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

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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

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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

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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

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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

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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

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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?

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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

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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?

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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

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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

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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

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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

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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

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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?

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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

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"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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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?

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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©

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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

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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

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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

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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

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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

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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)

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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

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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

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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

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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

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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

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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

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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

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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

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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)

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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

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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

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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

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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?

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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

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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)

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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

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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

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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

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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

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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

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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?

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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

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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

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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

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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)

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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)

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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

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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

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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)

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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)

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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)

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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)

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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)

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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

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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

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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

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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

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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

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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

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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?

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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

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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

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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

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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?

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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

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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?

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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?

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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

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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 mobility.

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

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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

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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 enterprises, (2) assess nature-based and