EA for housing complex development in Korea, PERS, EIA*

HEALTH AND SUSTAINABILITY: EXAMINING THE POWER OF HEALTH IMPACT ASSESSMENTS WITHIN ENVIRONMENTAL IMPACT STATEMENTS (poster)

Higgins, Kathryn E.
Health Impact Assessment Development
Texas Program for Society and Health
James A. Baker III Institute for Public Policy
Rice University
6100 Main Street, MS-40, Houston, TX 77005 USA
+1 713 348 2183 Fax: +1 713 348 5975
ktbeth@rice.edu

Currently the Texas Program for Society and Health (TPSH) is researching the potential of health impact assessment (HIA) in public policy development to improve population health (Higgins, forthcoming). This research examines HIA as a stand alone policy; however, other research suggests the environmental impact statement (EIS) could carry a great deal of the health impact burden itself. Through a grant from the Shell Center for Sustainability at Rice University, the TPSH is examining the power of health assessment within EIS. This project examines the feasibility of integrating robust assessments of health into the established structure of EIS in the United States. We believe incorporating health into federally mandated EIS could have a more immediate impact on population health. We also believe that by studying this integration, we could create a more complete methodology and strong quantitative measures that could be used in the creation of HIA as a national stand alone policy. Houston, "the energy capital of the world," offers an enormous energy market engaged in active EIS. Our project works with these companies on a local level, examining how public sector policy (EIS) impacts the ability of the private sector to implement a sustainable future in regards to population health.

Key words: *health impact assessment; environmental impact statement; public policy; sustainability.*

ENVIRONMENTAL ASSESSMENT DURING ROUTE SELECTION FOR TRANSMISSION LINES IN MEXICO (poster)

León-Burgos, Fidencio
Residencia Regional de Construcción Peninsular
Comisión Federal de Electricidad Carretera Mérida-Umán por Anillo
Periférico S/N Segunda
Entrada. Colonia Cd. Industrial 97280 Mérida, Yuc.
fidencio.leon@cfe.gob.mx

Hernández-Álvarez, Francisco; Zúñiga-Gutiérrez, Guillermo
Asesoría Ambiental Subdirección de Construcción
Comisión Federal de Electricidad
Río Mississippi 71 9° Piso Col., Cuahutemoc. 06500
francisco.hernandez@cfe.gob.mx
guillermo.zuniga@cfe.gob.mx

Evaluation of project alternatives is one of the most important issues of the environmental impact assessment because it maximizes the benefits and minimizes the environmental costs of a project and it helps to manage the uncertainty. Alternative comparison provides the framework for a decision more than a mere justification of a proposal.

The Mexican Federal Power Company (Comisión Federal de Electricidad) is developing a process for selecting the route for new transmission lines considering social, cultural, environmental and technical issues.

We describe the environmental assessment process of the alternative routes considered for constructing a new transmission line and the procedure for incorporating the result of this assessment into the integrated analysis for selecting the trajectory for developing the project.

Key words: *alternative assessment; environmental impact assessment; transmission line*

PROMOTING SUSTAINABLE INFRASTRUCTURE DEVELOPMENT IN CANADA: AN EMERGING PROGRAM FRAMEWORK FOR ENVIRONMENTAL SUSTAINABILITY AT INFRASTRUCTURE CANADA (poster)

Grady, Keith
Infrastructure Canada
90 Sparks Street, Suite 606, Ottawa, ON K1P 5B4 Canada
+1 613 954 1372 Fax: +1 613 946 9888
grady.keith@infrastructure.gc.ca

Infrastructure Canada, a recently created department of the Government of Canada, manages several national programs that deliver billions of dollars in new investment for sustainable economic growth in urban and rural communities across the country. For infrastructure development to fully contribute to improved quality of life and economic prosperity, it must be based on principles of environmental sustainability.

This poster proposes a framework that is being developed to review and promote environmental sustainability in the selection, evaluation and approval of infrastructure projects for financial support by the department. It advances the position that, for maximum public benefits to be realized from this investment, proposals need to be considered both in respect of potential environmental effects and opportunities for advancing related sustainability objectives. Toward this end, the poster cites a number of sustainability considerations relating to projects eligible for consideration under the Canada Strategic Infrastructure Fund and outlines a process leading to the specification of environmental sustainability related requirements in allocation decisions by Infrastructure Canada. Major steps in the process of considering specific proposals for infrastructure development include: identifying sustainability issues and opportunities; planning and conducting environmental assessment and other review, negotiation and development activities; preparation of a management plan detailing sustainability related terms and conditions for approval; decision-making; and monitoring and follow-up. The poster also refers to administrative and coordination considerations.

This topic is also the subject of a paper to be delivered at the conference.

Key words: *infrastructure, environmental sustainability, Government of Canada, Infrastructure Canada*

ENVIRONMENTAL FACTORS ANALYSIS FOR EIA ASSOCIATED TO A HYDROELECTRIC PROJECT: FROM QUALITATIVE TO QUANTITATIVE (poster)

Hernandez-Alvarez, Francisco; Zuniga-Guiterrez, Guillermo; Lecanda-Teran, Carlos
Comisión Federal de Electricidad
Rio Mississipi No. 71 - 11o piso
Mexico DF| 06500 Mexico
+52 55 52294400 Fax : +52 55 52294400
francisco.hernandez@cfe.gob.mx
guillermo.zuniga@cfe.gob.mx
carlos.lecanda@cfe.gob.mx
www.cfe.gob.mx

Rosas-Pérez, Irma; Rojas-Garcia, Omar
Universidad Nacional Autonoma de Mexico
Programa Universitario de Medio Ambiente
Costado Norte del Conjunto "D" y "E"
de la Facultad de Química Circuito de la Investigación
Científica s/n. Ciudad Universitaria
Mexico DF 04510 Mexico
+52 55 5622 5212 Fax: +52 55 5622 5207
puma@servidor.unam.mx
omarojas@sid.unam.mx
www.unam.mx/puma

Siebe-Grabach, Christina
Universidad Nacional Autonoma de Mexico
Instituto de Geologia
Ciudad Universitaria
Mexico DF 04510 Mexico
+52 55 5622 4265 X-155 Fax: +52 55 5622 4317
siebe@servidor.unam.mx • geologia.igeolcu.unam.mx

Lopez-Olalde. Sofia
Universidad Nacional Autonoma
de Mexico. Programa Universitario
de Medio Ambiente
Costado Norte del conjunto "D" y "E"
de la Facultad de Quimica. Circuito de la
Investigacion Cientifica s/n Ciudad Universitaria
Mexico, DF 04510 MEXICO
+52 55 56225212 Fax: +52 55 56225207
slopezsid.unam.mx • www.unam.mx/puma

It's well known that the environmental impacts associated to a dam construction for hydroelectric power (in this case the Hydroelectric Project "La Parota"), are very complex and hard to follow. The construction of this project will cover an extensive area, affecting different elements of the environment including the soil. In order to identify which factors are involved on the degradation of the soil such as the erosion, the loss of soil potential and organic mater, among others, we need to design environmental indicators to improve the ability to report the status of trends in those environmental conditions. Usually the impacts matrixes for

the EIA are filled up with values product of a qualitative analysis; this work is contributing by the incorporation of a method able to give us a quantitative analysis of the different components and the associated impacts, before the matrix is filled-up On the other hand, it helps to establish the different mitigation initiatives and the follow-up of the activities for the project.

Key words: *EIA, hyroelectric project, impacts, indicators, soil*

SHOULD YOU TRUST VOLUNTARY INITIATIVES: VERIFICATION OF CANADIAN CHEMICAL COMPANIES UNDER RESPONSIBLE CARE

Byer, Philip H.
Dept. of Civil Engineering
Division of Environmental Engineering
University of Toronto
35 St. George Street, Toronto, ON M5S 1A4 Canada
+1 416 978 5980
byer@ecf.utoronto.ca

The effectiveness and public acceptability of voluntary environmental initiatives is dependent on meaningful processes to verify compliance with the expectations of the initiatives. This paper discusses the Responsible Care initiative of the Canadian Chemical Producers' Association (CCPA), and the process for verifying whether Canadian companies are meeting their obligations under Responsible Care. The author was a member of the CCPA's National Advisory Panel from 1989 to 2003 and a member of its Responsible Care Steering Committee, and has been a member of teams that have carried out verifications of chemical companies since 1993. The paper first describes the basic elements (ethic, principles and codes) of Responsible Care, then explains the verification process (who does it, how often, its purposes and methods, reporting and follow-up), and describes how environmental and social impacts and public accountability are addressed. The paper also includes the author's observations on the effectiveness of the verification process and what elements should be required in order to gain public trust in an industry voluntary initiative.

Key words: *voluntary environmental initiatives, chemical producers, responsible care*

PROBLEM STRUCTURING METHODS FOR TECHNOLOGY FUTURES ANALYSIS

Cunningham, Scott
Technology University of Delft
Postbus 5015, 2600 GA Delft
Jaffalaan 5 2628 BX, Delft The Netherlands
+31 015 27 87187 Fax: +31 015 27 86439
www.tbm.tudelft.nl

Innovation provides opportunities for strategic renewal for industry. Significant contributions might be made to innovation by technology assessment techniques that guide the comparison and choice of prospective technologies. Technology futures analysis is one means for guiding difficult choices about science, technology, and innovation. The management of innovation presents a class of problems which are unstructured, and characterized by multiple and divergent perspectives. Methods for impact assessment are needed which are specifically designed for multi-actor settings.

Problem structuring methods constitute a family of operations research techniques. These techniques, however, were made in counter reaction to traditional "hard" operations research approaches. Such approaches presume the significant strategic choices needed to narrow the problem to a set of objectives and constraints have already been made. Fundamental assumptions behind these hard operations research models limit their applicability to many problems. Problem structuring methods were designed specifically for settings with multiple actors, multiple perspectives, and key uncertainties.

This paper reviews problem structuring methods, and examines the applicability of these techniques for technology futures analysis. Examples of problem structuring methods include the strategic options development and analysis approach, and the socio-technical systems approach. The full testing and application of these techniques to real world problems is comparatively new. Previous application in transport planning, technology transfer, and social impact assessment have been promising.

The material in the paper engages with an ongoing and international discussion by the Technology Futures Analysis Methods Working Group. In particular, the working group has asked: Can experimental economics models create a simulated market whereby viewpoints or tactics about the marketing of innovations may be tested? Can electronic discussions be effectively combined with personal interaction? In examining these questions we ask the extent to which human participation in problem structuring methods might be computer mediated.

Key words: *Technology Futures Analysis, problem structuring methods, innovation, computer mediation*

SOCIAL IMPACT ASSESSMENT IN DEVELOPMENT DECISIONS (poster)

Burdge, Rabel
Western Washington University
Bellingham-USA
PO Box 4056, Bellingham, WA 98227-4056 USA
+1 360 676 9892 Fax: +1 360 715 0985
burdge@cc.wwu.edu

This poster illustrates the use of SIA at the community and project level to help planners, change agents, elected officials and concerned citizens understand future change in their community as a result of project implementation or policy

change. After a brief definition of SIA and a history of its use in the planning process, the basic Social Assessment Model is laid out. I provide visual examples of how an SIA matrix can be used in a variety of project and policy settings. Next the SIA scoping process is outlined as the way to identify likely social impacts (issues) based on past research and assessments of similar project and policy changes. The content of the social assessment (analysis) is made up of 28 social impact assessment variables (social science indicators) used to explain change in a variety of project/policy settings. These indicators have been extracted from completed EIAs and SIAs and social science research on rural and urban communities. Next is a definition and ways of measuring and analyzing selected SIA variables, followed by demonstrations of significance and procedures for reducing the number of SIA variables to fit a project setting. The use of different data sources for social assessments is also shown. The presentation includes a ranking procedure for the selection of significant SIA variables. Once identified, these SIA variables become the basis for mitigation and enhancement of the social change process. Examples of mitigation and enhancement alternatives are displayed for a representative project. The poster concludes with an outline for presenting the analysis and the SIA key citation index.

Key words: *social impact assessment, development, planning, social change*

REGIONAL LANDSAT VEGETATION MAPPING OF THE OIL SANDS REGION OF ALBERTA, CANADA (poster)

Adams, Austin; Gilchrist, Ian; McPherson, Justin; Wilson, Brian D.J.
Golder Associates Ltd.
1000, 940 - 6th Ave. SW, Calgary, AB T2P 3T1 Canada
+1 403 299 5600
Austin_Adams@golder.com
Ian_Gilchrist@golder.com
Justin_McPherson@golder.com
Brian_DJ_Wilson@golder.com

Vegetation communities in the Oil Sands Region of Alberta, Canada were mapped using Landsat satellite imagery and GIS to allow the relative abundance of plant communities to be compared within the region. Landsat Thematic Mapper (TM) satellite imagery was collected for two scenes in the summer of 1999. The scenes were georeferenced and mosaicked together as a single image. Approximately 200 ground-truthed sites were collected to verify and train the satellite imagery. The sites were collected based on locations from aerial reconnaissance and 1:20,000 forestry information. Additional regional information sources and surveys were employed to ensure the mapping was representative of the region.

Unsupervised classification initially yielded approximately 100 classes using all seven TM spectral bands. Using training data for reference, these clusters were assigned to the vegetation classes of interest. Even with 100 classes, there were spectral similarities between the naturally occurring clusters. Pixels that could not be successfully assigned to one of the vegetation classes were extracted from the image and reclassified. Reclassification was an iterative process, clustering pixels with similar spectral signatures. Where necessary, land cover classes that were not true to identified classes were reclassified based on additional information.

Classification accuracy was performed using the testing sites and an error matrix was produced. The accuracy of the Landsat imagery classification was identified as 76%.

Key words: *Oil Sands, mapping, vegetation, landsat, remote sensing, supervised classification*

PROPOSED COMMUNITY BASED MONITORING OF AQUATIC AND TERRESTRIAL RESOURCES IN THE OIL SANDS REGION, NORTHEASTERN ALBERTA FOR THE MIKISEW CREE FIRST NATION DEVELOPMENT INTERVENTION

Wells, Joseph
IEG Environmental
1338R - 36 Avenue Northeast
Calgary, AB T2E-6T6 Canada
+1 403 219 1263 Fax: +1 403 291 1150
jwells@ieg.ca • www.ieg.ca

Lawe, Lori Brewer
IEG Environmental
+1 403 219 1265 Fax: +1 403 291 1150
llawe@ieg.ca

The Mikisew Cree First Nations (MCFN) Traditional Lands include much of the area traditionally referred to as the Oil Sands Region, in Northeastern Alberta. The industrial footprint due to the oil and gas industry on the Mikisew Cree Traditional Lands is extensive. Approvals for oil sands development mandate that monitoring programs be developed to assess environmental impacts. The Regional Aquatics Monitoring Program (RAMP) is a joint environmental monitoring program that assesses the health of rivers and lakes in the Oil Sands Region. The Cumulative Environmental Management Association (CEMA) mandate is to provide a forum for regional stakeholders to make consensus-based decisions on managing the region's cumulative environmental effects. Concerns by various stakeholder groups regarding the processes and deliverables of the RAMP and CEMA institutions have been voiced. A prime concern is that present monitoring programs are primarily managed and controlled by development proponents.

IEG Environmental was requested by the MCFN Industry Relations Corporation to develop and administer a monitoring program, in response to the MCFN needs as an intervener at the at the CNRL Horizon and the Shell Jackpine hearings. The proposed monitoring program is based on Environment Canada's nationally recognized Canadian Community Monitoring Network (CCMN). The

Ecological Monitoring and Assessment Network and the Canadian Nature Federation have worked in concert with Environment Canada to develop nationally recognized standards for community based monitoring. A community based monitoring program based on the CCMN model would augment and improve the RAMP and CEMA institutions. If community based monitoring uses the same sampling protocol as RAMP, then data collected in a community based monitoring model could be used to augment the RAMP dataset. Ultimately the use of this approach to monitoring will begin to reflect the value base of all area residents. This will make the data a more trusted tool in overall management decisions.

Key words: *monitoring,First Nations, community based,Oil Sands, water, terrestrial*

IMPACT ON LOCAL COMPANIES AND WORKERS OF THE ENVIRONMENTAL AND SOCIAL CLAUSES IN PROCUREMENT BIDDING DOCUMENTS IN A LARGE INFRASTRUCTURE PROJECT: THE CASE OF THE CHAD - CAMEROON OIL DEVELOPMENT AND PIPELINE PROJECT

Noubissie Ngankam, Emmanuel
The World Bank
Cameroon Resident Mission
P.O. Box 1128 Yaounde
+237 220 38 15 Fax: +237 221 07 22
enoubissie@worldbank.org

Mercier, Jean-Roger
Quality Assurance and Compliance Unit (ESDQC)
World Bank
Room MC5-135, 1818 H Street NW
Washington, DC 20433 USA
+1 202 473 5565 Fax: +1 202 477 0565
jmercier@worldbank.org
www.worldbank.org/environmentalassessment
www.worldbank.org/sea
www.worldbank.org/safeguards

The Environmental Assessment (EA) of the 3.8 billion $ project (largest single investment in Sub-Saharan Africa, funded, among other financiers, by IFC and the World Bank) was one of the key prerequisites to the approval of the project and World Bank group involvement. The main features of the EA and its preparers are presented and commented. The EA contained, as required by World Bank policies, an Environmental Management Plan (EMP), prepared in 1999 (one year before World Bank's approval of the project) which document provides the basic description of the environmental aspects of the project, and is a contractual framework committing the parties to the appropriate implementation of the project. The main features of the EMP and its method of preparation are presented and commented.

The bidding process involved international and local companies as bidders, in several sectors (described) and the selection process followed is presented and commented.

The results of an ad hoc survey provides the core of this paper. It basically assesses the degree and level of involvement of local companies in the Project, their pre-existing knowledge of environmental and social clauses prior to the Project, appreciates the efforts made to comply with these requirements, assesses the discriminating aspect of these clauses, describes in qualitative terms the adaptation capacity of the local companies. It then goes on to look at to which degree the environmental and social clauses are now part and parcel of routine practices for these companies. Eventually, it assesses the level of interest and the real need for training and awareness raising from the part of these local companies The results of the survey are benchmarked with other internationally funded petroleum and/or pipeline projects in Africa and other places with low pre-project environmental and social management capacities (Angola, Azerbaijan-Georgia-Turkey).

Key words: *bidding documents, environmental clauses, environmental specifications, impact on local companies, capacity building*

CASE STUDY: POLLUTION PREVENTION INITIATIVES AT AN INDUSTRIAL WASTEWATER TREATMENT PLANT

Hall, Freddie
US Air Force
7701 Arnold Street, Suite 205
Tinker AFB, OK 73145-9100 USA
+1 405 734 3114 Fax: +1 405 734 5148
freddie.hall@tinker.af.mil

During production and maintenance operations at the Oklahoma City Air Logistics Center [OC-ALC], industrial wastewater streams are generated which contain organic and heavy metal compounds. These waste streams result from chemical depainting operations, chemical cleaning processes, and electroplating operations. Processes discharging wastewater are treated at the on-site industrial wastewater treatment facility [IWTF]. The objective of this paper is to highlight some of the experiences that OC-ALC engineers have had over the last years with everything from odor mitigation efforts to evaluating the performance of zeolite media pressure filters. The presentation shall include the following topics: 1. POTW NESHAP: Determine if the OC-ALC IWTF was considered to be a major or minor source as defined by the National Emission Standards for Hazardous Air Pollutants [NESHAP] for Publicly Owned Treatment Works [POTW]. 2. INVESTIGATION OF IWTF ODORS: OC-ALC has made numerous process changes to minimize the odors and improve operations. 3. AIR-SPARGED HYDROCYCLONE TECHNOLOGY: Collaboration with Air Force Research Laboratory to investigate, evaluate, field-test, and design an air-sparged hydrocyclone [ASH] system for application at OC-ALC. 4. IWTF EMISSION FACTORS:

Collaboration with the Oklahoma State University Department of Civil Engineering to develop emission factors for individual process units [i.e., oil-water separators, equalization basins, solid contact clarifiers, lift stations, etc.] at the industrial waste treatment plant. This will be accomplished through application of commercially available computer models [General Fate Models, i.e., WATER9 and TOXCHEM3]. 5. IWTF LIFECYCLE COSTS: Collaboration with the US Air Force Academy Student Research Program to quantify the lifecycle costs associated with operating the industrial wastewater treatment plant processes. This effort quantified IWTF operating costs, i.e., sludge disposal, utility, process unit maintenance, equipment, chemical treatment, labor, etc.

Key words: *industrial wastewater treatment, pollution prevention*

STRATEGIC ENVIRONMENTAL ASSESSMENT OF A LARGE RURAL DEVELOPMENT PROGRAMME IN ETHIOPIA

Rydgren, Bernt
SwedPower AB
P.O. Box 1842, Linköping SE-581 17 Sweden
+46 13 254322
bernt.rydgren@swedpower.com

Afework, Yohannes
Environmental Protection, Land Administration and Use Authority
Bahir Dar, Amhara, Ethiopia
yoh45@freemail.et

The SEA was conducted as part of requirements for future funding of the SARDP (the Sida-Amhara Rural Development Programme), and as a combined study and capacity-building input to the local environmental-assessment competent authority. Three alternative development scenarios were chosen for the assessment: the 0 alternative; the programme as it has been implemented, and an idealised solution that would have attended fully to all identified strategic environmental priority issues. These three alternatives were then semi-quantitatively scored and compared with the 0 alternative. The present programme scored quite well, higher than the 0 alternative in almost all categories. The only exception that stood out was in the case of rural energy, an important but neglected issue. The idealised case naturally scores quite a bit higher than the actual, but the difference is not alarming. Our conclusions are, in brief: · SARDP is a successful rural development programme in terms of environmental strategy and overall environmental impact, with only a few exceptions. This is in spite of rather weak attention to environmental strategy during the first two phases. In project formulation, a good strategy document was prepared, but this has largely been forgotten in formulations of later work programmes. · The most important omission in terms of long-term sustainability is the complete lack of attention to rural energy issues. The most important success story of the programme, from a sustainability point of view is clearly the land administration reform. In a very short time, a new law has been put in place, and successful field trials have been implemented. Strategically speaking there are some worries at local level regarding the comprehensiveness of the programme, given that some specific key development issues are excluded from the funding.

Key words: *SEA, rural development, Ethiopia*

CANADIAN PRACTICE IN SCOPING OF ENVIRONMENTAL ASSESSMENTS—THE LAW AND THE REALITY—PROPONENT AND PUBLIC INTEREST PERSPECTIVES

Estrin, David; Mesquita, Jennifer
Gowling, Lafleur Henderson, Barristers and Solicitors (Gowlings)
Suite 5800, 40 King St.. W.
Toronto, ON M5H 3Z7 Canada
+1 416 862 4301 Fax: +1 416 863 3401
David.Estrin@Gowlings.com
Jennifer.Mesquita@Gowlings.com

Deciding the extent of the project to be included in an impact assessment (scope of the project) and the extent and content of the assessment to be carried out (scope of the assessment) are two of the most critical decisions affecting EA practice.

Canadian Federal as well as provincial EA laws provide proponents and government regulators varying degrees of legal duties and discretion regarding both issues.

Often, members of the public are disappointed that proponents propose and government regulators allow the scope of a project to be narrowly defined and that they also may limit or eliminate discussion of need and broad alternatives.

To some extent these decisions are governed by legal requirements - but in practice there appears to be substantial discretion, with the courts not taking an overly intrusive oversight role.

This paper examines legislative requirements, proponent practice, government actions and court decisions to determine whether the objectives of EA, the goal of proponents, and public expectations are being achieved in decisions concerning the scope of project and scope of assessment.

Key words: *impact assessment, scoping, legal requirements, courts and tribunals, public interest, proponent's interest, Canadian practice*

STRATEGIC ENVIRONMENTAL ASSESSMENT IN KOREA

Kim, Myungjin
NEACEDT, Research Planning Division
National Institute of Environmental Research
Kyongseodong, Incheon 404-170 Korea
+82 32 560 7703 Fax: +82 32 568 2036
domyung@hanmail.net

Although Environmental Impact Assessment (EIA) in Korea has been improved markedly over the past two decades, by enlarging the range of projects for assessment, instituting public participation and environmental monitoring, and similar measures, it remains deficient in its coverage of programmes and plans at the policy level across major sectors such as large-scale development.

Strategic environmental assessment (SEA) can supply the necessary correctives providing useful measures and methods for integrating environmental considerations in the formulation and spatial and sectoral policies and their implementation in operational programmes. SEA understands as an approach to environmental protection and enhancement by asserting those concerns in formulating policies and devising alternatives for their implementation. This approach would offer significant improvements to the EIA system in Korea. It expects to solve development issues like the Saemangeum land reclamation project have long been in debate through earlier assessment at policy level.

In this process both institutional and methodological obstacles can be anticipated. Institutionally, ministerial resistance may arise from concerns about possible delays in policy reviews and increased programme costs. Methodologically, SEA effectiveness is limited by problems of professional judgment and public understanding. Its application in areas such as greenbelt planning, new town development, and environmental management requires further improvements in assessment tools. It would be useful to review more precisely what methodological improvements are needed and how they can be developed.

In response, the Ministry of Environment is preparing a task force to conduct research and development programme, followed by trial applications in selected policy arenas. Currently it is debating who is responsible agency, development agency or Ministry of Environment.

Key words: *EIA, SEA*

ENVIRONMENTAL MONITORING OF THE CONSTRUCTION SITES FOR THE OLYMPIC WINTER GAMES "TORINO 2006"

Livini, Monica; Massara, Matteo; Mezzalama, Roberto
Golder Associates
Via Banfo 43, Torino, Piemonte 10155 Italy
+39011233348 Fax: +39011856950
mlivini@golder.it
mmassara@golder.it
rmezzalama@golder.it
www.golder.com

Salusso, Vittorio
Agenzia Torino 2006

The International Olympic Committee (IOC) and the Olympic Winter Games "Torino 2006" Organisation Committee (TOROC) have defined as one of their main objectives the protection of environment and human health and the improvement of the environmental quality of the areas involved during all stages of the organisation of the Games. To achieve these objectives, several tools have been developed. These tools include: the Strategic Environmental Assessment, the Environmental and Social Report etc. Among these tools, a comprehensive system of environmental monitoring for the construction of the Olympic facilities has been developed. The Olympic Agency in charge of the construction of the facilities has retained Golder Associates to organize and manage this system of environmental monitoring in the alpine range areas used by Alpine Games. In these areas the following sports events will be held: snowboard, free style, ski jumping, cross country skiing, skiing, bob sleigh, luge and skeleton. The construction works involved (Nordic combined, up to forty sites and comprise the following specific activities: construction and preparation of each contest track, construction of reservoirs and artificial snow making systems, construction of ski-lift and chair-lift facilities and improvement of the transport network. The environmental monitoring system is based on a set of indicators defined in agreement with the Regional Authorities. This system allows to define the baseline conditions and to track the overall changes of the state of the environment at any time during the implementation of the Olympic Programme in the three different phases ante operam, in operam and post operam. This set consists of a number of indicators related to the (Vibrations; (Noise (Air Quality (Water quality (following thematic areas: Fauna, flora and ecosystems. The data and information collected(Soil quality; are managed through a database and the deliverables include a tri-monthly report.

Key words: *environmental monitoring, Olympic Winter Games,Torino 2006*

THE CONVERGING EVOLUTION OF LAND-USE PLANNING AND STRATEGIC ENVIRONMENTAL ASSESSMENT

Hill, Richard
Dept of Environmental and Geographical Science
University of Cape Town
Rondebosch 7701 South Africa
+27 21 650 2786 Fax: +27 21 650 3791
hill@enviro.uct.ac.za

Fuggle, Richard
Dept of Environmental and Geographical Science
University of Cape Town

+27 21 650 4741
+27 21 650 3791
fuggle@enviro.uct.ac.za

The prevailing theory of planning is that it is essentially communicative action, in which planners work with the private sector to accomplish public goals, assemble effective teams, manage relations with stakeholders, and direct conflict towards constructive action. Although little has been written on the theory of why and how SEA is supposed to work, its proponents stress that it is inter-disciplinary, involves stakeholders, informs debate, reduces conflict, influences proposal design and improves decisions. Planning and SEA thus have very similar objectives.

Theoretically, SEA works as a policy instrument that allows proponents to develop an understanding of the reactions of potential critics. This enables them to select and design proposals and formulate mitigating measures that avoid or manage conflict. In this way, SEA is a process of mutual adjustment. Proponents and stakeholders are engaged in social learning and in balancing competing values.

SEA exerts less control over land use than was the case in earlier forms of planning where planners directed the type and location of development. SEA requires consideration of alternative objectives, sites, designs, and methods of implementation, and the proponent is centrally involved in the process of formulating these alternatives.

SEA thus entrusts more of the planning to the proponent, with the important procedural proviso that planning and decision making are conducted openly with the involvement of interested and affected parties in the process. Thus, SEA procedures and ethics require environmental professionals to give balancing voice and power to civil society.

SEA needs to converge with land use planning so that its worth as a form of mutual social adjustment and as a mechanism for balancing competing social values becomes accepted. If SEA remains divorced from land-use planning, it is in danger of being perceived as merely a procedural hurdle to development planning.

Key words: *SEA, strategic environmental assessment, land-use planning*

HEALTH IMPACT ASSESSMENT AND THE IMPROVEMENT OF ECONOMIC ASSESSMENT: REFLECTIONS AND AN INITIAL PROPOSAL FROM RECENT EXPERIENCES IN THAILAND

Sukkumnoed, Decharut
Aalborg University
Fibigerstraede 15, 9220 Aalborg, Denmark
+45 96 35 72 13 Fax: +45 98 15 10 85
decharut@plan.auc.dk

Nuntavorakarn, Suphakij; Sabrum, Nuntana
Health Systems Research Institute
Ministry of Public Health
Nonthaburi 11000 Thailand
+66 29 51 12 86 Fax: +66 29 51 12 95
suphakijn@yahoo.com
nuntana@hsri.or.th

In Thailand, impact assessment and economic assessments, like cost-benefit analysis and cost effectiveness, have been applied as a decision-making support tools for about three decades. However, the interconnection between these two important tools is usually overlooked. With the recent experiences in Thailand, it is clear that the insights from HIA can provide some reflections and initial ideas to improve economic assessments in order to support healthy public policy. Instead of calculating "the external costs" alone, there are a number of issues resulted from HIA studies that economists should reconsidered. It is clear that health impacts are not only costs or benefits of the whole society; it is also an issue of distributional effects or justice within the society. In reality, the synergy of different negative or positive health impacts may concentrate on some specific groups. Thus, the economic calculation should not only be the summation of all costs and benefits. It should also give more attention to the interactions between the impacts and people's coping capacities, especially the interconnection between health impacts and poverty. Moreover, the incompatibility of health determinants and impacts makes a traditional proposal for economic compensation become complicated and even ineffective in many cases. Last, since several health impacts are not only the temporarily loss of income or opportunities, it is also permanently limited of capabilities to achieve better quality of life (possibly longer than one generation), i.e. the irreversibility of health impacts. Therefore, economic method, which discounts future benefits and costs (down to zero in some certain years), is not suitable in this situation. Apart from these reflections, the last part will provide an initial proposal to improve the applications of economic assessment. Hopefully, it can pave the ways to make better interconnection between these two main decision-making tools, especially for developing countries.

Key words: *health impact assessment, economic assessment, cost-benefit analysis, Thailand*

SOCIAL IMPACT ASSESSMENT AND OFFSHORE OIL AND GAS (MMS SESSION DESCRIPTION/OPENING PRESENTATION)

Cluck, Rodney
381 Elden Street, Herndon, VA 20170 USA
+1 703 787 1087 Fax: +1 703 787 1026
rodney.cluck@mms.gov • mms.gov

This session discusses social impacts of offshore oil and gas development on human communities in the Gulf of Mexico and Alaska. It addresses the analysis of impacts under the National Environmental Policy Act (NEPA), and focuses primarily on social effects as opposed to economic or psychological ones. First, we discuss the "classic SIA model,"

the original boomtown model that established the underlying issues, questions, and logic that shape most energy-related socioeconomic assessments. We show that, at the core of this model, project-induced demographic change drives other project-related socioeconomic effects. Second, we describe significant differences between classic model assumptions and the actual demographic consequences of the Gulf of Mexico's and Alaska's oil industry. We show that the industry's effects have been large, long term, widely distributed, based on laws and fiscal policies and locally variable and that they are inadequately addressed by the project-oriented classic SIA model. Third, we return to the classic model and conclude that none of its basic assumptions fit OCS regional realities and that the model is incapable of addressing situations with the magnitude, longevity, or complexity of that faced by social impact assessment in the Gulf of Alaska. This discussion concludes by outlining a strategy for addressing the kinds of assessment problems faced by MMS and by many other federal agencies charged with similar responsibilities.

Key words: *social impact assessment, offshore oil and gas, boom and bust, outer continental shelf*

CAMEROON'S OIL AND GAS INDUSTRY: CONTROLLING PROJECT ENVIRONMENTAL PERFORMANCE BEYOND EIA

Burns, Michael
CSIR
PO Box 320, Stellenbosch, 7600, South Africa
+27 21 8882404 Fax: +27 21 8882693
mburns@csir.co.za

The Republic of Cameroon is a modest oil-producing country located within the Central and West African region. Currently, oil production is derived from shallow water nearshore concessions, with exploration activities also largely concentrated in the same environment.

The implementation of environmental impact assessment (EIA) in advance of project developments by the oil and gas sector is a relatively recent phenomenon within Cameroon. Although the country has in place an Environmental Framework Law, which regulates the activities of the oil and gas sector, a decree of application, which specifies an EIA procedure, has yet to be issued. In this situation, there is a statutory requirement for industry best practice to be adopted; e.g. for the procedure regarding EIA in neighboring countries to be applied. Cameroon is, however, proving to be a leader in this respect, rather than a follower, and this extends also to important EIA follow-up initiatives that are taking shape within the country.

The current approach to EIA of developments by the offshore oil and gas industry includes a strong focus on establishing the state of marine water quality and mangrove vitality, insofar as these could be at risk from oil spills. This is linked to both the pre-development EIA phase and the post-development situation.

Systematic, repeat sampling and chemical analysis of bio-indicator species (e.g. filter feeders such as oysters) and shoreline sediments is undertaken as a component of EIA and in subsequent monitoring. Chemical analysis of biological tissue and sediments establishes the presence of hydrocarbon product and associated metals, and data interpretation reveals trends in this regard. Results assimilated over time can indicate deterioration or improvement in marine water quality. Fingerprinting of stranded hydrocarbon product using chromatogram profiles assists in establishing the origin of marine pollution.

Taking a more strategic-level perspective of marine water quality monitoring, the country's recently prepared National Oil Spill Contingency Plan provides a structure for the archiving and interpretation of long-term marine water quality data derived from EIA and follow-up environmental monitoring.

Key words: *Cameroon, oil and gas, environmental impact assessment, oil spill contingency planning, environmental monitoring, marine water quality*

LESSONS LEARNT IN ADDRESSING ENVIRONMENTAL ISSUES OF INFRASTRUCTURE DEVELOPMENT IN THE WATER INDUSTRY: A CASE STUDY IN KWAZULU-NATAL, SOUTH AFRICA

Archer, Lyn
Umgeni Water
310 Burger Street, PO Box 9, Pietermaritzburg
KwaZulu-Natal 3201 South Africa
+27 33 341 1345 Fax: +27 33 341 1218
lyn.archer@umgeni.co.za

Gillham, Steve
Umgeni Water
+27 33 341 1131 Fax: +27 33 341 1218
steve.gillham@umgeni.co.za

Developing new water resource projects without taking cognisance of the environmental impacts, both bio-physical and social, has received global condemnation for many years now and is largely becoming a practice of the past. However, it is the prominence, extent of issues addressed, timing and intensity of the investigations and the commitment to environmental protection and mitigation at the construction stage that has increased significantly over the past few years. Practices in the South African water industry are no exception to this.Environmental legislation in South Africa requires that an Integrated Environmental Management (IEM) approach be adopted when any new project is being considered. This IEM approach was recently put to the test in South Africa during the planning and implementation of an inter-basin transfer scheme in the province of KwaZulu-Natal. The scheme required the building of a new large Mearns Weir, the raising of Midmar Dam, the acquisition of the servitude of aqueduct along the receiving streams and the upgrading of infrastructure along the streams to accommodate the raised water levels. This paper will discuss

the steps that were taken to address the environmental issues during a protracted planning phase, and what was accomplished. It will compare how these recommendations were taken forward into the construction phase and the operations phase, identify some of the shortfall of existing practices and discuss the lesson learnt from the process.

Key words: *environmental impact assessment, environmental management plan, inter-basin transfers*

SEA AND HYDROLOGICAL PLANNING: TWO SYNERGETIC EUROPEAN DIRECTIVES

Gullón, Natalia
Confederación Hidrográfica del Júcar
Ministerio de Medio Ambiente
Avda. Blasco Ibáñez, 48
46010 Valencia, Spain
+96-3938800 Fax: +96 3938801
nataliagullon@hotmail.com

Within the water sector, strategic environmental assessment of decision-making is crucial, not only due to the own nature of the resource, but also because of the peculiar characteristics of hydraulic projects.

We are facing a key moment, in which the efforts to implement both the Directive on SEA and the Water Framework Directive coincide, together with a special consciousness on hydraulic resources, after the International Year of Freshwater 2003, and in a context of world water crisis.

The purpose of the WFD-incorporated last December into member states legislation - is "to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater," and it requires --among others--the preparation of river basin management plans and programmes of measures. What are the links between this Directive and the SEA Directive? Do they overlap? Have we lost the opportunity to incorporate environmental criteria into hydrological planning?

This paper explores the contribution that SEA could make towards a sustainable planning and management of water resources--especially in the framework of the river basin districts--and the role that these bodies could play in the application of the SEA Directive.

Key words: *decision-making, directive, hydrological planning, strategic environmental assessment, SEA, water*

DEVELOPING SUSTAINABLE DEVELOPMENT INDICATORS FOR THE ELECTRIC UTILITY INDUSTRY

Searcy, Cory
University of Alberta
3 Sorrel Lane, Winnipeg, MB R2E 0E4 Canada
+1 204 333 2577 Fax: +1 204 668 5088
csearcy@ualberta.ca

McCartney, Daryl
University of Alberta
Civil and Environmental Engineering
Edmonton, AB T6G 2G8 Canada
+1 780 492 4738 Fax: +1 780 492 8289
daryl.mccartney@ualberta.ca

Karapetrovic, Stanislav
University of Alberta
Mechanical Engineering
Edmonton, AB T6G 2G8 Canada
+1 780 492 9734 Fax: +1 780 492 2200
s.karapetrovic@ualberta.ca

There is a pressing requirement to determine how electricity needs can be met in a more sustainable manner. Although many electric utilities have begun developing strategies for addressing the challenge of sustainable development, there are ongoing requirements to find methods of measuring progress with respect to the economic, environmental, and social impacts of electric utilities. Fundamental to this task is the creation and implementation of sustainable development indicators. This paper presents a proposed Sustainable Development Indicator (SDI) Design Process for electric utilities in an effort to advance this ongoing work. The development of the protocol was based on collaboration with an electric utility and also involved extensive consultation with external expertise. Systemized through unique process flow charts, it provides a proactive, flexible, and transparent approach to developing and implementing indicators. The six step process to create sustainable development indicators at an electric utility is: (1) conduct a needs assessment, (2) conduct process planning, (3) develop a draft set of indicators, (4) test and adjust the indicators, (5) implement the indicators, and (6) review and improve the indicators. To address the most urgent needs of the electric utility industry, particular emphasis is devoted to the third and fifth steps. With these points in mind, the SDI Design Process will provide a rationale basis for improved design of sustainability indicators at electric utilities.

Key words: *sustainable development, indicators, integrated management systems, electric utilities*

INTEGRATED ENVIRONMENTAL, SOCIAL AND HEALTH AND SAFETY MANAGEMENT SYSTEMS AS A COMPLEMENT TO THE ESIA PROCESS

Neame, Peter
International Finance Corporation
2121 Pennsylvania Ave. NW
Washington, DC 20433 USA
+1 202 473 1564 Fax: +1 202 974 4351
pneame@ifc.org
www.ifc.org

Flanders, Nicholas
International Finance Corporation
+1 202 473 3479 Fax: +1 202 974 4351
nflanders@ifc.org

The International Finance Corporation (IFC)--the private sector arm of the World Bank--has an investment assessment process which incorporates a standard ESIA approach-through identification of environmental and social impacts, to definition of mitigative measures and specification of a corrective action plan (CAP). Increasingly, IFC sees significant advantages in complementing this up-front assessment with the establishment in the client's company of a formal environmental management system to provide the framework for the ongoing assessment of environmental and social impacts, monitoring of regulatory compliance and progress towards completion of the CAP. Formal environmental management systems are attractive for this purpose in that they provide a defined framework which is subject to independent external auditing to internationally-agreed standards and which is adaptable to a wide range of project types and sectors. IFC's assessment covers environmental and social impacts including a focus on occupational health and safety issues. These can be combined in an integrated management system which incorporates both the ISO 14001 and OHSAS 18001 standards. It is necessary to ensure that the regulatory compliance aspects and other mitigation measures are properly identified in the system's objectives and targets. This paper addresses IFC's approach to incorporation of environmental, social and health and safety aspects in an integrated management system, and how this can serve as a framework for supervision of IFC investments in a variety of sectors.

Key words: *integrated EMS, environmental and social impact assessment*

ADDRESSING THE SOCIAL DIMENSIONS OF PRIVATE SECTOR PROJECTS

Sequeira, Debra; Pollett, Edward (Ted); Brusberg, Eric; Zevallos, Jose
International Finance Corporation
2121 Pennsylvania Ave. NW, Washington, DC 20433 USA
+1 202 458 7406
dsequeira@ifc.org
tpollett@ifc.org
ebrusberg@worldbank.org
jzevallos@ifc.org
www.ifc.org

The management of social issues poses a key challenge for many private companies operating in emerging markets. Identifying and addressing these issues early on and managing them actively throughout the project can increase the likelihood of project success by: creating broader social support for the investment, reducing risks and uncertainties, enhancing the company's reputation, and, helping to maintain a local license to operate. The International Finance Corporation has recently issued a Good Practice Note on social impact assessment designed to provide private sector companies and practitioners with how-to guidance in identifying and assessing impacts and opportunities in IFC-financed projects. The paper argues that it is in the best interest of private sector companies to have solid socioeconomic data upfront as a means of reducing and managing social risks and improving project design. IFC's model is characterized by an integrated approach to environmental and social issues (resulting in a combined ESIA document) and is specifically targeted at the project level and to private sector investments in developing country contexts. Another unique feature of IFC's approach is the use of SIA as a tool for the proactive identification of sustainable development opportunities that may arise within the context of a project. This constitutes a significant departure from traditional impact assessment methodologies which tend to focus primarily on the identification and mitigation of adverse impacts. IFC advocates expanding the scope and function of the social assessment process to look at positive impacts and opportunities to enhance the socioeconomic well-being of communities in the project's area of influence. The Good Practice Note has been written by a team of IFC Social Development Specialists based on their applied experiences and lessons learned in private sector operations across a broad range of industry sectors and regions.

Key words: *social impact assessment, ESIA, social risk, private sector, international finance*

THE ROLE OF DEVELOPERS IN IMPLEMENTING LOW IMPACT URBAN DESIGN IN HOUSING DEVELOPMENTS IN AUCKLAND, NEW ZEALAND

Heslop, Viv
Department of Planning
University of Auckland
Private Bag 92019, Auckland, New Zealand
+64 9 8467177 Fax: +64 9 8467177
viv@woosh.co.nz

Dixon, Jenny
Department of Planning
University of Auckland
+64 9 373 7599 ext.5344 Fax: +64 9 373 7652
j.dixon@auckland.ac.nz

Lysnar, Penny
Department of Planning
University of Auckland
palysnar@ihug.co.nz.

The Auckland Region, which contains over 30% of New Zealand's population, is undergoing rapid growth. The region's population is expected to double in the next 50 years. This growth is putting enormous pressure on the development of land for new housing. Regional and local regulators have adopted a strategy of intensification to curb urban sprawl. The strategy includes the development of green field sites and intensification of established urban areas

through the provision of medium and high density housing in the context of sustainable management. There is increasing recognition of the need, by both local and central government, to improve the sustainability of New Zealand's cities and towns through measures such as reducing the environmental impacts of infrastructure. Accordingly, developers have an important role to play in the implementation of low impact sustainable urban design solutions.

This paper draws on a pilot study carried out in Auckland which looked at the extent to which developers considered impacts, particularly environmental impacts, in the design and construction of medium housing developments. The impacts were considered in the context of sustainable urban design. We were interested in finding out whether developers consider the incorporation of low impact design features when planning medium density housing projects, the impediments to incorporating these features and what would assist them to incorporate these features in the future.

The paper then examines how we can use this information to work with developers to encourage the incorporation of low impact urban design features in future developments. A critical element in achieving more sustainable urban environments is the need for the development community to understand the role of impact assessment when looking a range of ways of undertaking developments, from the conventional to the innovative.

Key words: *developers, medium density housing developments, low impact design and development*

A CANADIAN PERSPECTIVE ON EIA AND AQUACULTURE DEVELOPMENT

Curtis, Mark
Dept. Natural Resource Sciences
McGill-UNEP EIA Collaborating Centre
Macdonald Campus
McGill University
21, 111 Lakeshore Road, Ste. Anne de Bellevue
Quebec H9X 3V9 Canada
+1 514 398 7728 Fax: +1 514 398 7990
curtis@nrs.mcgill.ca

Sadar, M. Husain
Dept. Natural Resource Sciences
McGill-UNEP EIA Collaborating Centre
Macdonald Campus
McGill University
+1 613 592 0450 Fax: +1 613 591 8956
husainsadar@rogers.com

Conley, David
Office of the Commissioner for Aquaculture Development
427 Laurier Ave., W., Suite 1210
Ottawa, ON K1A 0E6 Canada
+1 613 993 5057 Fax: +1 613 993 8607
conleyd@dfo-mpo.gc.ca

The growth of world aquaculture over the past two decades has been remarkable, now having attained a level accounting for more than 20% of global fish and seafood production. Current predictions anticipate that aquaculture will provide 50% of aquatic food production by the middle of the present century. It is obvious such rapid development can only be sustainable through adherence to stringent environmental quality standards and through good practice in the conduct of EIA for aquaculture. The ecological impacts of aquaculture in coastal marine and aquatic inland localities have ranged from benign to catastrophic, depending on the degree to which appropriate regional planning measures and environmental protection protocols have been developed and implemented. EIA has a critical part to play in guiding and complementing these processes, and as well to ensure that the socioeconomic and human health components of aquaculture development are fully taken into consideration. The application of EIA to aquaculture in Canada is implemented through the Canadian Environmental Assessment Act and guided by the Canadian Environmental Assessment Agency of Environment Canada. Impact assessments for aquaculture project proposals in marine coastal areas are generally conducted by the Department of Fisheries and Oceans. In practice, the utilization of EIA in the planning process for the development of Atlantic salmon production facilities on the coasts of Canada has met with varying success, and at present there remain challenges in ensuring that best practice protocols are consistently invoked. In common with comparable Atlantic salmon aquaculture regions in Europe, issues of fish farm wastes can satisfactorily addressed, but concerns about the spread of disease and the effects of escapees on wild fish populations remain problematic. This paper will identify and analyze key contentious issues associated with the application of the federal EIA process to aquaculture development proposals along the west coast of Canada.

Key words: *aquaculture, EIA, coastal zone management, sustainable development, marine, aquatic*

ACHIEVING ECOLOGICAL SUSTAINABILITY IN THE ENVIRONMENTAL ASSESSMENT REVIEW OF RUN-OF-RIVER HYDROPOWER PROJECTS IN BRITISH COLUMBIA, CANADA

Claus, Berni R.
Western Economic Diversification Canada
700 - 601 West Hastings Street
Vancouver, BC V6B 5G9 Canada
+1 604 947 9104
berni.claus@community.royalroads.ca

In response to issues such as the global need to reduce greenhouse gas production from electrical energy generation, increasing numbers of small and medium sized hydropower projects are being proposed in British Columbia, Canada. These renewable energy projects are also called "green energy," provided that they meet certain environmental, social and economic criteria. They are invariably run-of-river, with no appreciable storage. Usually these projects must

undergo a Canadian federal or provincial environmental assessment review. Environmental assessment has long been advocated as one method to help achieve ecological sustainability.

This paper proposes to help answer the following question: How can review agencies and proponents achieve ecological sustainability in the environmental assessment of run-of-river hydropower projects? How should they "...take actions that promote sustainable development" in their reviews as encouraged by the Canadian Environmental Assessment Act. This research proposes a vision that "lower impact run-of-river hydropower projects are identified, encouraged, and reviewed, through an environmental assessment process, to consistently and efficiently meet the goals of ecological sustainability." The question of ecological sustainability needs to be addressed from the "how" or process and people issues, the "what" or environmental science issues, and the interrelationships of these issues.

Important challenges relate to ecological streamflow needs and the capacity of reviewers and proponents to conduct the assessment. For reviews under the Canadian Environmental Assessment Act, the use of class screenings or class assessments offers a potential solution for those run-of-river project elements that are routine and generally understood. However, more immediate solutions lie with best management and technical guidelines that clearly and reasonably outline expectations. Other solutions lie with adaptive environmental management, building team learning capacity into interagency reviews, and the use of strategic environmental assessment to help address the cumulative environmental effects of many run-of-river projects within a single region.

Key words: *run-of-river hydropower, small hydro, environmental assessment, green energy, ecological sustainability, class assessment, class screenings*

AN EXPERIMENTAL STUDY ON THE MULTIGENERATIONAL WORKSHOP FOR SUSTAINABLE SOCIETY

Nishikizawa, Shigeo; Tanaka, Katsuyoshi; Harashina, Sachihiko
Tokyo Institute of Technology
4259 Nagatsuda-machi Midori-ku
Yokohama-shi, Kanagawa 226-8502 Japan
+81 45 924 5550 Fax: +81 45 924 5551
snishi@depe.titech.ac.jp
Ktanak@depe.titech.ac.jp
sahara@depe.titech.ac.jp

Making a sustainable society is one of the most important policies at present. Sustainability should be built from the points of view based on the community. Public participation is a fundamental process for implementation of environmental planning. In particular, future generations taking part in this process could make the plan feasible. This study focused on the workshop approach as one method that makes collaboration between adults and children. Two series of experimental workshops were carried out on Yakushima Island, one of the World Natural Heritages in Japan, to clarify the effect of the collaboration of different generations. In the first meeting, participants perceived the relationship between the nature and their life environment through the nature games. In the second, economical and social problems were mainly discussed by each group. While Yakushima attract a great deal of tourists, residents have faced serious problems such as luck of employment opportunities, depopulation of the young ages, waste problems and so on. So that it could be cleared the effect of the collaboration of different generations, workshops were divided into three groups: children only, mix of children and adults, and adults only. Analyzing workshop productions and questionnaire researches, the effect of the multigenerational workshop is revealed as follows: (1) a lot of multiple opinions which are produced by the participants has been gradually cleared as well as shared among the different generations, (2) while children tend to complain of their environmental situation, some children who belonged to the mixed group suggested some alternatives, (3) some mixed-group-children changed their awareness, such as judgment for reduction of public constructions through the interactive information exchange. Thus, a collaborative workshop is one of noticeable way to build capacity which enables young generations participate in the planning process.

Key words: *workshop, public participation, capacity building, sustainable society, World Natural Heritage*

TRANSBOUNDARY WINTER FOG IN PAKISTAN: CAN EIA PLAY A ROLE IN CONTROLLING TRANSBOUNDARY POLLUTION?

Saeed, Ahmad
Environment Assessment Services
IUCN - The World Conservation Union
Karachi 75530 Pakistan
+92 21 5374072/ 5374073 Fax: +92 21 5838106/ 5861448
ahmad.saeed@iucnp.org

Environmental Impact Assessment, to an extent, has played a positive role in checking pollution within the geographical boundaries of a country. However, despite efficacy at home, it has not been able to play a very effective role in combating transboundary movement of pollutants. The fog episode that occurs every winter in Pakistan and India is one transboundary issue that has not subsided despite increased use of EIA and its enforcement in both countries.

The transboundary movement of pollutants has become an increasingly serious issue due to rapid industrial development. This problem is quite palpable in Pakistan in the province of Punjab where life comes to a grinding halt during winters due to severe fog. Remote sensing satellite data shows fog covering an area approximately 1,500 km long extending from eastern India (Bihar) to northwestern Punjab. On December 16, 1998, the mean daily visibility in New Delhi was approximately 100 meters and during the same period in Lahore (approximately 450 km from New Delhi) it was

only a few hundred meters. Studies have shown that the fog episode is quite severe for two weeks in December and January and causes extensive economic loss and health problems in Pakistan.

A six year study (1997-2002) conducted by SUPARCO (Pakistan Space and Upper Atmosphere Research Commission) determined the concentrations of sulfates, nitrates and selected trace elements (Cr, Fe, Zn, As, Se and Sb) at Lahore and Islamabad during and after the fog by sampling and analyzing aerosols. The analysis showed excessively high sulfate (SO4) concentrations varying from 49.8 to 98.9 (g/m3. The sulfate and selenium ratios (SO4-2/Se) and 925 mb wind data suggest a distant source of sulfate.

The northeastern cities of Pakistan lie downwind to coal burning industries in India, receiving heavy loads of sulfur dioxide, which is the main constituent of the fog. Fog creates hazardous conditions for air and road traffic, human health and agriculture. The cities affected by the phenomenon get cut off from the rest of the country, thereby compounding the problem. Investigations are currently underway to study the economic and health implications of fog on the country.

It can be argued that the increase in the intensity and duration of fog during recent years could be due to low precipitation and the four year drought in the South Asia region. It can also be argued that although there is lot of talk about EIA enforcement, little has happened on ground and a policy of "business as usual" prevails. Further investigation is needed to fully understand the reasons behind the fog every year.

Key words: *air pollution, fog, India, Pakistan, South Asia, transboundary*

IS SEA THE ANSWER TO ENVIRONMENTAL DEGRADATION IN DEVELOPING COUNTRIES?

Saeed, Ahmad
IUCN - The World Conservation Union
1 Bath Island Road, Karachi 75530 Pakistan
+92 21 5374072/5374073 Fax: +92 21 5838106/5861448
ahmad.saeed@pc.iucnp.org

At present, experts are pushing SEA as the long-term solution to environmental degradation in a country. It is widely claimed and seen as an answer to EIA, which although successful at a certain level, has failed to deliver all expected results. SEA is being practiced in some developed countries like Netherlands, quite successfully and has also been made a legal requirement. Similarly some developing countries have also flirted with the idea but except for a few success stories (South Africa and Hong Kong), most have not gone beyond awareness raising.

Pakistan is one country which has tried to introduce SEA in the decision-making circles of the country but have not been able to take it beyond that. The countries that have succeeded with SEA thus far, are those which have strong implementing and enforcement institutions to provide support to policies. In most developing countries, however, the reality is that even if they manage to environmentally baptize their policies, they do not have institutions to support the implementation of those policies. In addition, other factors like lack of political will and resources (both financial and human), corruption, etc. are other major constraints. This paper argues that even if policies and legislation are environment friendly, there is no guarantee that the enforcement will be strong as well. A case study of the development of Pakistan Environmental Protection Act (PEPA) and examples from other countries will be used to support the argument.

Key words: *Pakistan, SEA*

ASSESSMENT OF HEALTH IMPACT ON SAMUT SONGKRAM PROVINCE: THE CASE STUDY OF PROJECT DIVERTING WATER FROM MAE KLONG RIVER (PHASE 1)

Sutipanwihan, Sanchai
Health System Research Institute
Kobkaew Manomaipiboon
Bundit Channarong
Jongdee Toim
Faculty of Environment and Resource Studies,
Mahidol University, Thailand
+66 2 441 5000 Fax: +66 2 441 9510

Water scarcity and quality problems in Chao Praya basin has led to a project diverting water from Mae Klong Basin to serve the population in Bangkok. For the government, the reason that this diversion has not been a problem thus far is because the Mae Klong River has a surplus of water which is drained into the ocean if it is not used. And diverting water has not reduced water consumption for Mae Klong water users.

But as for people in the Mae Klong basin, we found that most people did not know about this project, and people who have information feel concern about water scarcity; they do not think that the Mae Klong River has a surplus of water at present. In the future, the water demand along the Mae Klong increases or more water is needed. Diverting the water will surely create more conflict between the water users. This is one case which illustrates a conflict related to scarcity in water resource allocation in Thailand because of seemingly unfair water allocation. People along the lower Mae Klong River have to make sacrifices without any compensation being made.

The purpose of this study is to assess health impact. The study will be an approach based on recognition of rights with participatory process. Assessment of impact might be developed as a tool for future planning and decision-making in the similar project. The results, such as negative impact on health status, should be minimized through appropriate mitigation. We chose Samut Songkram province for the area

study because this province is at the mouth of the Mae Klong River. The results from expert meetings were documented for the last stakeholders meeting that 46 indicators in 4 dimensions (Physical, Mental, Social and Spiritual Health) were introduced.

Key words: *health impact assessment, water scarcity, diverting water*

INTEGRATION OF SEA WITH URBAN AND REGIONAL PLANNING RELATED TO TOTAL POLLUTION LOAD MANAGEMENT SYSTEM IN KOREA

Lee, Jong Ho
Department of Urban and Regional Planning
Chongju University
#36 Naedok-Dong Sangdang-Gu
Chongju, Chungbuk, 360-764, Republic of Korea
+82 43 229 8279 Fax: +82 43 229 8233
jhlee1013@chongju.ac.kr

Kim, Tae Geun
Department of Environmental Engineering
Chongju University
+82 43 229 8575 Fax: +82 43 229 8432
ktkenv@chongju.ac.kr

The total pollution load management system (TPLMS) of four large major rivers in Korea has been implemented upon Act relating to Water Resources in Han River and Community Support, Special Act on Nakdong River's Watershed Management, Special Act on Geum River's Watershed Management and Special Act on Yeongsan and Seomjin River's Watershed Management since 2002.

TPLMS is the system for the reduction of pollution loading of existing and new pollutant sources and urban and regional development planning. The allocation of pollution loading to local government, groups of major pollutant sources, and individual pollutant sources is carried out based on water quality modeling. The content of master plan and implementation plan of TPLMS is also included in the sewage treatment plan of local government. Therefore TPLMS could be applied as the application technique of SEA.

EIA based on Environmental Impact Assessment Act on Environment, Transportation and Natural Disaster is the system, where the impact of the large scale development project is predicted and assessed, and the alternatives for the abatement of adverse impact is also suggested.

The Pre-Environmental Assessment (EA) based on Basic Environmental Policy Act has similar concept of SEA and EIA, because it predicts and assesses the environmental impact of administration plan and the small-scale development project in environmentally sensitive region.

Therefore, the contents of EIA, Pre-EA, development planning and sewage treatment plan, which are being implemented separately or independently but have similar purposes, could be overlapped and at sometimes bring about inconsistency among them.

This study suggests the integration of SEA and urban and regional planning under the control of TPLMS, and the integration of SEA, EIA, and Pre-EA toward integrated EIA system.

Key words: *Total Pollution Load Management System (TPLMS)), environmental impact assessment, EIA, strategic environmental assessment, SEA*

REDESIGNING THE ENVIRONMENTAL ASSESSMENT SYSTEM OF KOREA

Song, Young-Il
Korea Environment Institute
613-2 Bulgwang-dong, Eunpyeong-gu
Seoul N/A 122-706 Korea
+82 2 380 7674 Fax: +82 2 380 7744
yisong@kei.re.kr • www.kei.re.kr

Lee, Hyun-Woo
Korea Environment Institute
+82 2 380 7768 Fax: +82 2 380 7744
hwlee@kei.re.kr

Lee, Young-Joon
Korea Environment Institute
+82 2 380 7763 Fax: +82 2 380 7744
yjlee@kei.re.kr

Joo, Yong-Joon
Korea Environment Institute
yjjoo@kei.re.kr

Choi, Joon-Gyu
Korea Environment Institute
jgchoi@kei.re.kr

Han, Sang-Wook
Kwangwoon University
447-1 Wolgye-Dong, Nowon-Gu
Seoul 139-701 Korea
swhan@hanmail.net

Since the late 1970s, Environmental Impact Assessment in Korea has played an important role in decision-making processes particularly for environmentally sensitive projects. However, the EIA system alone has sometimes not been so effective to ensure the successful resolution of environmental concerns. For instance, most of EIA are usually carried out after many important strategic decisions at the earlier stage have been made without any environmental consideration. Therefore, it is hard to cancel or change the project fundamentally even though environmentally big problems are found. In such cases, alternatives and mitigation measures are also very limited. In order to overcome such a limitation of the EIA system, a new assessment system called Preliminary

Environmental Review System (PERS), which is relevant to SEA in some aspects, was introduced in 1999 by an amendment of the Basic Environmental Policy Act (BEPA). The PERS aims to balance development and preservation by identifying possible environmental impacts of some administrative plans mainly related to development projects in the early stages of planning. However, PERS has still appeared to have some weak points such as 1) a limited range of positive list and 2) weakness of tiering (or vertical integration) from PERS to EIA. This research analyzed the PERS in order to check out if it fully sustains certain SEA principles and performance criteria. In addition, a total of 106 administrative plans including the present 39 for PERS were thoroughly investigated. As a result, 89 of them were selected for a future consideration when redesigning the environmental assessment system including their legal bases. It is also suggested that BEPA and EIA laws would be amended for the new EA system.

Key words: *Korea, preliminary environmental review system, SEA*

TOWARDS GUIDELINES FOR ANALYTIC SUPPORT IN MULTI-ACTOR SITUATIONS

Thissen, Wil
Delft University of Technology
Faculty TPM Jaffalaan 5
Delft, Zuid-Holland, The Netherlands
+31152786607 Fax: +31 152786439
thissen@tbm.tudelft.nl • www.tbm.tudelft.nl

The assumption that the scientific quality of information provided is the key factor in determining use of information by decision makers has been challenged by both practical experience as well as by theoretical arguments from human decision theory and the policy sciences. Other factors appear to have strong influence on the use of information decision making. This presentation will highlight some of the findings from two recent Ph D studies performed within the ongoing Multi-Actor Systems programme at Delft University of Technology. The studies focused on policy analysis in multi-actor situations, one of the studies concentrated on participative policy processes. In both studies, theoretical notions from a variety of literature sources were complemented by empirical case studies. Particular emphasis was on the valuation and use of analytic information by participants, including stakeholders and (public) decision makers The studies indicate the need for:

- Trustworthiness of the analysis
- Broadness and integration of information
- An explicit multi-actor focus, allowing for multiple perspectives, and giving due attention to the possibility of intertwining interests and compensation
- Access to and dosage of information
- Support of participants in participative settings
- Variety generation and creativity
- Clarity in procedures and processes

The presentation will elaborate on ways in which these needs may be fulfilled. The empirical part of the research indicates that not meeting these needs may lead to problems. It does, however, not provide conclusive evidence that meeting most of these needs guarantees success, or that ignoring some is a certain recipe for failure. Factors other than the kind of information, and the way in which it is provided, may play a dominant roles, such as political changes and external events.

Key words: *decision making, policy analysis, multi-actor systems*

APPLYING HEALTH IMPACT ASSESSMENT TO NATIONAL AGRICULTURAL POLICY: THE HEALTH IMPLICATIONS OF THE COMMON AGRICULTURAL POLICY IN A COUNTRY JOINING THE EUROPEAN UNION IN 2004

Lock, Karen
London School of Hygiene and Tropical Medicine
Keppel Street, London WC1E 7HT UK
+44 207 612 7810 Fax: +44 207 612 7812
karen.lock@lshtm.ac.uk • www.lshtm.ac.uk

Gabrijelcic, Mojca; Otorepec, Peter
Institute of Public Health
Trubarjeva 2
Ljubljana SI-1000 Slovenia
Mojca.Gabrijelcic@ivz-rs.si

Martuzzi, Marco
European Centre for Environment
and Health, WHO
Via Francesco Crispi, 10
Rome 00187 Italy
MAM@who.it

Robertson, Aileen
Nutrition and Food Safety Programme,
WHO Regional Office for Europe,
Scherfigsvej 8, Copenhagen DK-2100 Denmark
ARO@euro.who.int

Kuhar, Ales
Department of Agricultural Economics,
Policy and Law, University of Ljubljana
Ljubljana, Slovenia

Wallace, Paul
Department of Primary Care and
Population Sciences
University College
Rowland Hill Street, London NW3 2PF, UK

Dora, Carlos
World Health Organization
HIA Programme
Avenue Appia 20, CH 1211, Geneva 27, Switzerland

Maucec Zakotnik, Jozica
Ministry of Health
Stefanova 5, SI-1000, Ljubljana, Slovenia

This paper presents the results of an HIA of national agriculture policy completed by the Slovenian Government in November 2003. In May 2004 Slovenia will join the EU and is required to adopt EU law. The EU Common Agricultural Policy (CAP) accounts for nearly 50% of the EU budget and consists of vast amounts of inflexible legislation which has no public health consideration. The HIA basically followed a six-stage process, policy analysis, rapid appraisal workshops with stakeholders, review of evidence relevant to agricultural, analysis of Slovenian health-related indicators, a report on the findings presented to parliament in November 2003, and evaluation. The results of the HIA were fed into the government policy process as part of the ongoing development of the inter-sectoral National food and nutrition action plan. This paper will present the results and recommendations made to the government of Slovenia for specific agricultural sectors including fruit and vegetable, dairy and wine regimes, and rural development policy. The focus is how CAP policy can be used to promote production which improves public health. E.g, Slovenians currently only consume 75% of the WHO recommended intake of fruit and vegetables, and only 60% consumed are grown in Slovenia. There is opportunity to increase consumption and market sector for horticulture, having health benefits by reducing cardio-vascular disease and cancer, and indirect effects on socio-economic status by preserving traditional farm livelihoods. Also current EU dairy policy will force Slovenia to increase the milk fat content of existing milk bought by consumers. The use of HIA in Slovenia has been a useful mechanism for raising broader public health issues on the agricultural policy agenda. The process has had positive impacts on inter-sectoral working, and is seen as a useful tool for embedding public health across policy sectors.

Key words: *health impact assessment, agriculture, policy*

ROLES OF HEALTH IMPACT ASSESSMENT AND THE POTASH MINING PROJECT

Kessomboon, Nusaraporn
Faculty of Pharmaceutical Sciences
Khon Kaen University
Khon Kaen 40002 Thailand
+ 66 43 202378 Fax: +66 43 202379
nustat@kku.ac.th

Kessomboon, Pattapong
Faculty of Medicine
Khon Kaen University
Khon Kaen 40002 Thailand
pattapong@hotmail.com

Thai people and the environment have been suffering due to development projects for a long time. "Health Impact Assessment" is one of social innovations that can prevent and mitigate such problems.

The Potash Mining Project in Udorn Thani Province: High quality potash has been discovered in Udorn Thani since 1981. The Asia Pacific Potash Corporation (APPC) has planned to invest around $US 64.5 millions on the mine. A 320 hectare-size plot of land has been purchased for the buildings of the plant. Expectedly, 5 millions of the remnants of Potash salts will be carried back into the underground and take around 22 years to finish. A number of meetings and public hearings have been organized by the protesters. Pitfalls in the EIA report and unfair agreement in the contract were the major arguments. People in the mining areas have been separated into two opposite sides.
Roles of Health Impact Assessment : The HIA working group of the Health Systems Research Institute has joined the Udorn Thani working group to organize a seminar on "The Application of Health Impact Assessment Process" on 17-18 May 2003. There were around 500 participants. The seminar processes consisted of lectures from academics, APPC, Human Right Committee and small-group brainstorming sessions to listen to voices of health concerns among participants. Afterwards, the Minister of Natural Resources and Environment has directed his staff to study the seminar documents. On 3 June 2003, the committee of experts in environment reconsidering the EIA report has concluded that the EIA report has a numbers of major mistakes and was not suitable for the permission process. Seminars and public hearings in communities both rural and urban have still been organized regularly. Bringing "Health Values" to the debates about development is strongly beneficial. The approach can be leading to sustainable development.

Key words: health impact assessment, potash, mining, Thailand

INTEGRATED POLLUTION PREVENTION AND CONTROL (IPPC): AN INSIGHT INTO THE EXPERIENCE OF HEALTH AUTHORITIES IN THE NORTHERN AND YORKSHIRE AREA OF THE NORTH EAST OF ENGLAND

Ahmad, Balsam
IPPC
Yorkshire IPPC Support Unit
School of Population and Health Sciences
The Medical School
University of Newcastle Upon Tyne
Newcastle Upon Tyne, NE2 4HH UK
+44 191 222 5100 Fax: +44 191 222 8211
balsam.ahmad@ncl.ac.uk

Lanser, Shelley
Regional Environmental Epidemiologist
Health Protection Agency, North East
North Corridor, Floor E, Milburn House, Dean Street
Newcastle Upon Tyne, NE1 1LF UK
+44 191 261 2577 Fax: +44 191 261 2578
Shelley.Lanser@hpa.org.uk • s.j.lanser@ncl.ac.uk

Pless-Mulloli, Tanja
School of Population and Health Sciences

The Medical School
University of Newcastle Upon Tyne
Newcastle Upon Tyne, NE2 4HH UK
+44 191 222 7211 Fax: +44 191 222 8211
Tanja.Pless-Mulloli@ncl.ac.uk

Vizard, Catherine
Yorkshire IPPC Support Unit
School of Population and Health Sciences
The Medical School
University of Newcastle Upon Tyne
Newcastle Upon Tyne, NE2 4HH UK
+44 191 222 5673 Fax: +44 191 222 8211
c.g.vizard@ncl.ac.uk

Following the implementation of the Pollution Prevention and Control Regulations on 1st August 2000, health authorities in England and Wales became statutory consultees for permits issued to industry by the environmental regulator (i.e. the Environmental Agency or the Local Authority). In this paper we describe the practice of providing public health input into the Integrated Pollution Prevention and Control (IPPC) regime by using the experience of the Northern and Yorkshire health authorities in the North East of England. So far these authorities have responded to approximately sixty applications from industries ranging from waste management installations to chemical plants. Additionally, we identify the benefits and value added of consulting health authorities in IPPC as well as the opportunities in this practice to learn from statutory consultations in Environmental Impact Assessment. We also describe the constraints that currently face the effectiveness of public health input to the IPPC process for permitting potentially polluting industries. These include, but are not exclusive to, limited capacity and capability of health authorities, lack of the evidence base and limited understanding of the different institutional roles in the IPPC process. Finally, we recommend measures to improve the effectiveness of the public health input to the IPPC process.

Key words: *integrated pollution prevention and control (IPPC), industries, public health, North-East, England*

STRATEGIC COMMUNICATION FOR IMPACT ASSESSMENT: LESSONS LEARNED FROM THE IAIA'03 MARRAKECH PRACTITIONER'S FORUM AND REVIEW OF SELECTED RECENT EXPERIENCES

Leonard, Peter
Hydro Québec Production
75 Blvd René-Lévesque West, Montréal, H2Z 1A4 Canada
+1 514 289 2211 ext. 4282
leonard.peter@hydro.qc.ca

Santi, Emanuele
World Bank
Washington, DC, 20433 USA
+1 202 473 2281
esanti@worldbank.org

At the 2003 Annual Meeting of the International Association for Impact assessment in Marrakech practitioners forum different organizations and civil servants from both the developed and developing countries gathered to discuss the role of communications for impact assessment of policies, programs and projects. The purpose of this paper is to present the outcome of that discussion and corroborating it with a selected literature review of documented experiences on the topic.

Communications has been recognized as playing a key role in the different stages of an investment cycle, therefore having a strong impact on how an investment is perceived by the different stakeholders. It has evolved towards a process that can be characterized as a two-way flow of information providing consensus building and facilitating the decision making process, rather than a marketing tool to "sell" the investment to unaware audiences.

The paper reviews several areas of intervention of communication, ranging from the use of communication research and techniques as a key analytical component of impact assessment, to the continuous efforts to nurturing the participatory process around the investment decision - in the decision making process - and its implementation. Good communication also becomes a major tool to make policy, programs and projects more efficient in answering the real development needs of communities - according to their own reality - while at the same time making decisions more consensual and sustainable.

The paper also reviews some case studies and practical experiences from the private sector and the public sector, with emphasis in developing countries, highlighting the major lessons learned on the issue.

Key words: *risk communication, public participation, impact assessment*

THE DIDACTICS OF EIA

Lundström , Stina; Olausson, Inger
Swedish EIA Centre
Box 7012, SE-75007 Uppsala, Sweden
+46 18 67 19 57, +46 18 67 26 62
Fax: +46 18 67 35 63
stina.lundstrom@lpul.slu.se
inger.olausson@lpul.slu.se
www-mkb.slu.se

The EIA practice is the same in all countries, but this study's hypothesis is that education and learning differs even though the goal is the same; the students should conduct good EIAs after their training. We should learn from each other's education methods as well as differences and similarities with the aim to improve the quality of EIA.

The quality of the EIAs made in Sweden varies greatly. Sometimes the process is well accomplished and only the most relevant impacts are included in the EIA-document, but

not too infrequently the quality is low and the quantity of pages is unnecessarily high. There might be different reasons for low quality and one identified reason is that the EIA competence among EIA consultancies could be improved. One way to handle this problem is to improve the EIA education.

Different universities and other education institutions have different items included in the EIA courses and the emphasis is put on different aspects. Some trainers are more theoretical while others have a more practical approach with for example real case studies used in the classroom.

To improve the EIA education in Sweden, the Swedish EIA Centre has made an inventory of the need for further education for EIA teachers at the different Swedish universities. Teachers at 23 universities have joined a network and are regularly getting updated information from the EIA Centre and are offered seminars and further education.

Another part of the project is an ongoing study on the didactics of EIA, i.e., how the teaching and learning of EIA functions in different countries. By interviewing teachers from other countries we will get a number of examples on how EIA education could be run. These case studies will give an input to improve the EIA education in Sweden.

Key words: *didactics, EIA, network, education, Sweden*

INCORPORATING SUSTAINABILITY INTO ENVIRONMENTAL IMPACT ASSESSMENT: A CASE STUDY OF THE VANCOUVER 2010 OLYMPIC AND PARALYMPIC WINTER GAMES

Bekhuys, Timothy J.
AMEC Earth & Environmental
2227 Douglas Road, Burnaby, BC V5C 5A9 Canada
+1 604 294 3811 Fax: +1 604 294 4664
tim.bekhuys@amec.com • www: http://www.amec.com

McKay, George
Vancouver 2010
PO Box 9475, Stn Prov Gov't
Victoria, BC V8W 9W6 Canada
+1 250 387 1730 Fax: +1 250 889 1828
George.McKay@gems1.gov.bc.ca

In July of 2003, Vancouver, British Columbia won the right to host the 2010 Olympic and Paralympic Winter Games. The games are to be held during February and March of 2010 in Vancouver and Whistler, B.C. and will include development of 14 venues. This will include re-development of old facilities and creation of new ones. It is expected to generate significant capital investment and people from all parts of the globe are expected to watch the games. The vision is to "Create sustainable legacies for athletes and sport development, our host communities, our province, our country and the global Olympic Family by hosting and outstanding Olympic Winter and Winter Paralympic Winter Games."

As part of the successful bid for the games, the Vancouver 2010 Bid Corporation committed to developing the Bid and venues and hosting the games in an environmentally and socially responsible manner. This included completing an environmental impact assessment with a framework and lens for assessing sustainability. The assessment examined three primary aspects of sustainability: environment stewardship, social responsibility and economic opportunity. The assessment also examined how venue development could meet these commitments.

From this assessment and commitments made to the IOC, a series of systems and management plans are being developed. These include: detailed Environmental Impact Assessment of key venues in the Callaghan Valley, Cypress and Whistler, a Sustainability Management System, Sustainable Energy Management, Sustainability Procurement Polices and Green Building Design criteria.

The intent is to create an Olympic environmental legacy, both for the citizens of Canada and the IOC.

Key words: *environmental impact, sustainability,Olympics, Vancouver, Whistler*

WHAT MAKES RISK ANALYSIS A SUCCESSFUL BUSINESS. CAN LESSONS FOR IMPACT ASSESSMENT BE LEARNED?

Attlan, Jean-Michel
Investment Support Group
International Finance Corporation
Room F 3P-238, 2121 Pennsylvannia Avenue NW
Washington, DC 20433 USA
+1 202 473 8132
jattlan@ifc.org

Mercier, Jean-Roger
Environmental Assessment
Quality Assurance and Compliance Unit (ESDQC)
World Bank
Room MC5-135, 1818 H Street NW
Washington DC 20433 USA
+1 202 473 5565 Fax: +1202 477 0565
jmercier@worldbank.org
http://www.worldbank.org/environmentalassessment
http://www.worldbank.org/sea
http://www.worldbank.org/safeguards

Morgan, Glenn
East Asia and Pacific Environmentally & Socially Sustainable Development
World Bank
Room MC8-239, 1818 H Street NW
Washington DC 20433 USA
+1 202 458 1909
gmorgan@worldbank.org

Like in any other service industry, Impact Assessment (IA) professionals deliver services to clients. In current IA practice, these services are heavily biased to the feasibility and design stages of an investment. However, it is increasingly acknowledged that unless the results of conventional IA carry over into investment implementation, its value is reduced. There is a recognition that services provided by impact assessment professionals are sub-optimal in this respect and, therefore, limited in their potential contribution to development impact.

There is an increasing interest in addressing the challenges of moving from Impact Assessment (perceived as one-off, static, reactive view) to Impact Management (continuous process, dynamic, proactive approach) using risk analysis as a core concept. Current IA practice tends to focus on known or readily identifiable impacts. However, there is a recognition that conventional IA is limited in the extent to which it is used to evaluate and respond to future risks which emerge during project implementation.

This paper examines lessons learned from the risk analysis and risk management industry (i.e., insurance professionals) in order to identify potential strategies to help move from Impact Assessment to Impact Management. In order to derive lessons from industry approaches, the paper analyzes some of the characteristics of risk analysis (RA) as practiced in these industries in order to understand what makes RA so successful and so integral to current business practices. The paper analyzes various institutional mechanisms to build such incentives and some advanced approaches where Impact Assessment has been directly linked to its follow-up.

The insurance industry, a multi-billion conglomerate of huge and smaller companies, some international, some local, thrives on risk analysis. The "aspirating pump" of risk analysis creates the financial incentives and the conditions for excellence and for the constant quest for improved methodological approaches and tools. Laying out these features will help determine out how new and better bridges could be built between the communities dealing with IA and RA.

Key words: *impact assessment, risk analysis, business of impact assessment, interfacing IA and RA*

TECHNOLOGY ASSESSMENT - A FRAMEWORK FOR COMBINATION OF TOOLS

Assefa, Getachew
Royal Institute of Technology
Osquars Backe 7, Stockholm 100 44 Sweden
+46 8 7909331 Fax: +46 790 5034
getachew@ket.kth.se
www.ima.kth.se

In line with the need to live up to the requirements of the notion of sustainable development, a framework for assessment of the ecological, economic and social impacts of technologies is necessary. Technology is defined in terms of man's interference on natural mass and energy flows. The material flows are mainly related to the carbon, nitrogen, sulfur and phosphorus flows. In the paper the combination of different systems analysis tools within the framework for technology assessment is advocated. Tools such as material flow analysis, life cycle assessment, life cycle costing and social impact assessment work under the same platform. This gives the possibility for interdisciplinary fertilization of knowledge. The impact of the technology can be assessed at various phases of its maturity depending on the purpose of the assessment and the end-user of the information processed. The framework for technology assessment is for implementation in a computer based tool. The tool uses qualitative and quantitative data from participatory consultation of stakeholders both as a raw input and as background information for final analysis of results. It is composed of three parts namely data input, data processing and result presentation parts. Modular feature of the tool offers flexibility, tra nsparency and simplicity. Besides it has the advantage of making more even-handed assessment in comparison what has been featured by conventional technology assessment. Further development is required with regard to the weighting of different aspects within the ecological and social dimension of the assessment and a comparative analysis of the results from these two as well as the economic part.

Key words: *technology assessment, material flow analysis, life cycle assessment, life cycle costing*

IMPACT ASSESSMENT AND INTERNATIONAL FINANCE

Neame, Peter A.
Environment and Social
Development Department
+1 202 473 1564 Fax: +1 202 974 4351
pneame@ifc.org

Increasingly, international financial institutions are using the instrument of environmental and social impact assessment (IA) to manage environmental and social risk on projects they finance as well as to improve investment quality and sustainability. For multilateral and bilateral development finance institutions, export credit agencies and commercial banks, impact assessment is becoming integral to prudent project financing.

Since June 2003, 19 of the largest commercial banks, involved in over 74% of international development lending, have adopted the Equator Principles, which commits them to:

- Screen and categorize projects for environmental and social risks
- Assess social and environmental impacts accordingly
- Manage potential impacts pro-actively and transparently
- Covenant environmental and social requirements in loan documentation

Policies and procedures under the Equator Principles have been adopted from the environmental and social review process established by the International Finance Corporation (IFC)-the private sector arm of the World Bank Group. Similarly, export credit agencies which are members of the Export Credits Group of the Organisation for Economic Co-operation and Development (OECD) have agreed on the "Common Approaches on Environment and Officially Supported Export Credits." requiring each export credit agency to apply the same environmental requirements to their investments. As well, the multi-lateral development finance institutions are also working to harmonize their environmental and social assessment requirements.

This Theme Forum will be one of the first international events to focus specifically on the use of impact assessment by the international finance community. It will be an important opportunity for international finance and impact assessment practitioners to meet, to share experiences, and to learn how these new initiatives are unfolding.

Topics in this Theme Forum will include the latest information on the application of the Equator Principles, the status and future of the OECD's "Common Approaches on the Environment," financial institution processes for implementing IA, integrating IA into financial decision-making, the corporate reputational benefits of IA, and IA as a financial risk management tool.

ENVIRONMENTAL FOLLOW-UP OF OPERATION AND MAINTENANCE OF RAILWAY INFRASTRUCTURE IN SWEDEN AND SOME OTHER COUNTRIES

Lundberg, Kristina
KTH
Brinellvägen 28 Department of Land- and Water Resources Engineering
Stockholm SE - 100 44 Sweden
+46 8 790 61 41 Fax: +46 8 411 07 75
krilun@kth.se • www.lwr.kth.se

Ongoing follow-up and continual improvements are basic components of environmental management systems (EMS). Nevertheless, the contribution of EMS to increased environmental performance is widely debated. For example, implementation of EMS sometimes tends to take the focus away from actual improvements of the environmental performance. Furthermore, according to the international standard ISO 14001, continual improvement is only required for the significant environmental aspects identified by the organisations. That is, the standard stipulates nothing about the total environmental impact of the organisation's activities as a whole.

In Sweden, some central authorities have a special responsibility for their own sectors and need to be proactive in their environmental commitment. Banverket (Swedish National Rail Agency) is responsible for the Swedish railway sector and is hence responsible for the achievement of ecological sustainability of the Swedish rail transport system. This responsibility implies an active commitment to continually improve the environmental performance of the organisation. A well functioning environmental follow-up program is therefore essential.

A case study has been initiated to evaluate Banverket's present program for follow-up of its operation and maintenance activities. The study aims to increase the effectiveness of the environmental follow-up of operation and maintenance of the rail infrastructure and hence increase the environmental performance of Banverket. In order to compare Banverket's follow-up activities with other rail administrations, a questionnaire was sent to rail administrations in 22 foreign countries. In this contribution, preliminary results of the case study are presented. The focus is on the structure of Banverket's follow-up program in relation to international experience as well as on indicators used to follow-up operation and maintenance activities.

Key words: *follow up, environmental performance, railways, EMS*

ECOPHYSIOGRAPHIC STUDY AS THE BASIS FOR A RATIONAL SPATIAL PLANNING

Kowalczyk, Ryszard
Ecoplan Poland
45-316 OPOLE, ul.Rzeszowska 11 Poland
+48 77 4558950 Fax: +48 77 4558950
biuro@ecoplan.pl • www.ecoplan.pl

Kowalczyk, Jaroslaw
Ecoplan Poland
+48 77 4566516 • +48 77 4566516
jk@ecoplan.pl

The ecophysiographic study has been obligatorily executed under the procedure of area development planning. The documents are prepared both for the local plans as well as for the voivodeship area development planning. The Ecophysiographic study contains an evaluation of the state of the particular items of the environment including the geological, water, soil, lanscape and climate evaluation etc.and the evaluation of their usefulness for the development of specific functions such as construction, recreation, services etc.

Apart from that specification of the state of the threat for the environment constitutes the subject of the ecophysiographic studies - noise, pollution of the air water, soil degradation etc. Depending on the level of the threat for the environment instructions are formulated for the function and area solutions in the projects of the area development planning. According to the regulations in force the ecophysiographic elaboration is prepared separately for every plan of the area development and it has to be established before the commencement of the work on the plan. In order to provide sufficient level of detail of the information about

the environment and its threats, the ecophysiographic study is executed in the same scale as the area development plan.

As the plans constitute documents of local law they are the basis for future administrative decisions, i.e. decisions on the conditions of the construction, on the locality of the investment the study of the particular items of the environment especially measurement of noise, air pollution soil pollution etc. have to be executed according to the reference methodology established by the Ministry of Environment. It assures proper quality of information about the environment, and in this way allows specifying the requirements of the environment protection in the plan properly.

The information about the environment must be also included in the report of the impact of the planned project on the environment. The obligation results from a proper decision of the Ministry of Environment, which refers to the establishment of strategic evaluations of the impact of the area development on the environment. A formal system of public documents has been established and it is used in the process concerning the evaluation of impact on the environment with participation of the communities consisting of : design of the area development, report of its impact on the environment and the ecophysiographic study concerning the area for which the project has been established.

Key words: *spatial planning, ecophysiographic study*

GRASS GIS APPLICATION IN SOUNDSCAPE QUALITY EVALUATION FOR ECOPHYSIOGRAPHIC STUDY PURPOSES

Kowalczyk, Ryszard
Ecoplan Poland
45-316 OPOLE, ul.Rzeszowska 11 Poland
+48 77 4558950 Fax: +48 77 4558950
biuro@ecoplan.pl • www.ecoplan.pl

Kowalczyk, Jaroslaw
Ecoplan Poland
+48 77 4566516 Fax: +48 77 4566516
jk@ecoplan.pl

Ecophysiographic studies constitute vital element in polish spatial planning system. Their purpose is to deliver basic information on space which final use will be determined by spatial plan. In this article we try to present methodology used in several ecophysiographic studies carried out by our team - creating information layer characterizing soundscape quality with GRASS GIS.

Evaluating of soundscape quality within ecophysiographic studies is a task completely different form carrying out typical city acoustic map, basically because of array of differences in the goals that those documents have to serve, and data detail level that authors can access.

Main points touched in this paper are:

- place of ecophysiographic studies in noise environment protection
- opportunity to solve spatial conflicts resulting form acoustic nuisances at the very early stage of environment collecting of noise nuisances data in field
- environmental noise measurement rules in Poland, and their compatibility with EU directives initial measurement data analysis and other information allowing to describe noise nuisance sources more precisely.
- preparing raster data layers for GRASS analysis- using topographic maps
- and aerial photography to extract required data
- environmental noise propagation model - description of the basic factors
- determining propagation of noise in an environment based on ISO 9613 Standard
- noise propagation model implementation in GRASS GIS - application of
- raster analysis modules in noise propagation calculation, limitations
- imposed by used GRASS GIS data structures in implementing all rules
- governing noise propagation
- model verification based on field noise measurements
- modeling results visualization in GRASS
- further development directions
- case studies

GRASS GIS is a full-featured raster Geographic Information System with vector analysis support. It gives users different spatial analysis tools that can be used not only at noise propagation modeling stage, but later also, especially in further analysis of nuisances in relation to other spatial data. In the paper we describe the way we have developed map with zones indicating required noise protection based on norms and acts of building acoustics and environmental acoustics.

Key words: *GIS, grass, noise, ecophysiographic study*

ASSESSMENT OF THE IMPACT OF THE STRATEGY OF INFRASTRUCTURE DEVELOPMENT IN THE OPOLE VOIVODESHIP BETWEEN 2003 AND 2008 ON THE ENVIRONMENT AS AN EXAMPLE OF MEETING THE REQUIREMENTS OF THE "STRATEGIC DIRECTIVE" OF THE EUROPEAN COMMUNITY

Kowalczyk, Ryszard
Ecoplan Poland
45-316 OPOLE, ul.Rzeszowska 11 Poland
+48 77 4558950 Fax: +48 77 4558950
biuro@ecoplan.pl • www.ecoplan.pl

Stefaniak, Zdzislaw
45-264 Opole, Puzaka 48c/5 Street, Poland

+48 77 4027785 Fax: +48 77 4027785
stef@op.onet.pl

Szymanski, Grzegorz; Kichman, Jacek
Office of the Opolskie Marshal Voivodeship
Department of Infrastructure and Economy
45-082 Opole, Piastowska 14 Street, Poland
+48 77 4524404
dig@umwo.opole.pl
j.kichman@umwo.opole.pl

The public document called Strategy of infrastructure development in the Opole Voivodeship between 2003 and 2008, has been established by the Department of the Infrastructure and Local Development of the Marshall Office of the Opole Voivodeship. It specifies strategic and operative aims within the development of the infrastructure - roads, municipal and electric systems, in order to provide proper standard of living of the inhabitants, proper standards of road connections, railways, telecommunications systems, development of the air and water transport and to improve the state of the environment and provide electricity for the Voivodeship. The realization of the aims increases the attractiveness of the voivodeship for the investors, which in turn, facilitates the development of the local economy. The aims, indicated in the Strategy of development (...) are to integrate the activities of all units involved in the tasks related with the infrastructural development and they will influence obtaining of financial resources from, among others, the budget of the voivodeship self-government, contract between the government and regional organizations and from the
structural funds.

The strategic evaluation of the impact of the above mentioned document prepared by the local authorities on the environment has been established in accordance with the regulations of the Act dated 27.04.2001 Environment Protection Law, which includes formal regulations taking into account the requirements of the EU regulations i.e. the European SEA Directive. In the strategic evaluation of the environmental impact the specified aim and scope of the Strategy (...) includes characteristics of the main premises of the strategy of development of the infrastructure in the voivodeship and relates the strategy with other public documents - especially those which create the policy of a balanced development. Apart from that an analysis and evaluation of the state of the environment and its potential changes in case of no execution of the Strategy (...) has been carried out.

Besides, the state of the environment in the areas of the envisaged significant impact was subject of a detailed analysis and evaluation. Problems of the environment protection in areas of special value, related with mineral resources, landscape and ecological features have also been discussed. Finally, solutions were proposed, aiming at prevention, restrictions or a natural compensation of the negative impact on the environment resulting from the Strategy (...) and alternative solutions for the solutions included in the Strategy (...) were formulated.

Key words: *strategic environmental assessment, European SEA Directive*

PRACTICAL IMPLEMENTATION OF ENVIRONMENTAL LEGISLATION IN A FIRST/THIRD WORLD COUNTRY

Friend. J.F.C.
Environmental Engineering Group
South Campus, University of Pretoria
Pretoria, 0002 South Africa
+27 82 554 8900
ffriend@eng.up.ac.za
www.up.ac.za/academic/chemeng -
select Environmental Engineering

South Africa is a developing country with environmental constraints emanating from both its first and third world sectors. In order to address environmental impacts on the environment effectively, some form of legislative requirements must be met. Normally this can be achieved through the enforcement of adequate environmental legislation, and/or the use of voluntary approaches through working relationships between governments and industries. In South Africa, environmental legislation comparable to the best in the world has been in existence for a very long time. However, the country's inability to enforce current environmental legislation effectively (mostly through a lack of government capacity), results in detrimental impacts on the environment. The situation is exacerbated through the role played by the third world sector in areas where suitable enforcement of legislation may lead to additional unemployment to accommodate additional expenditures from industries having to meet (more) stringent environmental requirements. This scenario is not unlike in many African and other developing countries. This paper gives a brief outline of existing and anticipated environmental legislation in South Africa, dealing specifically with environmental impact assessments (EIAs). The actual enforcement and implementation of environmental legislative requirements in practice are addressed through typical examples from industry in the country. Finally, suitable legislative implementation and enforcement options are suggested and practical examples used to illustrate effective implementation of environmental programmes.

Key words: *legislation, environment, EIA*

PROMOTING SUSTAINABLE INFRASTRUCTURE DEVELOPMENT IN CANADA: SOME LESSONS LEARNED FROM PROJECTS SUPPORTED BY INFRASTRUCTURE CANADA

Grady, Keith
Infrastructure Canada
90 Sparks Street, Suite 606, Ottawa, ON K1P 5B4 Canada
+1 613 954 1372 Fax: +1 613 946 9888
grady.keith@infrastructure.gc.ca

Developed and developing countries, including Canada, face growing pressures to renew and expand public infrastructure, such as roads, water and wastewater treatment, solid waste disposal, buildings and amenities. For infrastructure development to fully contribute to improved quality of life and economic prosperity, it must be based on principles of environmental sustainability.

Infrastructure Canada, a recently created department of the Government of Canada, manages several national programs that deliver billions of dollars in new investment for sustainable economic growth in urban and rural communities across the country.

This paper examines several projects funded by Infrastructure Canada, including the Vancouver Convention Centre Expansion Project. Some "lessons learned" from environmental assessment and other review process are presented that have assisted the integration of environmental sustainability into project planning and decision-making.

This paper is one of three describing Infrastructure Canada's efforts to promote sustainable infrastructure development. The others describe the institutional context and the development of a program framework through which the department addresses its environmental sustainability objectives.

Key words: *infrastructure, environmental sustainability, Government of Canada, Infrastructure Canada*

DEVELOPMENTS IN EIA OF NATIONAL HIGHWAY SCHEMES IN THE UK

Kerwick-Chrisp, Dean
Highways Agency
49-53 Goldington Road
Bedford, Bedfordshire MK40 3LL England
+44 1234 796080 Fax: +44 1234 796155
kerwiad@highways.gsi.gov.uk

Chisholm, Amanda
Scottish Executive
Trunk Roads Design & Construction Div.
Victoria Quay
Edinburgh, Mid-Lothian EH6 6QQ Scotland
+44 131 244 7225 Fax: +44 131 244 7228
amanda.chisholm@scotland.gsi.gov.uk

The Design Manual for Roads and Bridges (DMRB) Volume 11 provides guidance on environmental assessment requirements for national highway schemes in the UK, combining procedural and technical advice. DMRB Volume 11 was first published in June 1993 with changes in August 1994. Air Quality and Water sections have been revised more recently. Users commended the document and it has had wide and positive application. Volume 11 is the definitive guidance on the environmental assessment of highway projects, but sections of the volume are dated and increasingly risk exposing the national road administrations to challenge. Much has been learned in the ten years of Volume 11's application. At the same time, there have been significant developments in the wider legislative and policy context. These include the introduction of EC Directive 97/11 and other European legislation, and the continuing evolution of good EIA practice. The 1990s saw the development of integrated transport project appraisal methodologies across the UK, where environment has equal prominence with safety, economy, accessibility and integration (inter alia the new approach to appraisal and Scottish Transport Appraisal Guidance). In addition, a greater diversity of project types is now promoted throughout the United Kingdom. Accordingly, Volume 11 is being updated and revised, to re-establish it as the definitive guidance on UK highway environmental assessment consistent with both the business needs of the national road administrations and the requirements of European policy guidance and legislation. The objective of this paper is to outline the emerging direction of Volume 11. The paper will describe the major lessons learned, provide details of the specific issues to be revised and/or updated, consider the developing requirement for flexibility in application and the need for integration with project appraisal, and finally set out brief examples of the range of applications to date.

Key words: *EIA, guidance, highways, transport project appraisal*

LES EFFETS STRUCTURANTS ET IMPACTS D'INFRASTRUCTURES ROUTIÈRES SUR LA MORPHOLOGIE URBAINE ET LES PAYSAGES : LE CAS DES ENTRÉES ROUTIÈRES À L'ÎLE DE MONTRÉAL

Gariépy, Michel; Lewis, Paul; Desjardins, Ludwig; Valois, Nicole
Institut d'urbanisme et Chaire en paysage et environnement
Université de Montréal
c.p.6128, Succursale Centre-ville
Montréal, QC H3C 3J7 Canada
+1 514 343 5980
michel.gariepy@umontreal.ca
paul.lewis@umontreal.ca
ludwig.desjardins@umontreal.ca
nicole.valois@umontreal.ca

Beaucoup de recherches se sont penchées sur l'implantation d'infrastructures de transport et leurs prétendus effets structurants sur les territoires. La plupart affirment qu'il n'existe pas de lien de causalité linéaire directe entre l'implantation d'une infrastructure et l'apparition d'effets au sein du territoire traversé : c'est plutôt une réalité complexe qui doit être saisie dans son ensemble, dans sa relation au cadre social, avec ses acteurs et leurs stratégies. Cependant, elles ont surtout adopté une approche économique, avec prédominance des dimensions régionale et interurbaine, comme les changements dans la répartition des activités économiques entre villes et régions , liés à la présence d'infrastructures. Elles traitent peu des impacts des routes sur des zones particulières et sur les paysages urbains. Par ailleurs, ces recherches sont essentiellement des évaluations faites a posteriori, ou ex post. Pourtant les études d'impact

ex ante tentent de prévoir l'impact des infrastructures sur le tissu urbain : l'impact est alors traité en termes de coupure, de vues bloquées et ouvertes, de secteur planifié adjacent à l'infrastructure, etc. Mais la dynamique de structuration mutuelle et à travers le temps des morphologies et des paysages ,d'un côté, et des infrastructures, de l'autre, est absente de l'analyse.

La communication présente les résultats d'une recherche commanditée par le Ministère des Transports du Québec sur les entrées routières à l'Île de Montréal et tente de déterminer comment ces entrées routières s'arriment et structurent le tissu urbain environnant. Elles sont découpées en parcours, sur la base des caractéristiques de leurs abords et du milieu traversé, tant au plan des morphologies architecturales et urbaines qui s'y retrouvent que de l'historique du développement. Les vues qui s'offrent aux conducteurs tout comme aux passagers sont décomposées et qualifiées. Une série de propositions sont mises de l'avant pour , d'un côté, pour corriger certaines situations problèmes et , de l'autre, apporter un appui méthodologique aux futures études d'impact d'infrastructures routières.

Mots clés: *autoroutes, entrées routières, effet structurant, impact, morphologies urbaines, paysages urbains*

LESSONS LEARNED FROM THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND MITIGATION PROCESS FOR THE BAKU-TBILISI-CEYHAN (BTC) OIL PIPELINE BETWEEN THE CASPIAN AND MEDITERRANEAN SEAS

Pollett, Edward (Ted)
International Finance Corporation
2121 Pennsylvania Ave. NW, Washington, DC 20433 USA
+1 202 473 2032 Fax: +1 202 974 4347
tpollett@ifc.org • www.ifc.org

Miller, Patricia
International Finance Corporation
+1 202 473 5971 Fax: +1 202 974 4347
pmiller@ifc.org

Miller, Shawn
International Finance Corporation
+1 202 473 1404 Fax: +1 202 974 4347
smiller1@ifc.org

A wide variety of complex and challenging issues were faced in the course of the environmental and social impact assessment and mitigation process for the Baku-Tbilisi-Ceyhan (BTC) pipeline, which will carry crude oil between the Caspian and Mediterranean Seas through Azerbaijan, Georgia and Turkey. The International Finance Corporation (IFC) worked closely with the sponsors and provided leadership in designing a framework and oversight mechanism for the development and operation of the project in an environmentally and socially sustainable manner. The 1760 km pipeline passes through a wide variety of agro-ecological areas and land use types and traverses over 17 700 parcels of land utilized by local households. Key issues include: severely limited regional routing options due to complex environmental, social and political constraints, very sensitive issues concerning possible impacts to unique flora and fauna habitats and to commercially utilized groundwater resources, a complicated land acquisition and compensation program required to address temporary impacts to livelihoods and activities (but no physical displacement) of a very large number of households, exacerbated by complex land tenure systems in all three countries, development of adequate mitigation measures and support for various marginalized and vulnerable groups, including ethnic minorities, women and the elderly, implementation of a major public consultation and disclosure program, and intense scrutiny by stakeholders, press and civil society, including international NGOs. The project has set new regional benchmarks in transparency, environmental and social standards and practices (including a regional review), enhancing development impacts though SME, community and environmental investment programs, implementation monitoring and increased constructive engagement with stakeholders. This paper focuses on the 'lessons learned' in conducting the impact assessment for the BTC pipeline and in developing a comprehensive Environmental and Social Action Plan (ESAP) which details how impacts will be avoided, mitigated or compensated and monitored.

Key words: *Baku-Tbilisi-Ceyhan (BTC) pipeline, environmental and social impact assessment*

THE CHANGE MANAGEMENT PROCEDURE: LESSONS LEARNED ON THE CHAD/CAMEROON OIL EXPORT PIPELINE PROJECT

Anderson, Ron
International Finance Corporation
2121 Pennsylvania Ave. NW, Washington, DC 20433 USA
+1 202 473 7953 Fax: +1 202 974 4351
roanderson@ifc.org • www.ifc.org

There is a tenuous link between the project description in Environmental and Social Impact Assessment (ESIA) and the "as built" project. Therefore, a mechanism is required to deal with the environmental and social realities of the "as built" project. One such mechanism is the Change Management Procedure. This paper analyzes the Change Management Procedure applied on the Chad/Cameroon Oil Export Pipeline project. The Change Management Procedure is analyzed from several perspectives: (i) the project developer and the financial institutions, (ii) the challenges when the regulatory conditions are weak/non-existent, (iii) operationalizing the Change Management Procedure, (iv) what works and what did not work, and (v) dealing with cumulative effects. The Paper concludes with "lessons learned" over the approximately three-year construction period for this project.

Key words: *Chad/Cameroon Oil Export Pipeline, change management procedure*

EFFECTIVE PROJECT BASED CONSULTATION WITH FIRST NATIONS

Meadows, George
Hemmera
1190 Hornby St Suite 350
Vancouver, BC V6Z 2K5 Canada
+1 250 881 0795 Fax: +1 604 669 0430
gmeadows@hemmera.com • www.hemmera.com

Engaging First Nations in Effective Project Based Consultation The proposed paper will provide an overview of key aspects of engaging First Nations in effective consultation processes within the context of relatively large transportation infrastructure projects subject to the federal and/or the provincial environmental assessment processes within British Columbia. The paper will discuss consultation within the context of recent changes to both the federal and provincial EA processes in British Columbia. These regulatory changes, in combination with the legal and policy changes brought about by recent case law in Haida and Taku will continue to have a fundamental bearing on the conduct of EA in British Columbia for the foreseeable future. These changes to the application of EA within BC also raise several challenges for project proponents and government regulators in meeting legal/policy obligations to consult with First Nations while at the same time adhering to project priorities, timelines and budgets. This must necessarily be balanced with the very real need to address First Nations needs and interests regarding consultation in a manner that is consistent with the principles set out by the courts and government policy. What this calls for is the establishment of positive working relationships with First Nations that engages them in a substantive way in the project planning, design and review phases of project development. This in turn can raise issues with respect to human resource and financial capacity, and project delivery/approval timelines that present challenges for First Nations, project proponents and government regulators. Within that context, the paper will discuss the following issues: · The basis of the obligation to consult · Implementing consultation within the context of EA generally, and the CEAA and BCEAA more specifically · Consultation Principles or "Best Practices" for engaging First Nations communities in effective project based consultations.

Key words: *First Nations, consultation, environmental assessment*

CUMULATIVE EFFECT ASSESSMENT FOR PRIVATE SECTOR PROJECTS

Athie, Mauricio
International Finance Corporation
2121 Pennsylvania Ave. NW, Washington, DC 20433 USA
+1 202 458 2640 Fax: +1 202 974 4347
mathie@ifc.org • www.ifc.org

The International Finance Corporation (IFC) is the private arm of the World Bank Group. IFC finances private projects in emerging markets where other financial sources are often unavailable because of potential risks associated with the country or with the project itself. There are numerous instances when IFC considers a prospective project sited in an area already populated by other industries or when a company significantly expands its operations in one area. In these cases IFC requires that a cumulative effects assessment be undertaken. To ensure that IFC-financed projects are implemented with due consideration to the surrounding environment and communities, IFC has developed and systematically applies a number of policies and guidelines that cover potential environmental, health, safety and social issues. IFC's procedure for environmental and social review of projects highlights the need to assess the "cumulative impact of a proposed project and other developments which are anticipated". However, IFC documentation offers no official guidance on how to undertake a cumulative effects analysis. IFC is currently using, on a case-by-case basis, a general CEA guidance note originally prepared for the review of mining and metallurgical projects. It was developed taking into account information provided by specialized publications and IFC's own experience in dealing with large and complicated projects. While this guidance note has been applied successfully in the appraisal of several projects, the author acknowledges that more comprehensive instructions may be necessary. This paper presents an updated version of the CEA guidance note and examples of its use in IFC-financed projects. As IFC is currently developing further guidance on cumulative effects assessment, the author welcomes comments and recommendations. We hope that IFC's efforts in this area may contribute to build impact assessment capacity in emerging markets.

Key words: *cumulative effects assessment, SEA, International Finance Corporation, IFC*

ACHIEVING REGIONAL SUSTAINABILITY: THE EVOLUTION OF MINE CLOSURE PLANNING IN THE SASKATCHEWAN URANIUM INDUSTRY

Barsi, Ron
Golder Associates Ltd.
145 1st Ave. North Suite 200
Saskatoon, SK S7K 1W6 Canada
+1 306 667 1257 Fax: +1 306 665 3342
ron_barsi@golder.com

Misfeldt, Greg
Golder Associates Ltd.
+1 306 667 1258 Fax: +1 306 665 3342
greg_misfeldt@golder.com

Jarrell, John
Cameco Corporation
2121 - 11th Street West
Saskatoon, SK S7M 1J3 Canada
+1 306 956 6488 Fax: +1 306 956 6533
john_jarrell@cameco.com

Pollock, Bob
Cogema Resources Inc.

P.O. Box 9204 817 - 45th Street West
Saskatoon, SK S7K 3X5 Canada
+1 306 343 4548 Fax: +1 306 343 4640
bob.pollock@cogema.ca

Uranium production in Saskatchewan began in 1953 and has since grown to be the world leading supplier of this energy product. Given the remote location of potential ore bodies, incredible advances were made in mineral exploration and the establishment of mining, milling and transportation infrastructure. Site planning did not include environmental assessment or public involvement. There was minimal to no regulatory controls, and definitely no closure planning. Even financial considerations were secondary, given the strategic importance of uranium at that point in history. Production wastes were routinely dumped on surface or in lakes. Each major operation had an associated town. Ore depletion lead to site abandonment with no decommissioning. This approach has left a legacy with significant environmental and social implications that are being grappled with to this day. In the early days, uranium ore grades were often 0.05% U3O8. Exploration in the early 80's, revealed extensive high grade uranium deposits often exceeding 20+% U3O8. This vaulted Saskatchewan into a leadership role in energy production. This realization presented a number of environmental, occupational health and safety, social and financial challenges. Consequently the industry and the governments of the day rose to the challenge, and initiated a number of initiatives that continue to evolve. This paper will discuss the evolution of sustainable development thought and practice within Saskatchewan's uranium industry. The environmental, social and economic pillars of regional sustainable development will be explored from the perspective of "designing" for site closure. The fundamental components of this approach will be detailed and examples of success shown. The paper will demonstrate that Saskatchewan's uranium industry has learned from past events, and with a strong sense of environmental and community responsibility, has assumed a leadership role on the world stage with regard to closure planning, progressive decommissioning and community involvement.

Key words: *mine closure planning, sustainable development*

TOWARD GUIDELINES FOR PUBLIC PARTICIPATION BEST PRACTICE PRINCIPLES

André, Pierre
Dept. Geography, Université de Montréal
C.P. 6128, Succ. Centre-ville
Montreal, QC H3C 3J7 Canada
+1 514 343 8051 Fax: +1 514 343 8008
pierre.andre@umontreal.ca

Enserink, Bert
Faculty of Technology, Policy and Management
Delft University of Technology (TUDelft)
PO Box 5015, 2600 GA Delft, The Netherlands
b.enserink@tbm.tudelft.nl

Connor, Des
Connor Development Services Ltd.
5096 Catalina Terrace, Victoria, BC V8Y 2A5 Canada
connor@connor.bc.ca

Croal, Peter
Southern African Institute for Environmental Assessment
P.O. Box 6322, Ausspannplatz, Windhoek, Namibia
peterc@saiea.com

As the premier organization in the field of environmental assessment (EA), IAIA is expected to play a leading and proactive role in the improvement and dissemination of EA concepts and practices, including Public Participation (PP), one of the basic principles of EA. The PP Best Practice document (under-development) is designed primarily for reference and use by those professionally involved in public participation within the context of EA. It promotes the effective practice of public participation, consistent with the institutional and process arrangements that are in force in different countries and organizations (e.g. World Bank), as well as internationally (e.g. Aarhus Convention). Three groups of principles will be presented and discussed: Basic Principles which apply to all stages of PP in EA process from strategic level to operational level, Operating Principles which describe how the PP Basic Principles should be applied to the main steps and specific activities of the EA process, and Developmental Principles which point the way for future development in PP.

This presentation aims to summarize a draft version of the PP Best Practice document which has been developed under the coordination of the authors, in accordance to IAIA priorities, in conformity with IAIA strategic planning for 2003-2004, and following recommendations from PP session participants at IAIA'03 (Marrakech). It will stimulate debates and discussions for the following workshop on this worldwide issue. After this exercise, the authors will produce a revised version of the PP Best Practice document and submit it to IAIA Council for approval.

Key words: *public participation, best practice, guiding principles*

INDUSTRY AND CIPEC: MAKING PROGRESS IN ACHIEVING KYOTO OBJECTIVES

Dittburner, Doug
Unilever Canada, Rexdale Plant
195 Belfield Road
Rexdale, Ontario M9W 1G8 Canada
+1 416 240 4746 Fax: +1 416 247 8677
doug.dittburner@unilever.com

Unilever, a global company, produces and markets a wide range of foods, home and personal care products. The Unilever Canada Rexdale plant produces approximately 185 million pounds of edible oil products each year. Products include some of the leading brand name margarines, such as Becel and Imperial.

The presentation describes the comprehensive program implemented to increase energy efficiency at the Rexdale Plant, by reducing use of all energy forms and engaging the employees in these efforts.

- Teaming up with CIPEC and NRCan
- By optimizing the energy performance of existing plant and equipment
- By Setting Performance Targets based on Historical Operating Conditions
- Providing information on attainment of those targets to people responsible for consumptions to allow them to spot wastage
- Setting up a policy of the organization's commitment to energy conservation and the environment
- Creating an organizational structure to facilitate energy management activities
- Motivating people in the organization to treat energy management seriously
- Implementing information systems to fuel monitoring and control functions (M&T)
- Provide needed resources-people with the appropriate knowledge, skills and attitudes-are in place

The achievements in Energy Intensity Reduction from 1999 to 2004 are: Natural Gas reduced 39%, Electricity 24%, Steam 50%, Compressed Air 27%, Water use reduced 52%. The results are related directly to production (per 1000lbs.) so that the same basis for comparison is used from year to year.

In total, the changes required an outlay of $1,524,305 and returned an annual saving of $3,190,241

The team is focused on making energy savings a way of life for all the employees. Energy boards are located in four locations within the plant. Not only do they show off what projects have been implemented, but also congratulate and credit the employees who have contributed to the program.

ENVIRONMENTAL ASSESSMENT CAPACITY BUILDING - EA TOOL KIT

Carlick, Susan M.
FNEATWG
Box 256, Atlin, BC V0W 1A0 Canada
+1 250 651 2188
scarlick@trtfn.com

The First Nations Environmental Assessment Technical Working Group is comprised of EA Practitioners from First Nations, BC, and Canada. The FNEATWG acts as a resource body on First Nation environmental assessment practices for interested First Nations, First Nation organizations, the Environmental Assessment Office and other concerned agencies and organizations. The FNEATWG is committed to assisting First Nations build capacity to participate in and deal effectively with Environmental Assessments conducted in the province of BC.

To begin to address this important objective the FNEATWG is completing an important project and would like to make a presentation at the conference regarding an important initiative that is intended to assist and enhance First Nations' capacity to deal with and participate effectively in Environmental Assessment conducted in British Columbia.

The resource manual is entitled: *First Nation Environmental Assessment Tool Kit Tool Kit Overview*. The Tool Kit contains comprehensive material to provide First Nations with a concise understanding of Environmental Assessment and some associated technical and decision-making processes.

The Tool Kit is a substantive document (1 -2 large binders) that is intended to assist First Nation to deal with current or future environmental assessment that may be happening in their traditional territories. In particular it provides resources that explain the BC Provincial and Federal Environmental Assessment processes, as well as providing a step-by-step guide to conducting independent EAs. In addition, it provides resources for conducting a traditional use study (TUS) and describes potential funding sources that may be available for participating in EA's or conducting TUSs.

The Tool Kit will be available in March 2004 in Hard Copy and in the latter part of 2004 the web-based tool kit will become available.

LIENS ENTRE LA RÉDUCTION DE LA PAUVRETÉ ET LA GESTION DE L'ENVIRONNEMENT EN AFRIQUE - LES DÉFIS À RELEVER À L'ACDI AU NIVEAU DES POLITIQUES ET LES OCCASIONS À SAISIR

Bilodeau, Jacqueline
Unité de l'Évaluation et de la conformité environnementales
Direction de l'Environnement
Direction générale des Politiques
Agence canadienne de développement international
200, promenade du Portage
Gatineau (Québec) K1A 0G4 Canada
+1 819 953 4932 Fax: +1 819 953 3348
jacqueline_bilodeau@acdi-cida.gc.ca

La présentation porte sur les mécanismes susceptibles de réduire la pauvreté et de maintenir la croissance dans le cadre du Nouveau partenariat pour le développement de l'Afrique (NPDA) mis sur pied lors du Sommet du G8 qui s'est tenu à Kananaskis, en Alberta, au mois de juin 2002 et du Fonds canadien pour l'Afrique administré par l'Agence canadienne de développement international (l'ACDI). On y définira les liens existant entre la pauvreté et l'environnement et démontrera que de saines et équitables pratiques de gestion de l'environnement sont essentielles pour atteindre les Objectifs de développement du millénaire, en ce qui a trait à l'éradication de l'extrême pauvreté et de la faim, à la réduction de la mortalité infantile, à la lutte contre les graves

maladies, au renforcement des capacités des pauvres, au soutien à la bonne gouvernance ainsi qu' au développement et au maintien d'un environnement durable.

Je me propose de présenter les éléments et les approches susceptibles d'assurer une évaluation de l'environnement durable pour nos partenaires africains. Pour ce faire, je tracerai trois tableaux comparatifs dans lesquels les politiques principales de l'ACDI seront analysées par rapport à leur conformité aux principes du développement durable et aux pratiques en vigueur. Le premier tableau touche à l'évaluation des politiques de l'ACDI portant sur le rôle de l'Agence à la lumière de douze particularités de base inhérentes aux meilleurs processus d'évaluation de la durabilité et à sept principes généraux de durabilité. Le deuxième tableau évalue les politiques de l'ACDI en matière de développement durable et la mise en application de la Loi canadienne sur l'Évaluation environnementale (LCÉE)en vertu des critères mentionnés ci-dessus. Le troisième et dernier tableau étudie les politiques de l'ACDI en regard des six priorités de l'Agence.

Les douze particularités d'évaluation de la durabilité examinées sont: connection, concentration, participation, profondeur et intégration, prise en compte du contexte, largeur du champ d'application, aspects positifs, mise en place en amont, alternatives, suivi, principe de précaution et adaptation, motivation.

Les sept principes généraux de durabilité sont les suivants: intégrité, suffisance et occasions, égalité, efficacité, démocratie et société civile, précaution et adaptation et intégration.

RÔLE DES POPULATIONS LOCALES DANS LA GESTION DURABLE DES RESSOURCES FORESTIÈRES : STRATÉGIE POUR LEUR IMPLICATION

Mengue, Célestine
Groupe d'Études Interdisciplinaires en Géographie et Environnement Régional (GÉIGER)
Université du Québec à Montréal
C.P. 8888, Succursale Centre-Ville
Montréal, QC H3C 3P8 Canada
+1 514 826 0909 Fax: +1 514 987 3000 poster 4923#
menguec@yahoo.fr

Depuis les années 80, le Gouvernement gabonais s'est engagé dans un processus de gestion durable des forêts avec la loi 1/82, dite loi d'orientation en matière des eaux et forêts. La forêt occupe donc une place importante dans l'économie du pays. Récemment intégrée dans le processus de décision suite à l'adoption du nouveau code forestier en décembre 2001, le concept d'aménagement forestier demeure mal compris par certains opérateurs économiques. Les impacts à long terme de l'exploitation forestière ne sont pas bien évalués, notamment ceux liés à la présence de riverains.

Au moment où la prise en compte des populations locales fait l'objet de débats au niveau international, fort est de constater que celles-ci ne sont pas intégrées dans les programmes d'aménagement. Une analyse de la nouvelle loi forestière montre que les aspects relatifs aux droits coutumiers sont incomplets et relativement vagues dans leurs descriptions. Sur le terrain, on remarque par ailleurs que l'implication des populations locales se limite encore à une simple collecte d'informations et non à une volonté de les impliquer véritablement dans le processus de prise de décision. La présente communication vise à présenter les enjeux socio-économiques de l'exploitation forestière dans la forêt gabonaise, principalement ceux liés à la multiplication des conflits, au cadre juridique et institutionnel de gestion du terroir ainsi qu'au manque de transparence dans l'attribution des forêts pour la production soutenue. Pour terminer, des propositions seront faites dans le but d'améliorer les conditions de vie, déjà précaires, des communautés villageoises vivant dans les zones exploitées.

Mots clés : *gestion intégrée des ressources naturelles, populations locales, gestion des conflits, environnement humain*

PROTECTION OF THE CULTURAL AND ECOLOGICAL HERITAGE—SEISMIC ACQUISITION IN THE MURZUQ DESERT IN LIBYA

Miné, Jacques
Total DGEP/SE France

Ringenbach, Jean-Claude; Clément, Francis; Wattez, Olivier
Total E&P Libya

In December 2001, Total E&P Libya started a 2D seismic campaign of more than 3400 km in the desert area of the Murzuq basin in Libya. This large concession (16,500 km2) comprises three types of terrain: plateaux, gravel plains and sand dunes.

Results from the Environmental Baseline Study and from the Environmental Impact Assessment which followed, showed that the environment was very sensitive regarding at least three criteria: the area had endangered fauna and flora, it had a very rich archaeological patrimony, and the landscape was worth be protected. A number of exceptionally rich archaeological sites have been found , most of them dating back to the Neolithic age.

The paper will present the measures taken to minimise the impact of the seismic campaign, which included:

- appointment of archeological and ecological teams of European and Libyan experts
- protection of the archaeological sites, marked and avoided, even to the extent of rerouting lines
- ban of use of dozers were on the Messak Plateau (reg) in order to limit the residual visual impact
- special attention brought to waste management

- restoration of lines and camp sites, using chains and roller in order to minimise the activity footprint
- post-activity assessment

The paper will discuss the effectiveness of these measures, which proved to be efficient, and demonstrated the importance of early EBS and EIA to identify the key issues and take the correct mitigating measures which made this seismic campaign successful.

GOUVERNANCE ENVIRONNEMENTALE : EXAMEN CRITIQUE DU NEPAD ET DES DSRP

Noubissié Ngankam, Emmanuel
Banque Mondiale
Ekoudou, Bastos
Yaoundé, Centre BP. 1128 Cameroun
+237 221 80 30 Fax: +237 221 07 22
enoubissie@worldbank.org

Contexte. La réflexion et le cadre conceptuel du développement de l'Afrique ont de nouveaux noms serait-on tenté de dire. Au plan continental, le NEPAD a été adopté par les Chefs d'Etats membres de l'Union Africaine (UA) en Juillet 2001 et au plan national, un certain nombre de pays sous la houlette des institutions financières internationales ont élaboré ou élaborent leur Document de Stratégie de Réduction de la Pauvreté (DSRP).

Ces deux documents ont entre autres, trois caractéristiques communes :

- Ils visent exactement les mêmes objectifs à savoir éradiquer la pauvreté en Afrique et réaliser in finé les Objectifs de Développement du Millénaire (ODM) des Nations Unis.
- La réflexion sur le développement qui y est conduite, n'est pas cantonnée, comme cela a été longtemps le cas, à sa seule dimension économique, mais s'intègre aussi aux autres sphères ayant un impact direct sur la qualité de vie de l'Homme.
- Les préoccupations environnementales y sont explicitement prises en compte.

Ces préoccupations environnementales qui y sont exprimées, s'appuient entre autres sur un certain nombre d'affirmations fortes au plan continental, et sur un cadre législatif et réglementaire plus ou moins pertinent au plan national.

Problématique et Objectifs du Papier. La Gouvernance environnementale comprise comme l'ensemble des bonnes pratiques en matière environnementale, a pour base, les institutions, les législations, les textes réglementaires, les structures de formation. Quel est l'état de cette base ? Cette base permet-elle dans le contexte actuel de faire des préoccupations environnementales un des piliers du NEPAD et des DSRP suivant des normes internationalement admises ?

Méthodologie. Il s'agira essentiellement d'examiner le contenu du NEPAD notamment la priorité sectorielle B4 relative à " l'Initiative Environnementale ", et d'un DSRP. Nous avons choisi celui du Cameroun et ce pour deux raisons :

- Il est bien connu par l'auteur
- Le Cameroun a achevé le processus d'élaboration du DSRP et le document final a été présenté en Juillet 2003 aux Conseils d'Administration de la Banque Mondiale et du FMI.

Le chapitre 3.5.3.3 du DSRP du Cameroun est consacré à l'Environnement.

Conclusion. De cette analyse, seront tirées des conclusions devant permettre d'ouvrir le débat sur le " Comment " du renforcement de la dimension environnementale du NEPAD et des DSRP afin de faire des préoccupations environnementales un des sujets transversaux majeurs du Développement et de permettre une meilleure gouvernance environnementale sur le continent africain.

DES EXPLOITATIONS MINIÈRES LIÉES AUX PROBLÉMATIQUES ENVIRONNEMENTALES AUX PROGRAMMES ROUTIERS, LE RÔLE DU WWF DANS DEUX DOMAINES FIGURANT PARMI LES PRIORITÉS DU NEPAD

Ramarojaona, Lantosoa
WWF Madagascar Océan Indien Occidental
BP 738, 101 Antananarivo, Madagascar
+ 261 20 22 348 85 Fax: + 261 20 22 348 88
lpramarojaona@wwf.mg

Depuis 1998, période de découvertes de nombreux gisements de saphir dans plusieurs endroits de la Grande Ile, Madagascar est confronté aux problèmes environnementaux causés par des exploitations anarchiques de cette pierre précieuse. Dès le commencement de ce phénomène, le WWF a figuré parmi les premières entités à manifester ses préoccupations, à conduire des réflexions et à proposer des actions.

En 2003, la Délégation de l'Union Européenne à Madagascar a mandaté le WWF pour assurer le contrôle-qualité des études d'impact environnemental réalisées dans le cadre de son programme de construction et de réhabilitation de certaines routes nationales malgaches.

Dans ces deux cas différents, l'objectif du WWF a été toujours de contribuer à la concrétisation de l'intégration de la dimension environnementale dans les programmes d'investissements. Ce, d'autant plus que la reconstruction et la réhabilitation des routes, ainsi que l'encouragement aux divers investissements sont parmi les priorités du Gouvernement actuel.

A partir de ces deux exemples, notre communication traitera deux des dix priorités du NEPAD - environnement et infrastructures - et fera le lien avec la mission du WWF.

Pour le WWF à Madagascar, après la mise en œuvre du texte portant sur la Mise En Compatibilité des Investissements avec l'Environnement (décret MECIE), l'heure est maintenant de susciter les promoteurs de conduire des EIE de qualité, et d'inviter les entreprises anciennement installées et qui n'étaient pas encore soumises aux réglementations actuelles, à se mettre en conformité.
Bref, de ne pas considérer le décret MECIE sous un aspect coercitif, mais comme un levier figurant parmi les outils de développement.
Que le développement durable allant de pair avec respect de l'environnement ne reste pas un vain slogan, mais qu'il soit une politique à mettre concrètement en œuvre au sein des entreprises d'une part, et élargie au niveau régional et national, d'autre part.

Mots-clés : *politique, dimension environnementale, mecie*

LA DESTRUCTION DES ÉCOSYSTÈMES FORESTIERS DE LA PROVINCE DU BAS-CONGO (RÉPUBLIQUE DÉMOCRATIQUE DU CONGO)

Shuku Onemba, Nicolas
Association Nationale pour l'Evaluation Environnementale
Avenue Kilangwe n° 2634 Commune de Lemba
Ville de Kinshasa 0243
République Démocratique du Congo
+243.81.510.33.30/+243.89.60.647
+001.775.822.7069/001.419.781.8625
shukuonemba@yahoo.fr
shuku_onemba@hotmail.com
anee_rdc@yahoo.fr

Le Bas-Congo regorgeait et regorge encore un écosystème forestier riche. Sa destruction est liée à plusieurs causes humaines : pressions économiques, sociales, politiques, gestion des ressources naturelles.

Les facteurs contribuant à des pressions anthropiques sur les écosystèmes sont : accroissement démographique, pauvreté extrême et répandue, productivité agricole médiocre, pollution sociale et morale, occupation anarchique du sol, agriculture non sédentaire, abattage des arbres

Actuellement, le défrichage de forêts au profit de l'agriculture itinérante et le prélèvement des combustibles ligneux pour des besoins humains constituent la principale cause de destruction forestière.

Le besoin agricole, en bois de construction, bois d'œuvre, bois de feu vide les forêts galeries de leur contenu facilitant la destruction des espèces vivantes , phénomènes perceptible dans les territoires de " CATARACTES " .

Le District de LUKAYA n échappe pas à la destruction de la biodiversité car l'exploitation de forêts a détruit les pouvoirs d'auto générateur et auto-épurateur de ces écosystèmes laissant de recrue forestière s'épuisant par la carbonisation de combustibles ligneux.

L'exploitation irrationnelle des écosystèmes aboutit à la destruction des niches écologiques des espèces végétales et animales menacées de destruction.

Ceci représente une atteinte à la biodiversité, particulièrement aux protéines animales faisant défaut au Congo.

A long terme, la déforestation, conduira à la désertification des sols et à une modification catastrophique des régimes des eaux. Nous constatons au Bas Congo, la sécheresse, la pénurie des produits forestiers ne satisfaisant plus les besoins quotidiens des populations en nourritures suite à la disparition des produits végétaux, animaux et espèces médicinales.

Toute l'économie rurale est déstabilisée et la vie des hommes n'est plus qu'une lutte pour la survie. Le Nekongo reste bloqué dans la pauvreté.

Bref, la vie dans le Bas Congo devient incertaine, précaire, à cause de la rupture d'équilibre entre l'arbre, le sol, le climat et les activités humaines.

Mots-clés : *ecosystèmes, biodiversité, espèces végétales et animales*

L'IMPACT DE LA PRODUCTION DE CHARBON E BOIS DANS LA COMMUNE DE LEMBA

Shuku Onemba, Nicolas
Association Nationale pour l'Evaluation Environnementale
Avenue Kilangwe n° 2634 Commune de Lemba
Ville de Kinshasa 0243
Répub lique Démocratique du Congo
+243.81.510.33.30/+243.89.60.647
+001.775.822.7069/001.419.781.8625
shukuonemba@yahoo.fr
shuku_onemba@hotmail.com
anee_rdc@yahoo.fr

Les combustibles ligneux qui entrent dans la commune de Lemba à Kinshasa, y arrivent par route et / ou éventuellement par rail. Ils proviennent essentiellement de la province du Bas Congo et celle du Bandundu , Leur transport est une activité très rémunératrice.

Dans cette commune, une personne brûle mensuellement 15 kg de bois de chauffe et 10,5 kg de charbon de bois, engendrant des problèmes de survie dans les ménages. Les besoins en combustibles ligneux sont respectivement de 31.223 et 720.000 tonnes de bois de chauffe , de 21.856 et 504.000 tonnes de charbon de bois pour Lemba et Kinshasa et occasionnent certaines conséquences.

1. Impact de consommations des combustibles ligneux sur les budgets familiaux
Leur impact sur les budgets familiaux est très considérable. En effet, un ménage qui consomme 2 tas de charbon de bois

par jour dépensait zaïres deux millions en 1993, par jour. C'est une dépense énorme à la quelle les masses laborieuses avaient du mal à faire face à cause de leur pouvoir d'achat très faible.

2. Impact de consommations des combustibles ligneux sur l'environnement
Sur le plan environnemental, il existe une série des conséquences néfastes. Celle-ci se manifeste par la disparition des certaines espèces végétales et animales corrélatives à la destruction des niches écologiques, la modification du climat, des précipitations, l'érosion du sol, la perte de fertilité du sol, la réduction de l'infiltration qui provoque l'augmentation du ruissellement qui, à son tour, peut entraîner les inondations...

Concernant le déboisement provoqué par les besoins en bois de feu à Lemba, l'exploitation forestière, comme pratiqué dans les zones de productions de combustibles ligneux engage ces zones pourvoyeuse dans une série régressive " forêt- savane- steppe- désert "Les espaces forestiers exploitée sont actuellement remplacé par les savanes. La savanisation liée à l'action anthropique

Mots-clés : *combustible ligneux, charbon de bois, déforestation*

LE NEPAD ET LE CONFLIT ARMES EN RDC

Shuku Onemba, Nicolas
Association Nationale pour l'Evaluation Environnementale
Avenue Kilangwe n° 2634 Commune de Lemba
Ville de Kinshasa 0243
République Démocratique du Congo
+243.81.510.33.30/+243.89.60.647
+001.775.822.7069/001.419.781.8625
shukuonemba@yahoo.fr
shuku_onemba@hotmail.com
anee_rdc@yahoo.fr

Depuis le 02 août 1998, le Congo Démocratique était victime d'actes d'agression et d'occupation de la partie Nord-Est de son territoire par les troupes étrangères alliées aux forces rebelles.

De ce fait, les Congolais avaient manifesté leur opposition par des résistances non armées et armées.

Pour affaiblir cette résistance, les occupants avaient mis en place de stratégies de destruction des espèces végétales, animales, humaines, et écosystèmes.

Ces contextes de violences généralisées entraînaient et continuent à entraîner plusieurs conséquences aux pays.

L'Evaluation environnementale en cas des Conflits Armés est souvent axée sur plusieurs domaines entre autre, le droit, l'économie, le social, la culture, les ressources naturelles, l'environnement...

Parmi les impacts des conflits sur l'économie et le social, nous épinglerons en RDC les violations, les massacres, les arrestations, fermetures d'usines, disparitions d'entreprises, débrouilladismes, chômages.

Les impacts sur l'environnement sont entre autres : menaces et déséquilibre de la biodiversité, destruction des écosystèmes, parcs, braconnages, l'exode incontrôlé, érosions.

Quant aux impacts de la guerre sur les personnes vulnérables, nous citerons le viol, harcèlement sexuel, assassinat, viol exercé sur les femmes congolaises avec mobil la transmission du VIH /SIDA et maladies sexuellement transmissibles, mutilation des femmes enceintes, enterrement des femmes vivantes, massacres des enfants, spoliation des biens de vieillards.

Il existe aussi les impacts de la guerre sur les ressources tel est le cas de pillage des minerais, des bois d'œuvre, des exploitations forestières produits agropastoraux, faune et flore en détruisant le réserve.

Le NEPAD par le biais des organismes internationaux a facilité l'installation de la paix et la sécurité au Congo, en introduisant la bonne gouvernance, la démocratie,la transparence car la population était marginalisée, pauvre et en retard du développement.
Actuellement, les secteurs éducationnels, sanitaires et énergétiques reçoivent des essors considérables.

Mots-cles : *NEPAD, agression, impact, pillage, massacre, déséquilibre de la biodiversité, braconnage*

SOCIAL IMPACT ASSESSMENT IN URBAN PLANNING

Sairinen, Rauno
Centre for Urban and Regional Studies
Helsinki University of Technology
PL 9300, 02015 TKK Finland
+358 9 451 4089 ++358 50 442 3146
rauno.sairinen@hut.fi

The purpose of this paper is to analyse the content and importance of social impact assessment (SIA) in urban planning in Finland. In Finland the new Land Use and Building Act, which came into force on 1.1.2000, brought impact assesment as an integral part of urban planning. At the same time, the new legislation strengthened the requirements for procedural openness and communication.

SIA can be defined as a systematic effort to identify and analyse social impacts of a proposed project or plan on the individual, on social groups within a community, or on an entire community in advance of the decision making process. Social impacts of urban plans refer to various factors such as quality of housing, local services and living environment, experienced health and security, people's ways of life, gentrification or segregation, conditions of transportation etc.

It is implicit that social and biophysical impacts (and the human and biophysical environments) are interconnected.

The paper analyses the possible role of SIA in different land use plans in Finland and the revelevant contents of this impact assessment in various planning contexts (such as urban waterfronts, new housing areas, etc.). In addition, the paper presents a typology of various factors (dimensions of impacts) for different scales of urban planning. It is important to understand what kind of impact typologies are relevant in various scales of planning such as detail plans, general plans or regional plans.

Key words: *social impact assessment, urban planning*

PSYCHO-SOCIAL MONITORING OF AN INDUSTRIAL ACTIVITY

Palma-Oliveira, José Manuel
Faculdade de Psicologia e de Ciências da Educação
Universidade de Lisboa
Alameda da Universidade
1649-013 Lisboa, Portugal
+351 217955310
palma.lda@netvisao.pt

Paraíba Mata, André Otelo; Gaspar de Carvalho, Rui Filipe
Antunes, Dalila Isabel dos Santos Paulo
Universidade Independente
Palma Consultores
Rua António França Borges,
21A, 2560-337 Torres Vedras, Portugal
andreparaiba@aeiou.pt
ruifgc@iol.pt
dalilaantunes@hotmail.com

This presentation concerns the psycho-social monitoring of an industrial activity, performed in 2003. Results from this monitoring (time 2 &#8211, t2) are compared to the data collected for the environmental impact assessment study conducted in 1998 (time 1 &#8211, t1), prior to the construction of the facilities. The goal is to illustrate the way local people&#8217,s evaluation of, and adaptation to, outputs of industrial activity (such as pollution) evolved through time. 200 residents at t1, and 600 at t2, answered a phone survey where they expressed their attitudes, perceived risk and control towards industrial activity.

The t2 results reveal a surprising pattern considering the environmental stress theory (e.g., Palma-Oliveira, 1992, Lazarus & Folkman, 1984), especially the findings regarding comparisons between these results and those obtained at t1. First, the t1 attitude towards local pollution is more positive than the one found for national pollution, which is predicted by environmental stress models. However, the opposite pattern was found at t2. These results suggest that whereas in t1 participants were engaging in social comparison (e.g. Taylor, 1983), in t2 this adaptation strategy ceased to be implemented, which is further supported by the almost insignificant difference found between the t2 perception of risk to self and to others, both high. However, as the perceived risk raised, so did the perceived control, which seems to be an apparent paradox!

An explanation for this finding was presented by Prince-Embury (1992, Prince-Embury & Rooney, 1987, 1989) who hypothesized a dissociation process between risk perception and control. This would enable people to adapt to an aversive situation as they would be able to nurture a sense of control and mastery despite the risk they perceive. This is supported by the fact that whereas at t1 these variables were found to be correlated, such association was not found at t2.

Key words: *psycho-social monitoring, environmental stress, adaptation, perceived risk, perceived control*

PSYCHOLOGICAL AND PHYSICAL DETERMINANTS OF NOISE ANNOYANCE: THE INTERACTION BETWEEN CAR AND TRAIN

Palma-Oliveira, José Manuel
Faculdade de Psicologia e de Ciências da Educação
Universidade de Lisboa
Alameda da Universidade
1649-013 Lisboa, Portugal
+351 217955310
palma.lda@netvisao.pt

Antunes, Dalila Isabel dos Santos Paulo
Universidade Independente
Palma Consultores
Rua António França Borges
21A, 2560-337 Torres Vedras, Portugal
dalilaantunes@hotmail.com

A field study which analyses the predictability of noise annoyance either by physical characteristics of the stimuli (train and car noise) and by individual psychological characteristics (e.g. cognitions towards the stimuli) will be presented.

In an urban area of Lisbon, 7 points of noise measurement were selected. On each point, noise was measured objectively during day and night and characterized in terms of car noise, train noise, plane noise and global noise. Moreover, the nearby residents were interviewed by psychologists who filled a questionnaire which measured noise annoyance* (global, train and car noise annoyance), attitudes towards the train*, neighbourhood identity*, the practice of coping strategies, health problems and anxiety (STAI- Spielberger State and Trait Anxiety Inventory). Regarding psychological data, the results were the following: 1) there were no differences between train noise annoyance and car noise annoyance for each place, 2) the night train noise was more strongly related with the train noise annoyance than the day train noise, 3) residents showed low average of annoyance related to the train, but there were differences between places, 4) there was a negative correlation between attitudes towards the train and train noise annoyance, 5) people who

love the train don't use coping strategies as much as the ones who dislike it, 6) when the annoyance is higher there is an increasing in coping strategies, even if in average people don't use much coping strategies, 7) health problems are mainly related with night measures of noise, 8) it wasn't found any relation between anxiety (trait or state) and noise annoyance.

The main predictors of annoyance were identified after a Forward Stepwise regression analysis, which allowed us to develop a model to explain train noise annoyance. The major determinant of train noise annoyance was the attitude towards the train.

This study was developed for REFER - Rede Ferroviária Nacional

* scale with psychometric validation

Key words: *transport's noise, noise annoyance, physical characteristics of noise, psychological determinants of noise annoyance, train noise annoyance model*

THE DEVELOPMENT OF AN INTEGRATED MITIGATIN PROGRAM FOR THE PROTECTION OF THE OSPREY WITHIN THE LOW-LEVEL TRAINING PROGRAM AT GOOSE BAY, LABRADOR

LaPierre, Louis
Institute for Environmental Monitoring and Research
University of Moncton
Moncton, NB E1A 3E9 Canada
+1 506 858 4152 Fax: +1 506 863 2000
euzebe@nbnet.nb.ca • www.iemr.org

Over the past six years, the Institute has succeeded in developing with DND and the approval of the Institute board members a comprehensive mitigation program to ensure the protection of the Osprey within the low-level training area.

The EIS indicated a wide distribution of osprey in Labrador with densities varying according to habitat and ecoregions with the highest densities being situated along transmission lines. Although a complete census has not been completed an annual nest distribution database was maintained since 1994. A review of the data for 1998 showed 287 active nests within the 150,000 km2 training area. Trends since 1994 indicated that nest activity/occupation appeared relatively consistent with reproductive success peaking every 4-5 years.

In 1994 behavioural studies were initiated to assess reaction to jet aircraft activity and no significant differences were documented before and after over flights. The results of a 1996 study found no relationship between exclusion zone size and reproductive success. In 1997 and 1998 reproductive success was measured by manipulating block treatments in control and treatment areas with no significant differences demonstrated.

The impact of natural factors such as weather, nest stability, predation and human influences such as DDT, military activity, forest harvesting, road construction, and hydroelectric development were collated and analysed in this study.

Conclusions. As a result of the concerns expressed by the aboriginal communities the EIS indicated that osprey nest within the training area should be protected by a 2.5 nm avoidance criteria, due to the large number of nests this caused some serious problems in terms of delivering the training program. Following a review of the data which had been collected since 1994 the IEMR board agreed that:

a) the 2.5 nm avoidance criteria closures could be lifted as the data demonstrated that there is a stable, healthy osprey population both within and outside the training area..
b) IEMR will ensure an annual monitoring of a representative sampling of active nests both within and outside the training area in order to detect any variances.

Key words: *Osprey, consensus decision making, military training, aboriginal issue, noise disturbance, mitigation program*

SEA AND THE GHANA POVERTY REDUCTION STRATEGY

Nelson, Peter
Land Use Consultants
14, Great George Street, Bristol, BS1 5RH UK
+44 1179 291 997 Fax: +44 1179 291.997
Nelson_p@bristol.landuse.co.uk

Azare, C.; Sampong, E.; Yeboah, B.; Darko-Mensah, E.

This paper will expand on the work described in 'Building Capacity in SEA in Sub-Saharan Africa' presented at IAIA 2003, Marrakech, by the same author.

The SEA of the Ghana Poverty Reduction Strategy constitutes the first known application of SEA to a national poverty reduction strategy (there are over 40 such strategies worldwide). Its aim is to mainstream consideration of the environment within poverty reduction policies, plans and programmes in Ghana. The SEA has been conducted at two levels, involving a detailed appraisal at national level of over 400 policies representing the programmes of 30 Ministries, Departments and Agencies. These national sector studies have been paralleled by the sustainability appraisal of all but two of the 210 District Assembly Medium Term Development Plans. The paper will describe the underlying concepts, approach, methodology and outputs.

Key words: *strategic environmental assessment, policy appraisal, poverty reduction, sustainable development*

CLARIFYING THE SCOPE AND MEANING OF INTEGRATION, INTEGRATED ASSESSMENT AND SUSTAINABILITY ASSESSMENT

Hacking, Theo
University of Cambridge
Department of Engineering, Centre for Sustainable Development
Trumpington Street, Cambridge, CB2 1PZ UK
+44 (0)1223 76685 Fax: +44 (0)1223 765 625
th252@cam.ac.uk • www-g.eng.cam.ac.uk/sustdev/

The terms 'integrated assessment' and 'sustainability assessment' (and variations of these terms) are commonly used in the literature promoting the use of impact assessment as a sustainable development (SD) tool. They are used synonymously by some authors, but others use them to, for example, distinguish between enhanced forms of traditional impact assessment and newer SD-directed assessment techniques. 'Integration' is a popular theme within these discussions and it is used to label a wide variety of (desirable) characteristics of the assessment processes.

A number of researchers have explored the scope and meaning of integration and one or more of the assessment types, however they have mostly focussed on developing their own interpretations and definitions rather than on reconciling and clarifying what others have already proposed. The resulting wide range of meanings attached to terms such as 'integrated assessment' and 'integration' is tending to erode their usefulness.

This paper will firstly aim to present a framework for clarifying the scope and inter-relationship of the main 'integration components' described in the literature. Secondly, it will attempt to reconcile the broad range of emerging approaches to SD-directed assessment and to overcome the somewhat inconsistent use of terminology by demonstrating that the various interpretations can be located within a spectrum defined by the following key axes: i) The extent to which an SD scope is covered. ii) The degree of alignment or combination of the tools used. iii) The focus of the assessment.

It is hoped that the clarification provided by these frameworks will encourage constructive further debate on the basis of substance rather than semantics.

Key words: *integrated assessment, sustainability assessment, integration*

INCORPORATING WEATHER AND CLIMATE FORECASTS INTO ENERGY PRODUCTION AND MANAGEMENT: ECONOMIC BENEFITS, IMPACT ASSESSMENTS, AND POWER INDUSTRY APPLICATIONS

Altalo, Mary
Science Applications International Corporation
8301 Greensboro Drive, McLean, VA Virginia 22102 USA
+1 703 676 4687
mary.g,altalo@saic.com

Hale, Monica
Science Applications International Corporation
+1 703 676 5012 Fax: +1 703 676 2934
halemo@saic.com

Davis, Todd
Science Applications International Corporation
+1 610 213 4251
todd.d.davis@saic.com

Pierce, David
Scripps Institution of Oceanography
University of California, San Diego
Climate Research Division
9500 Gilman Drive, Dept. 0224
La Jolla, CA 92093-0224 USA
+1 858 534 8276 Fax: +1 858 534 8561
pierce@cirrus.ucsd.edu

Steinemann, Anne
Georgia Tech.
City and Regional Planning Program
245 4th Street, Room 204
Atlanta, GA 30332-0155 USA
+1 404 894 6491
anne.steinemann@arch.gatech.edu

Barnett, Tim; Gershunov, Alexander; Alfaro, Eric
Scripps Institution of Oceanography
University of California, San Diego
9500 Gilman Drive, Dept. 0224
La Jolla, CA 92093-0224 USA
+1 858 534 3223 Fax: +1 858 534 8561
tbarnett-ul@ucsd.edu

This session will examine the effects of weather and climate variability on energy production and management, and the potential economic benefits of using climate forecasts in the energy sector's decision-making. The energy industry already uses weather forecasts to plan operations a few days ahead. However, many slower evolving climate phenomena also have impacts on the energy industry, on timescales from seasons to decades. The skill and applicability of these forecasts to the energy industry will be shown. Novel methods for evaluating the impacts (economic, environmental, social, among others) of using this forecast information will be presented. Results from case studies suggest that skillful forecasts can enhance overall economic performance, reduce environmental impacts, and improve energy reliability and security. Through detailed case studies involving power generating organizations, energy distributors, and government agencies, the effects of weather and climate variability on the energy sector have been calculated, using load forecast models and evaluations of load forecast error associated with specific weather and climate events. The case studies include irrigation pump loads, sea-breeze effects, advance scheduling of load demand management events on hot summer days, and hydropower generation. These studies employ forecasts for varying lead times (e.g., 0-7 days, 0-14

days, seasonal), different protocols (e.g., ensemble forecasts), and different weather and climate events, resulting in an overall evaluation of the benefits and costs to the energy sector. In addition to translating the forecast information into economic net benefits, results from these studies can be used in environmental and sustainability measures as increases in the efficiency of energy production and distribution can decrease adverse impacts on the environment. The session will focus on the following areas: (1) case studies, (2) impact assessments and methodologies, and (3) lessons learned.

Key words: *power industry, weather forecasts, load forecasting, environmental impact, delta breeze*

THE ELECTRICITY SECTOR: ENVIRONMENTAL COMMITMENT AND RESPONSIBILITY

Snow, Valerie
ECR Program Manager
Canadian Electricity Association
2037 Grey Ave., Montréal, QC H4A 3N3 Canada
+1 514 489 7406

The Environmental Commitment and Responsibility (ECR) Program was launched by the members of the Canadian Electricity Association (CEA) in 1997 as an industry wide approach to addressing environmental performance and sustainable development. The founding goal of the ECR Program was a commitment by members to develop and implement an ISO 14001 compliant EMS by December 31, 2002. To highlight the industry's commitment to this goal and the stewardship spirit of the ECR Program, participation became a mandatory requirement of CEA membership in 1998.

Each year, the annual ECR Report captures the industry's priorities while providing quantitative and qualitative measures of success. In 2004 the Program continues to focus on the industry's progress with developing smart policy solutions through a partnership approach with government to address key issues such as the promotion of energy efficiency and habitat stewardship. By offering stakeholders a snapshot of the industry's sustainable development efforts, the ECR Program strives to provide industry, governments and policy makers with a clear and accurate picture of sustainable development priorities and challenges. For more information on the ECR Program, please visit www.ecrprogram.ca.

CIPEC, CLIMATE CHANGE AND THE FOREST PRODUCTS INDUSTRY

Lansbergen, Paul
Taxation and Business Issues
Forest Products Association of Canada
99 Bank St., Suite 410, Ottawa ON K1P 6B9 Canada
+1 613 563 1441x306 Fax: +1 613 563 4720

Canada's forest products industry is a key contributor to the wealth and well-being of Canadians. The industry is the largest industrial sector, operating across the country. Equally important is how the industry makes this substantial economic contribution. The industry's social licence to operate demands sustainable management of Canada's forest resources. The industry has come along way and is now lauded for its actions. A perfect example is the pulp and paper's sector proactive efforts on energy management and climate change. This presentation will outline how innovative energy management within the forest products industry has led to significant environmental and economic benefits, and the challenges in making further improvements.

Voluntary action is commonplace within the industry. Whether it's acting early on climate change or signing with the federal government the first industry climate change Memorandum of Understanding, the forest products industry is going beyond. It is also why the Forest Products Association of Canada (FPAC) participates in the Canadian Industry Program for Energy Conservation (CIPEC). CIPEC has assisted the industry achieve its energy objectives and has showcased individual company achievements.

Involvement in CIPEC is now helping the industry continue its impressive track record. For example, benchmarking studies, currently underway, will highlight best practices in the industry and identify opportunities for further improvement. The next step will be to realize those opportunities. Unfortunately, the industry faces what has been called an economic "Perfect Storm", which has put severe constraints on capital investments, forcing a much shorter investment horizon than what is typically required for energy project investments.

MANAGING LARGE MULTIDISCIPLINARY, MULTICULTURAL EIAS

Chávez, Jorge
Golder Associates Peru S.A
Av. Jose Glavez, Barrenechea 511, Lima 41 Peru
+51 1 2249398 Fax: +51 1 4767884
jchavez@golder.com.pe • www.golder.com

Anderson, James
Golder Associates Ltd.
2390 Argentia Road, Lima Mississauga, ON L5N 5Z7 Canada
+1 905 567 4444 Fax: +1 905 567 6561
janderson@golder.com • www.golder.com

Raine, Michael
Golder Associates Ltd.
1000, 940-6th Avenue SW, Calgary, AB T2P 3T1 Canada
+1 403 299 5600 Fax: +1 403 299 5606
mraine@golder.com • www.golder.com

Burns, Holton
Minera Barrick Misquichilca S.A.
Pasaje Los Delfines 159
Tercer Piso, Urb. Las Gardenias - Surco

Lima 41 Peru
+51 1 2750600 Fax: +51 1 2750600
hburns@barrick.com • www.golder.com

Managing large Environmental Impact Assessment Studies (EIAs) can be very challenging. Typically, it involves the integration of numerous (often hundreds) specialists from different organizations, countries and cultures who speak different languages.

Golder Associates prepared a major EIA for the Alto Chicama Project for Minera Barrick Misquichilca. The Alto Chicama Project consists of an open pit gold mine that will be developed in the northern Andes of Peru. The Project is located in the Western mountain range of the Peruvian Andes at an approximate altitude of 4,150 m above sea level (masl). The gold will be recovered using a heap leach process. Based on current reserves, it is expected that the Project will operate for a period of eight to ten years. It will employ approximately 2,000 people during construction and 600 people during operations.

The preparation of the EIA involved the participation of 11 different companies and/or Golder offices from Peru, Canada, USA and Chile. With a total of about 250 persons involved with the project, logistical planning issues were critical to scheduling success. Translation of technical assessments, baseline documentation, background information and preparation of the draft reports in two languages was a significant issue. Other detailed planning issues included identification of key issues for the project, planning baseline studies given natural hydrological and biological annual cycles, and planning a comprehensive stakeholder consultation program. The success of this project was based on the team work of highly qualified professionals and technical personnel able to work across cultures.

An overview of the EIA will be presented with an emphasis on process and management related issues. The paper presents how cultural barriers were overcome and what administrative/ management measures were implemented to make the project a success. This presentation will help other teams to efficiently prepare large, high quality EIAs.

Key words: *EIA, mining environmental*

PREPARING FOR A SUSTAINABLE MINING DEVELOPMENT: THE CASE OF MAURITANIA (paper and poster)

le Beau, Yolaine
Environmental Studies Department
Resources and Environment Sector
Tecsult International Limited
85 West Sainte-Catherine St.
Montreal, QC H2X 3P4 Canad
+1 514 287 8500, ext. 8805
+1 514 287 8643
y.lebeau@tecsult.com

ould Tabakh, Khattar
Environmental Affairs Department
Mines and Geology Direction
Ministry of Mines and Industrie
Islamic Republic of Mauritania
B.P. 199, Nouakchott, Mauritania
+1 222 525 32 25
khattarouldtabakh@yahoo.fr

In 1999, with World Bank support, Mauritania implemented a Mining Sector Capacity Building Project. The aim of this project is to strengthen the government's capacity to facilitate and regulate activities and increase private investment in the sector. This will provide a sound basis for exploitation, over the years, of the country's mineral resources potential. Although mining development means economical growth, it also means dealing with environmental and social impacts and issues that are often complex and reach beyond the bounds of the mining sector. In a fragile environment such as Mauritania, mining development might induce incredible pressures on resources because of large shifts in population and a clash of the use of resources. This is the case of water which, more than any other resource, is an essential component for the preservation of existing activities and the development of new ones, and which is a vulnerable resource in this country at the limit of the Saharan and sub-Saharan zones.

At the outset of the project, the Ministry of Mines and Industry (MMI) was quite unfamiliar with these problems. Everything had to be done to assure an appropriate environmental and social framework and management, as sustainable as possible, for the valorization of the non renewable mineral resources. Environmentally and socially speaking, how did the MMI prepare to address these issues within the framework of the project? What were the objectives and expectations regarding the environmental facets? What were their contents? To whom was it addressed? What are the main conclusions to be drawn from the work undertaken? Where does the environmental process now stand? What are the next steps? These are the main questions this conference will discuss.

Key words: *social and environmental impacts, environmental management, capacity building, mining sector, Mauritania, World Bank*

ENVIRONMENTAL FOLLOW-UP AND MONITORING AT CANADA'S NATIONAL ENERGY BOARD

Farrand, Alison
National Energy Board
444 Seventh Avenue SW, Calgary, AB T2P 0X8 Canada
+1 403 299 2761 Fax: +1 403 299 2780
afarrand@neb-one.gc.ca

Finley, Chris
National Energy Board

+1 403 299 3118 Fax: +1 403 299-3110
cfinley@neb-one.gc.ca

Vander Valk, Mieke
National Energy Board
+1403 292 5048 Fax: +1 403 292 5876
mvandervalk@neb-one.gc.ca

The National Energy Board (NEB) regulates the construction and operation of interprovincial and international pipelines, the construction and operation of international and designated interprovincial power lines, and oil and gas activities on frontier lands and offshore areas not covered by federal/provincial management agreements. The NEB primarily carries out its duties under the National Energy Board Act (NEB Act), the Canada Oil and Gas Operations Act (COGOA) and the Canadian Environmental Assessment Act (CEA Act).

Environmental follow-up as contemplated under the CEA Act, may differ from environmental monitoring under the NEB Act. A rationale for the distinction between follow-up and monitoring is explained. A follow-up program is considered by the CEA Act as "a program for verifying the accuracy of the environmental assessment of a project and determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project." Monitoring activities under the NEB Act may overlap with CEA Act follow-up activities. However, monitoring activities under the NEB Act tend to be less issue-specific and focus on the ability to address environmental issues should they arise during project development (i.e., construction and operation). Therefore, the goals of NEB Act monitoring programs often emphasize practical or operational environmental issues, but are strongly complementary to the goals of CEA Act follow-up programs.

Regulated-companies can meet the requirements of both Acts as they design both follow-up and monitoring for federally regulated pipelines in Canada. Examples of environmental follow-up and monitoring programs which have occurred on NEB-regulated projects, will be discussed.

Key words: *environmental follow-up, environmental monitoring, energy regulation*

IMPACT OF SCHOOL CONSTRUCTION PROJECTS BY CANADIAN NGOS IN NICARAGUA

Connell, Mary Anne
R. R. No. 3, Palmerston, ON NOG 2PO Canada
+1 519 343 2668 Fax: +1 519 343 2554
connellm@on.aibn.com

This paper presents findings by the author while doing research on the impacts of school construction projects in Nicaragua.

There is a shortage of schools in Nicaragua. Because of this, volunteer organizations build schools there. In recent years the necessity of education has emerged as an important requirement in the prevention of poverty. A basic education enabling people to read, write and do simple arithmetic is a powerful tool in equipping people to care for themselves and their families. It enables them to get a job, do some entrepreneurial work, figure out the simple things in life, and make better use of indigenous knowledge. The first requirement of education is the desire to attend school, and the second requirement is the presence of a primary school in the community.

First, an analysis of the objectives, methods and processes of Canadian NGOs working in school construction projects in Nicaragua was done.

Secondly, the positive and negative impacts of school construction projects on families and the local community in Nicaragua were identified and analyzed.

Thirdly, the positive and negative impacts of school construction projects by Canadian NGOs on Canadian volunteers were identified and analyzed.

Fourthly, the causes of the positive and negative impacts of school construction projects on families and the local community in Nicaragua with a particular focus on participation were examined and explained.

Lastly, recommendations for action by Canadian NGOs and local communities and families with respect to mitigating negative impacts and reinforcing positive impacts of school construction projects were made and given to the Canadian NGOs.

Key words: *impacts of school construction, development, Canadian NGOs, Nicaragua*

IMPACT ASSESSMENT IN THE CONVENTION ON BIOLOGICAL DIVERSITY AND OTHER MULTILATERAL ENVIRONMENTAL AGREEMENTS

Höft, Robert
Secretariat, Convention on Biological Diversity

The Convention on Biological Diversity (CBD), in its Article 14, recognizes impact assessment as a tool to promote the sustainable use of biological resources. Accordingly, Parties to the Convention are requested to introduce appropriate impact assessment procedures and legislation to avoid or minimize adverse impacts of projects, programmes and policies on biological diversity. In decision VI/7-A, the sixth meeting of the Conference of the Parties held in 2002 adopted guidelines for incorporating biodiversity-related issues into environmental impact assessment legislation and/or process and in strategic environmental assessment. These guidelines focus on the screening and scoping stages and are being further developed to incorporate all stages of impact assessment. The International Association of Impact Assessment is a key partner in this process and, in

collaboration with IUCN-The World Conservation Union, a regular dialogue with the private sector is being held.

The CBD guidelines on biodiversity and impact assessment relate to all types of ecosystems and species and are therefore relevant to more specialized multilateral agreements. Accordingly, by Resolution VIII.9 the eighth Conference of the Parties to the Ramsar Convention on Wetlands also adopted the same guidelines, with supplementary guidance to assist Ramsar Parties in their application to impact assessment on wetlands. In accordance with resolution 7.2, the Convention on the Conservation of Migratory Species of Wild Animals is currently undertaking a review of existing international guidance on impact assessment with a view to developing guidelines which take into account possible impediments to migration, transboundary effects and impacts on migratory patterns and ranges.

In addition to the EIA guidelines developed in accordance with Article 14 of the CBD, the Ad Hoc Open-ended Working Group on Article 8(j) and related provisions has developed draft voluntary guidelines for the conduct of cultural, environmental and social impact assessments regarding developments proposed to take place on, or which are likely to impact on, sacred sites and on lands and waters traditionally occupied or used by indigenous and local communities. These are being considered by the seventh meeting of Conference of the Parties to the CBD in February 2004.

MAINTAINING BIODIVERSITY AND A STEWARDSHIP ETHIC - DIARY OF A HYDROELECTRIC COMPANY

Hill, Bonny
Generation - BC Hydro
6911 Southpoint Drive, 4th Floor
Burnaby, BC V3N 4X8 Canada
+1 604 528 3403 Fax: +1 604 528 7909
Bonny.Hill@bchydro.bc.ca

BC Hydro, a provincial Crown corporation, is Canada's third largest utility and is among the leading producers of hydro electricity in North America. The mission of the company is to provide integrated energy solutions to customers in an environmentally and socially responsible manner. By continually improving performance across the three bottom lines BC Hydro's goal is to become one of North America's leading sustainable energy companies. The challenge is to find effective ways to minimize the environmental effects of operations and still meet the responsibility to supply low-cost electricity to customers. Finding this balance is not easy or inexpensive. The size of BC Hydro's hydroelectric system and the many different biological, geological and climatic zones found in British Columbia require BC Hydro to continually plan and to undertake a variety of programmes and initiatives that maintain biodiversity and encourage stewardship efforts in its areas of operation. As the electricity company serving most of BC, BC Hydro is committed to protecting and enhancing biodiversity, sustaining resources for the long term and finding a balance between competing interests for water use. A selection of the programmes designed to achieve these commitments in partnership with local communities, governments and environmental groups will be discussed in the presentation.

POTENTIAL IMPACTS OF A CONFERENCE: THE 2004 IAIA REVIEWED

Bentzen, Michelle; Havers, Linda; Johnson, Adam; Traverso, Mark

A team of graduate students from the University of Calgary's Faculty of Environmental Design is invited to undertake an Environmental Impact Assessment of the IAIA 2004 conference in Vancouver B.C. The aim of the assignment is to learn the process of impact assessment and simultaneously suggest ways to reduce the environmental impact of the conference. The resulting assessment focuses on what the team deemed to be the most important 'effects', or attributes of the conference that cause impacts. These are broadly categorized as: mobility related impacts, resource consumption and waste. The summary that will be presented suggests mitigation measures and recommendations for future 'green meetings'. An overview of the Green Leaf program and ideas for auditing conference venues on their environmental performance is added for consideration.

While the students gain awareness about specific environmental impacts of tourism in an urban setting, they also uncover conceptual and methodological issues: For example, does accentuating positive aspects of the conference amount to environmental trade-offs? Can resource conservation, as emphasized by the approach of the Green Leaf program, be quantified and its relative magnitude adequately understood? How can we make estimates of avoided material use? Avoided land use, avoided water and energy use, avoided air emissions? Given these challenges, how to we suggest appropriate mitigation measures? The students grapple with the issues while coping with short timelines and on student budgets.

Key words: *green meetings, resource consumption, tourism, urban*

CLIMATE CHANGE IMPACTS ON ELECTRIC AND NATURAL GAS UTILITY ASSET OPERATIONS AND COSTS

Davis, Todd D.; Altalo, Mary G.
Energy Solutions Group
Science Applications International Corporation (SAIC)

This paper will demonstrate the practical value of applying climate science and modeling to electric and natural gas utility load and energy forecasting, and then applied to utility asset planning over a long term. The study is based on an earlier completed San Diego Regional Energy Infrastructure Study, which was completed in January 2003. The study

reports on the completion of a long-term climate forecast and identifies the seasonal temperatures and precipitation variations for a 30-year period. Then, the seasonal temperature changes are applied to electricity and natural gas energy forecasting and infrastructure planning.

The study found that seasonal climate change represents anywhere from 1oC-1.5 oC impact on the winter or summer load forecasts for electric and gas utilities. The increasing temperatures will have variable impacts on electric and natural gas infrastructure for San Diego County. The changes are likely to have a more gradual long-term impact affecting the infrastructure investment level and asset base in San Diego County as well as in the average yearly-monthly-daily operations of the energy assets. The historical analysis found significant near term annual behavioral impacts on electricity consumption due to price, behavior and weather. The regression models that were constructed controlled for price, customer education and other factors. Climate-induced temperature change was found to lower winter gas heating requirements and increase summer electric load requirements - more so for the residential market than commercial market. The impact of temperature increases took into account pricing, market growth, efficiency and other market responses. Weather demand impacts range form just a few MW for the commercial market to over 300 MW variations for the residential market. Additional impacts on both average annual seasonal demand for natural gas for the residential and commercial markets as well as for the maximum peak sendout for natural gas. The regression models developed were statistically significant.

A final major finding of the project was the incidence of extreme weather conditions in Southern California are expected to increase which will make peak day planning extremely important for both reliability and cost savings.

USING SOUND SCIENCE TO REACH A COMMON SENSE SOLUTION

Harkness, J.
Urban Systems Ltd.
Suite 200 – 286 St. Paul Street
Kamloops, BC V2C 6G4 Canada
+1 250 374 8311 Fax: +1 250 374 5334
kharkness@urban-systems.com

Warren, M.E.; Gillis, M.D.
City of Kamloops
Kamloops, BC Canada

In 1999, the City of Kamloops initiated a Liquid Waste Management Plan (LWMP), to establish direction for the safe and environmentally-sustainable handling of sewage. This process is completed through the Government of British Columbia, and aims to ensure that input is received from all stakeholders, including Federal and Provincial Government agencies and the public. The completion of a LWMP is a site-specific alternative to compliance with the British Columbia Municipal Sewage Regulation. To comply with this regulation, the City of Kamloops would have had to construct a biological nutrient removal facility, at a cost of $67.3 million.

As part of the City's LWMP, an environmental impact assessment was completed to determine whether a high standard of treatment was justifiable scientifically, or whether there were alternative options. This was challenging, due to the need to address the concerns of the multiple stakeholders on technical, non-technical and political levels. The City of Kamloops discharges effluent to the Thompson River, which has a high profile both politically and socially, due to events which occurred in the early 1970's. During this time, discolouration of the Thompson River, foaming, fish tainting and excessive algal growth were observed. This resulted in extensive studies being completed on the River to identify the causes of these problems and to enhance the understanding of the anthropogenic factors which can affect the health of the River.

The City's environmental impact assessment was completed in several phases. The terms of reference and outcomes of each phase were discussed and reviewed with the stakeholders. The final stages, a phosphorus mass balance and predictions of algal growth responses, demonstrated that there was no scientific justification for the implementation of a biological nutrient removal facility, and that an alterative phosphorus discharge, resulting in a capital expenditure of $25.5 million, is environmentally acceptable and sustainable.

The presentation will outline how a challenging and difficult process, involving multiple stakeholders, resulted in success through using sound science to develop a common sense solution.

Key words: *sewage effluent, sensitive receiving environment, multi-stakeholder interaction, common sense solution*

MINING AND EMS

Foster, John A.
JAFoster@golder.com

The mining industry has performed environmental impact assessments (EIA) of proposed projects for several decades. In most countries, the process of gaining approval for development is well laid out in non-voluntary, regulatory procedures. Permitting processes generally do not require development and certification of an internationally accredited Environmental Management System (EMS) such as ISO 14001. However, more frequently, mining companies see benefits in EMS, not only for their reputation and shareholder confidence but also, for benefits that EMS brings to local mines and communities. Usually, mining companies develop and certify EMS at operating mines. Rarely does a mining company seek EMS certification at an early stage of permitting approval. Such was the situation with De Beers Canada Mining Inc., which with the assistance of Golder Associates, certified an EMS for their Snap Lake, NWT diamond mine at the Advanced Exploration Stage. The EMS

was designed to grow with the mine as it advances through permitting, construction and operation phases. The EIA included commitment to a certified, third-party audited EMS throughout the life of the mine. Snap Lake has also integrated Sustainable Development principles and Occupational Health and Safety (OHSAS 18001) systems within its EMS. Dr. John Foster, Principal of Golder Associates, will use Snap Lake as an example of an integrated EIA/EMS approach to mine development.

With the permission of De Beers Canada Mining Inc.

Key Word Index

D

E

F

G

H

I

J

O

P

Q

R

S

T

U

V

W

Y

Author Index

D

E

F

G

H

I

J

N

O

P

Q

R

S

T

U

V

W

Y

Z

Appendix: Opening Plenary

INTEGRATING CLIMATE CHANGE INTO IMPACT ASSESSMENT: CHALLENGES FOR INTEGRITY AND CREDIBILITY

Dr. Bob Page

"The Kyoto Mechanisms and Impact Assessment: Science, Economics, and Perception." This is an industry view on the development of JI, CDM, and emissions trading. For both governments and industry, this has been one of the most exciting new and innovative tools now in the final design stages.

The perception draws on my experience as an advisor to the Canadian Kyoto negotiators, on my work on the international projects for TransAlta and for the International Emissions Trading Association, as well as my efforts with BIOCAP Canada Foundation where government, industry, and university scientists have put together a national research partnership on climate forestry and agricultural sinks.

While much of the work has been based upon techniques of traditional environmental impact assessment, there has also been much new and innovative thinking to address a variety of challenges including lack of infrastructure, assessment methodologies, developing country perceptions of sustainable development, speed and transaction costs while delivering integrity. The Kyoto mechanisms are designed to bring new private sector (not state aid) to climate projects in the developing world and economies in transition. The jury is still out whether the system will function.

Appendix: Opening Plenary

IMPACT ASSESSMENT: A TOOL FOR ABORIGINAL DEVELOPMENT

Grand Chief Dr. Ted Moses, O.Q.

Development places limits on the uses of natural resources and therefore commits societies to certain limited choices for the future. At first, aboriginal peoples adapted their economies to the European market's demand for furs and fish. In recent times industrial development has moved into aboriginal lands to exploit the rivers, trees and mining potential. Industrial farming, tourism, and a variety of other manufacturing and other projects all remove portions of the territory from continued use for traditional aboriginal resource exploitation. Such development poses challenges, but viable proposals may also present huge opportunities for the Aboriginal Nations that are impacted. Impact assessment can help Aboriginal Peoples to evaluate the pros and cons of development proposals and can allow for planning the transitional measures required for them to benefit from viable proposals. If Canada accepts that viable Aboriginal Nations must be a permanent part of the Canadian landscape, as I assert should be the case, then impact assessment is one essential tool, but not the only one, for choosing among alternative futures for aboriginal societies.

To illustrate this, I draw upon the example of my people, the Crees of James Bay, Quebec, and our experience with development and with the impact assessment procedure set out in the 1975 James Bay and Northern Quebec Agreement.

Appendix: Opening Plenary

IMPACT ASSESSMENT AND MINING LIBERALIZATION: PERSPECTIVES FROM TANZANIA

Professor Raphael Mwalyosi

Despite the absence of EIA legislation and institutional framework, impact assessment has been applied in Tanzania largely on ad-hoc basis for over 20 years. Since the first EIA in the 1980s, several have been undertaken including in the mining sector. In Tanzania, significant mining started in the 1990s following the trade liberalization policy. Gold mining is concentrated in three main areas: Lake Victoria greenstone belts, Mpanda mineral fields and Lupa gold fields. Diamond has been mined for over 50 years and more than 300 kimberlite pipes extend from Mwanza through Shinyanga to Tabora and Singida. Coloured gemstones are also mined extensively. In the past, environmental management in mining has been hindered by lack of coordination, insufficient funding and expertise. As a result there has been uncontrolled extraction of minerals and the use of unsafe mining methods and severe environmental damage and appalling living conditions in the mining communities. The challenges associated with the mining sector today in Tanzania is ensuring sustainability and integrating environmental and social concerns into mineral development programmes. Sustainable mining development requires balancing the protection of the flora and fauna and the natural environment with the need for social and economic development. In view of these challenges, the government's policy for the mining sector development aims at attracting and enabling the private sector to take the lead in exploration, mining development, mineral benefication and marketing. The role of the public sector will be to stimulate and guide private mining investment by administering, regulating and promoting the growth of the sector. To address the problems associated with mining, the Government's policy is to reduce or eliminate the adverse environmental effects of mining, improve health and safety conditions in mining areas, and address social issues affecting local communities. EIA is recommended as one of the major tools for achieving these solutions. Although EIA will soon be a legal requirement in all development activities including mining, achieving the set objectives may take many years before the necessary EIA culture and relevant institutions to coordinate and manage the mining environment is built.

IAIA'04 Canada

Hosted by the
Canadian Affiliates of IAIA

IAIA
WESTERN & NORTHERN CANADA

OAIA
ONTARIO ASSOCIATION FOR IMPACT ASSESSMENT

ASSOCIATION QUEBECOISE POUR L'ÉVALUATION D'IMPACTS

IAIA
International Association for Impact Assessment

International Headquarters (HQ)
1330 23rd Street South, Suite C
Fargo, ND 58103 USA
+1.701.297.7908 Phone
+1.701.297.7917 Fax
info@iaia.org
www.iaia.org

2005 IAIA Special Activities

IAIA'05 Annual Conference Event: 31 May - 3 June
Ethics & Quality in Impact Assessment
Boston-Cambridge, USA

IAIA SEA Conference: 27-29 September
Prague, Czech Republic