agricultural tourism demand, and (3) estimate local and statewide economic impacts of nature-based and agricultural tourism. This paper reports on the first phase of the research " a statewide survey of nature-based and agricultural tourism enterprises. A broad spectrum of enterprises offering a variety of activities and services were included in the study, including farm and ranch-based activities, wildlife viewing, birding, hunting and fishing, hiking, biking, and similar activities. A mail survey of nature-based tourism enterprises elicited a variety of information including services provided, activities offered, business characteristics, and customer characteristics. The survey findings not only will provide important benchmark information about the enterprises that make up this emerging sector but also will provide critical input for future project phases. Results of the study can be used by both private and public entities to identify opportunities for potential expansion of the tourism sector, particularly nature-based tourism, in North Dakota.

Key words: *nature-based tourism, economic development, North Dakota*

SUSTAINABILITY ASSESSMENT FOR PROJECTS AND OTHER BUSINESS DECISIONS IN SHELL CANADA

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Shell Canada has had a sustainable development (SD) policy and commitment in place since 1990 and SD performance has been reported publicly for twelve years. The company has a strong belief in the need to demonstrate that it is meeting broader sustainable development goals. This means looking to ways of integrating environmental, social and economic aspects across all business activities, from project opportunity screening and planning to implementation. It means being open and engaging with stakeholders. It also means addressing both short-term and long-term needs.

One important way of integrating SD into the planning stage for capital projects and other business decisions is to conduct sustainability assessments. A number of tools have been in regular use by Shell Canada that contribute to this process, such as internal HSE assessments, the application of an internal standard on product stewardship, and value assurance review and EIA for significant new projects. A new sustainability assessment tool has been developed using as a framework the seven SD principles described in the company's Commitment to Sustainable Development. In brief, this is an analysis of a project plan or proposal to determine how sustainable are its stated objectives, outcomes and overall goal. This may be gauged by the projects capacity for delivering economic, environmental and social benefits while controlling or avoiding/minimizing any negative impacts associated with its development, implementation and, ultimately its termination.

In its present form, the sustainability analysis tool has been used during the initial planning phase of a selection of projects/business decisions. The opportunity exists also to extend the use of this tool beyond project screening/planning to help measure sustainability during the life of actual business developments.

Key words: *sustainability analysis, project screening and planning, sustainable development*

BRIDGING THE GAP BETWEEN PROJECT ASSESSMENTS AND REGIONAL DEVELOPMENT DYNAMICS

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Major projects in the Canadian North are often initiated with the hope to attract follow-on development. For example, roads to mineral properties in remote areas open access and can thus attract mines, support services and communities. The challenge for environmental assessment (EA) practitioners is to adequately estimate "the cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out." [Canadian Environmental Assessment Act, Sec 16(1)a, and similar stipulations in legislative frameworks at other scales]. The concern for regional planners and the public is to balance the economic, environmental and social benefits and costs of development. This research aims to contribute to both of these agendas by providing a set of heuristics to estimate the cumulative impacts of a development project that incorporates regional dynamics and the broader agenda of sustainable community development. The methodology is based on the concept of a development project as an attractor to subsequent development. It involves an analysis of past projects, historical development patterns and the socio-economic and demographic impacts to northern communities. Heuristics include a classification of project attractor types, impact multipliers for each type, and algorithms for incorporating the interaction of competing projects and activities. The classification scheme will be based on the study of past

projects and development timelines, as well as on initial and cumulative impacts. Insights from the analysis can then be used to anticipate future development outcomes in a given context. We will demonstrate the value of this extension to standard EA practice through application to a case study in the Canadian Arctic.

Key words: *cumulative effects assessment, regional planning, socio-economic impacts, Canadian Arctic*

ADAPTING IMPACT ASSESSMENT TO ALTERNATIVE DECISION-MAKING CATEGORIES

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The logic of Environmental Impact Assessment (EIA) is to influence public decision-making by generating knowledge about external impacts of proposed projects. Such decisions encompass both projects approval and conditions to impose on the projects. The EIA system in general have achieved acknowledgement as an efficient tool for sustainable development. However, in several occasions and especially in controversial projects, the specific influence from EIA on decision-making seems to be insignificant. This paper tries to illuminate some possible explanations of this defect in regard to the prescribed influence of EIA.

The actual decision-making contexts represent one kind of explanation of lacking influence from EIA. These contexts vary between consultants performing the EIA, the developers and different public decision-makers. Examples of how this multiplicity setting and different linkage of decisions can affect the actual decision-making are described in order to illustrate this perceived defiance.

In order to get a more fundamental understanding of the problem, the EIA process is related to different public decision-making categories. These categories encompass among others negotiation, voting, administrative assessment, experiments and rule compliance. The mismatches between the logic of EIA and the empirically most relevant public decision-making typologies are then discussed. Emphasis is put on how the context (degree of political / professional conflict) can change decision-patterns. Five typical issue-specific decision-making processes from the EIA-process in the petroleum sector in Norway constitute the empirical basis for the analysis.

The paper concludes with ideas on how the EIA process and the EIS can adapt to specific decision-making typology and -context in order to be of greater importance for the decision-making and the decision-makers.
Key words: *decision-making, politics, environmental impact assessment, Norway, petroleum sector*

EVOLVING OPPORTUNITIES FOR THE COLLABORATIVE MANAGEMENT OF CUMULATIVE EFFECTS: THE OIL AND GAS INDUSTRY IN BRITISH COLUMBIA, CANADA

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The oil and gas industry in British Columbia, Canada, is rapidly emerging as a major supplier to North American energy markets. This growth has presented challenges to the management of effects on the environment and on traditional land use by aboriginal peoples, especially due to the exploration and production of natural gas in the northeast region of the province.

The management of cumulative effects in this region has become a priority for provincial regulators of the energy industry, and a concern to other land users. In meeting these challenges, recent initiatives have focused on the development of strategies to understand these effects and to manage them through various approaches, such as the use of thresholds and various effects management practices. While all of these practices require industry cooperation, some are evolving that incorporate a more regional and collaborative involvement by the various participants in land and resource use and management, including industry, government, regulatory boards, the public and aboriginal people.

This paper explores these opportunities, based on the authors' direct involvement in the ongoing development of these strategies and tools to manage cumulative effects in the region. Included are best practices such as joint development plans amongst various project operators, regional access management, and pre-tenure and regional plans. These and other initiatives are described, and their contribution to the management of regional effects explained. References to case studies are made, along with a long-term forecast of how these initiatives may evolve as the energy industry expands into unconventional energy reserves (such as coal bed methane) and offshore oil and gas development. The practical limitations and opportunities of industry involvement are emphasized in consideration of the balance between industry's risk associated with capital investment and due diligence in responding to "on the ground" and strategic sustainable business practices.

Key words: *cumulative effects, cumulative effects assessment and management, oil and gas, management tools, regional planning*

INTEGRATING SOCIAL AND ENVIRONMENTAL IMPACT ASSESSMENT: A PROPOSAL

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This paper defines and explores the relationship among key areas and sub-areas of environmental impact assessment (EIA), including among others: social impact assessment, strategic environmental assessment, cumulative effects assessment, public participation. A central thesis is that trends toward proliferation of specialty areas and their segmentation are caused not only by the growth and accompanying sophistication of the impact assessment field, but by unresolved and sometimes hidden confusion and disagreement over the concept of environmental "standing" and the relationship of environmental impacts to human concerns. The author attempts conceptual clarification as a means to push the field toward integrated approaches to EIA and its related components and enhance capacity building and effective application.

USE OF OFFSHORE WIND ENERGY IN THE GERMAN NORTH AND BALTIC SEA—CLIMATE PROTECTION VERSUS BIODIVERSITY?

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The German Government has set the target of doubling the share of renewable energies by the year 2010. Energy supply should be restructured and put on a sustainable foundation. Guaranteeing a reliable energy supply, profitability for both suppliers and consumers, and the protection of the environment and resources should all be treated with the same priority.
The subject of discussion about the construction of offshore wind energy farms in the Geman North and Baltic Sea is their contribution to the climate protection. On the part of nature conservation the possible contradiction between offshore wind energy plants and the protection of biodiversity is pointed out. "The Strategy of the German Government on the use of off-shore wind energy" aims at creating the necessary preconditions on the supply side that will allow for a rapid construction of offshore wind farms. Furthermore it envisions to solve the existing conflicts between the protection and use of resources.
A research team, conducted by the Technical University Berlin, worked on soltutions for adapting the environmental instruments providing the precautionary principle as well as the impact assessment itself to the licensing procedure of offshore wind energy plants. The aim of the project was the development of these instruments in such a way that an effective application as well as an optimised consideration of the needs of the marine environment are supported.

The presentation focuses on the evaluation of the significance of impacts on the marine environment due to offshore wind farms as the most important step subject to the EIA. As an example the findings relevant for evaluating the "harassment and/ or displacement of harbour porpoises due to construction noise" as well as the "displacement or collision of seabirds" are illustrated.

Key words: *renewable energies, offshore wind energy, resources, climate protection, biodiversity, precautionary principle, environmental instruments, impact assessment, EIA, evaluation of the significance of impacts, marine environment*

EVALUATING AND COMMUNICATING IMPACT SIGNIFICANCE IN EIA: A FUZZY SET APPROACH TO ARTICULATING STAKEHOLDER PERSPECTIVES

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Decisions that surround the evaluation of the significance of environmental impacts are a critical component of EIA, with implications for all stages in the process. Despite this, significance evaluation arguably remains one of the most complex and least understood of EIA activities, involving a combination of technical "scientific" approaches to appraisal situated within a political decision making arena, characterised by value judgements and case-specific interpretations.

EIAs typically use natural language terms, e.g., "slight," "moderate," or "substantial" to communicate impact

significance. Whilst pragmatic, this raises the problem of lexical uncertainty, and such terms in themselves may be contested - one person's "slight" impact is another's "substantial." Secondly, ES authors could manipulate the definitions of impact significance to their advantage. Thirdly, sharp 'black and white' boundaries between impact categories are often used that do not reflect the actual 'shades of Grey,' e.g., 100 traffic movements are a "slight" impact but 101 movements are classed as "moderate."

Focussing on noise and visual effects for a live windfarm EIA, this paper explores the use of fuzzy set theory for establishing and communicating impact significance across different stakeholder groups. Research participants were exposed to a series of (i) computer-animated photomontages and (ii) various sound recordings of actual similar wind-turbines in operation, and were asked to grade the extent to which the impact matched their assessment of a "slight" impact, a "moderate" impact, etc. Fuzzy sets representing these linguistic terms were subsequently calibrated against relevant corresponding continuous variables (e.g., dB(A) for noise) to 'map' the boundaries of impact significance.

Differences in stakeholder assessments of impact significance are outlined, before considering how individual stakeholder fuzzy sets may be used to define significance thresholds to guide the EIA process. Finally a critical evaluation of the approach is provided and its potential wider applicability considered.

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Key words: *impact significance, fuzzy sets, stakeholder perspectives, noise, visual impacts, windfarms*

HOW URBAN ENVIRONMENTS CAN CONTRIBUTE TO INCREASED PHYSICAL ACTIVITY

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The city of Voorhout is a rapidly growing city in the Netherlands. During the coming years two new districts will be built and the number of inhabitants will increase from 14.000 in 2002 to 20.000 in 2010. The local authority is of the opinion that health should be taken into account in building the two districts. The local authority has recently published a Memorandum on Public Health Policy in which physical activity is one of the spearheads. Physical inactivity is associated with a high blood pressure, coronary heart disease and diabetes mellitus. Studies show that incorporating physical activity in day-to-day routines is the most effective way to maintain or increase it. A living environment which makes physical activity appealing is therefore important. A safe environment is an important condition for physical activity. In cooperation with the municipality of Voorhout we developed a manual for building districts which enhance safety and physical activity. The manual contains points of interests for healthy neighbourhoods. Furthermore the manual gives a step-by-step plan for the use of the manual in the municipality. To draw up a manual that can and will be succesfully used in the municipalities:

- we make an analysis of the administrative context in which the manual is used
- we conduct a process evaluation in order to get information for improving the manual
- and last but not least we conduct an indepth stakeholder analysis

Key words: *health impact sssessment, living environment*

SUSTAINABILITY IMPACT ASSESSMENT OF WORLD TRADE NEGOTIATIONS: CURRENT PRACTICE AND LESSONS FOR FURTHER DEVELOPMENT

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Sustainability Impact Assessment (SIA) is an increasingly accepted form of strategic impact assessment, and has recently been adopted, for example, as the preferred method of ex ante policy assessment in the European Community. A methodology for SIA for application to

international trade policy measures was developed by IDPM in 1999, and since then has been used in conducting an

ongoing SIA study of the WTO trade negotiations agenda. This paper will review the past four years' experience in carrying out SIA of trade policy, and will identify the main difficulties and challenges that have arisen in its application. The main lessons for the further development of the methodology will then be discussed.

INCREASING CITIZEN INVOLVEMENT IN SUSTAINABILITY-CENTRED ENVIRONMENTAL ASSESSMENT FOLLOW-UP

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In Canada, many project proponents and planners in the public and private sectors are required to forecast and minimize the adverse environmental effects of their undertakings. However, environmental assessments have traditionally been weak in the areas of planning and conducting effective monitoring, encouraging public participation, integrating social and environmental considerations, encouraging environmental rehabilitation and enhancement, and examining cumulative effects of multiple projects. This paper attempts to address these deficiencies by drawing from theory and practice in the areas of citizen monitoring, sustainable livelihoods, and local knowledge. Based on case study research in several regions of Canada, this discussion compares the outcomes of particularly innovative initiatives with conventional arguments for increasing local involvement in environmental assessments. Opportunities and challenges are presented with respect to integrating local and conventional (or scientific) knowledge systems, addressing concerns about credibility and bias between citizens and project proponents, and contributing to broader sustainability goals such as increased stewardship and civility. Potential benefits of broadening the temporal, geographic, and topical scope of environmental assessment follow-up activities are also discussed. Finally, some ideas for coordinating and funding integrated and participatory monitoring programs are suggested. The resulting recommendations call for a dramatically different approach to follow-up activities on the part of private and public project proponents, as well as novel thinking for environmental assessment practitioners.

Key words: *environmental assessment follow-up, citizen participation, integrated approaches*

THE KANANASKIS 2002 G8 SUMMIT - A CASE STUDY IN STRATEGIC ASSESSMENT AND SUSTAINABLE DEVELOPMENT IN A PROTECTED AREA

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When Canada's Prime Minister announced the 2002 G8 Summit would be held in Kananaskis Country in Alberta, immediate concern arose for the potential adverse environmental impact that might result to this cherished area. Recent meetings of world leaders had been beset by violent protest disturbances that damaged local environments egg. Seattle, and this concern greatly intensified after the New York terrorist attacks on 11 September 2001. Security arrangements involved about 9000 Canadian soldiers and police officers with terrorism response and riot enforcement capability -- the largest peacetime security operation ever undertaken in Canada.

For the first time ever, a Director of Environmental Affairs was appointed to participate in planning the G8 Summit 2002. Canada's Department of Foreign Affairs and International Trade prepared a Strategic Environmental Assessment of the overall project to identify sensitive species, spaces and times and to inform all other planning.

The G8 Kananaskis 2002 Summit environmental program had five major components:

1. Environmental Planning and Impact Assessment
2. EnviroSafe Training
3. Green Meetings
4. Outreach and Consultation - Envirostakeholders
5. Environmental Legacy

About 350 G8 staff members were individually informed and trained regarding their personal responsibilities to make good stewardship choices to achieve a Green Meeting. An EnviroSafe program instructed several thousand soldiers and officers about how to conduct their outdoor duties in a manner that kept them safe from harm by natural hazards, and conversely, how to safeguard the environment from their presence and activities. The public stakeholder outreach program presented G8's stewardship commitment and techniques by way of dozens of lectures, a G8 website and a news publication mailed monthly to 33,000 addresses. Both tangible and intangible benefits were realized - mainly that the natural and social environment of Kananaskis Country was protected - there is virtually no residual evidence the meeting ever took place.

Key words: *protected recreation area, world leaders, riots and terrorism, strategic assessment, sustainable development*

SEA AND SAEMANGEUM RECLAMATION PROJECT

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Saemangeum reclamation project, which aims to build 33-kilometer long sea-dike, the longest in reclamation history, in the west coast of Korean peninsula was initiated in 1987 as a presidential-election campaign pledge. The economic feasibility and environmental impact affecting the fishery and tidal-land were questioned from the very beginning of the project. The protests from the environmental groups to stop the project have partly succeeded twice, first in 2000 and second in 2003. Now the sea-dike is almost completed except for two narrow waterways, and the inside tidal-land is deteriorating. The EIA was carried out in 1987 very briefly without considering the importance of tidal-land contributing to fishery and purification of water pollutants.

SEA is not included in the process of EIA in the present environmental law system in Korea. This paper presumes that SEA is compulsory and reviews the reclamation project, following the stepwise processes of SEA. It was found out that the budgetary waste and public division surrounding the reclamation project might have been evaded, if this SEA had been tried before the project started.

Key words: *strategic environmental assessment, reclamation project*

A SIGNIFICANCE OF STRATEGIC ENVIRONMENTAL ASSESSMENT FOR DAM CONSTRUCTION IN KOREA

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Dam construction has faced serious concerns due to large scale damage to natural ecosystem. In the process of dam construction, Environment Impact Assessment (EIA) requires site preparation, justification of development, and counter-plan of environmental impact that should be considered in the upper administrative scheme. This delays the dam project, and eventually hinders proper and effective management. This study aims at an alternative plan that will eventually improve the evaluation process of EIA and pre-EIA of dam construction. For a dam construction there are four administrative steps: 1) Long-term plan for dam construction, 2) Designation of future dam construction site, 3) Basic plan for dam construction, and 4) dam construction. For a long-term plan for dam construction, an environmental consideration is minimal due to lack of pre-EIA consultation. In the 2) and 3) processes even though environmental consultation is legally secured, site justification and alternatives are not seriously considered. However, in the EIA designation site and basic plan of construction, including detailed evaluation of environmental impact, are considered. A clear distinction between pre-EIA and EIA is necessary. This resulted in large conflict between developers and conservationists, and often failed to harmonize ecosystem destruction and opinion of stakeholder. To solve these problems, it is necessary to adopt Strategic Environment Assessment (SEA) that enables considering environmental impact from the beginning stage of policy formation for individual projects. Strategic Environment Assessment allows us to overcome the difficulties of site selection by absorbing opinion of stakeholder, and harmonize the uppermost limit of EIA that considers alternative plan and mitigation. Second, SEA enables helping development sustainable by evaluating cumulative impact on a large scale. Consequently, we should bring SEA to solve the problems of pre-EIA and EIA by changing legislation, system and management.

Key words: *strategic environment assessment, dam construction, environment impact assessment, Korea*

THE BIODIVERSITY ASSESSMENT FRAMEWORK: BIODIVERSITY AND CORPORATE SOCIAL RESPONSIBILITY

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The Netherlands Ministry of Environment initiated the development of an "assessment framework for biodiversity." The objectives of this project are to be better able to assess the quality of the numerously appearing codes, labels, methods, etc. (benchmarking) and to invite the private sector to transform their policies and operations towards more sustainable practices (economic, environmental and social = PPP) by providing tools to companies that have corporate social responsibility on the agenda. The framework is a generic guidance model for the private sector on how to better integrate biodiversity considerations into day to day business operations. It provides an overview of the steps needed to put biodiversity on the agenda, taking into account the objectives of the international Convention on Biological Diversity (thus including conservation ánd sustainable/equitable use of biodiversity). The framework makes use of CBD's Ecosystem Approach, it's draft guidelines for sustainable use of biodiversity and it's guidelines for biodiversity in EIA and SEA (prepared by IAIA's biodiversity section). Companies, sector organizations and the like can use this guidance framework to develop their own company or sector specific tools. The framework contains an initial set of task-oriented modules for analysis of products and production processes and for eco-labeling.

A number of Netherlands-based multinationals intend to apply the framework to some of their activities on a pilot basis. At the time of writing the framework is being finalised and real-life follow up pilots are being identified.

Key words: *biodiversity, corporate social responsibility, private sector, CBD*

IMPLEMENTING SUSTAINABLE STRATEGIES FOR RURAL LAND USE PLANNING AND RESOURCE MANAGEMENT OF PUBLICLY OWNED ASSETS: AN ANALYSIS OF ENVIRONMENTAL ASSESSMENT SYSTEMS BEING DEVELOPED BY THE BRITISH COLUMBIA MINISTRY OF SUSTAINABLE RESOURCE MANAGEMENT

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The paper examines efforts to develop a land use planning and resource management system for rural and remote regions of northern British Columbia (BC), Canada, that incorporates sustainability precepts and environmental assessment procedures. Since their election in 2001, the BC Liberal government has undertaken a comprehensive review and re-organization of the delivery of provincial government services. In his 2003/4 to 2005/6 Service Plan, Premier Gordon Campbell articulates a new sustainability vision for the province: A strong and vibrant provincial economy; A supportive social fabric; and Safe, healthy communities and a sustainable environment. Within the sphere of a sustainable environment, the new Ministry of Sustainable Resource Management (MSRM) is responsible for strategic plans and policies regarding the sustainable management of Crown land and water resources. The goals of the new MSRM include: the sustainable economic development of land and resources; effective delivery of integrated, science-based land, resource and geographic information; and sound governance of land and resource management. The MSRM is taking up these new responsibilities within an environment of limited staff resources, conflicting land resource users, and a poorly performing provincial economy. The paper reviews the evolution of this land use planning and resource management system, identifies opportunities to improve the system by introducing strategic EIA processes, and delineates lessons-learned over the past three years. One unique element of the planning process is involving the participation of First Nations. The authors encourage an interactive session, with the audience sharing their experiences in developing environmental assessment methodology for rural land use planning systems that embrace indigenous land rights.

Key words: *rural land use planning system, natural resource management, environmental assessment, systems*

IMPACT ASSESSMENT OF INDUSTRIAL PROJECTS IN QUÉBEC: WHAT THE LAST EIGHT YEARS HAVE TAUGHT US / L'ÉVALUATION ENVIRONNEMENTALE DES PROJETS INDUSTRIELS AU QUÉBEC : QU'AVONS-NOUS APPRIS EN HUIT ANS ?

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In February 1996, following a modification of the regulation, major industrial projects, mines and gas pipelines were subjected to the Southern Québec environmental assessment procedure. Prior to that date, authorization of industrial projects did not involve public participation. Since then, few projects have gone through our procedure, which

is aimed at the very large industry. The process is generally perceived by new proponents as time consuming, and, since industrialists are notoriously shy about revealing their plans in advance, many make use of legal loopholes or dimension their project so it is under the threshold at which it would become subject to the procedure. However, the proponents whose projects underwent environmental impact assessment found that the process enabled them to realize a better impact statement and, ultimately, a project that was more easily integrated to its biophysical and social environment. We will see how this modification in the approval process of major industrial projects has changed the assessment of these projects. With public participation, proponents have felt the pressure to be more open and straight-forward about their projects. We have learned that public involvement plays an important role in the decision-making process, encouraging on industrial proponents to install the latest treatment technologies, establishing the first links between the industry and its future neighbours and even helping local contractors in obtaining building contracts. The role of the different actors in the procedure will be discussed: the proponent, the agent of the environmental authority, the neighbouring population, the environmental groups and the media.

Key words: *public perception, industrial projects*

ENVIRONMENTAL MANAGEMENT TOOLS TO IMPROVE THEORY AND PRACTICE OF EIA

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EIA is well developed in theory and practice and is widely used. However, while there are still improvements that can be made within EIA (Cumulative Assessments, SEA, SIA), EIAs can be improved by using other environmental management tools to support and enhance the EIA. EIAs will be improved if the institutions and corporations involved use an Environmental Management System. This paper will discuss a set of 22 environmental management tools and a subset of 11 tools that can be used to enhance EIAs or appear to hold the most potential to do so. Strategic Environmental Management and Planning (including governance) sets goals and objectives and guides the institutions involved. Good governance is very important. Environmental Policies stipulate the actions that will be taken to improve environmental performance. Environmental Auditing, after the EIA ensures that goals and objectives are being met. Education and Training are essential for effective implementation. Risk Management provides assurance to stakeholders. Environmental Indicators and Environmental Reporting (with external verification) prove to stakeholders that goals and objectives were met. Environmental Accounting and Life Cycle Assessment identify costs and benefits over the life of the project. Environmental Communications is essential to keep stakeholders informed. Purchasing Guidelines reduce upstream impacts. The roles, or potential roles for these tools in improving the effectiveness and efficiency of EIAs will be discussed. Some practitioners advocate expanding EIA to include the functions of some of the tools listed above. The folly of trying to make one tool do everything - the Swiss army knife approach - is that it may do many things, but may not do them well. Therefore, careful refinements of EIA remain important for continual improvement of that specific tool. However, using a set of specifically designed and increasingly standardized tools will produce better results than the Swiss army knife approach.

Key words: *environmental management systems, environmental management tools, auditing, life cycle assessment, environmental indicators and reporting, external verification, governance*

DEVELOPING INDICATORS FOR MONITORING SUSTAINABLE TRANSPORT AND MOBILITY

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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, to define a set of outcomes from the transport system that can help policymakers monitor progress towards sustainable transport and mobility, and to assess policies designed to achieve this objective. Quite often "outcomes of interest" (e.g., air pollution) cannot be directly observed. Related outcome indicators are therefore defined that can be measured or estimated (e.g., emissions). Determining the outcomes of interest and the associated outcome indicators is the subject of this paper. Quite often the outcomes are limited to environmental impacts and the indicators are influenced by data availability. SUMMA covers all three dimensions of sustainable development (economic, environmental, and the often neglected social dimension) and the impact of the transport system on them. The result is a much more complete list of outcomes of interest and associated indicators, some of which might not be measurable (yet). The idea is that data for these indicators might be able to be collected in the future. In fact, the results of the project might stimulate the collection of some of these data. This paper describes how we related the EC's definition of sustainable transport and mobility to outcomes of interest and presents the set of outcome indicators that we designed for each of the outcomes.

Key words: *indicators, sustainability, transportation*

COURSIER DAM DECOMMISSIONING AND ENVIRONMENTAL RESTORATION

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Coursier Dam was located in an isolated mountain valley in the Monashee Mountains, approximately 30 km south of Revelstoke, B.C., Canada. It was a 19 m high earth fill dam located at the outlet of Coursier Lake Reservoir which provided upstream storage for the 8 megawatt B.C. Hydro Walter Hardman Hydroelectric Generating Station. Coursier Dam had a long history of dam safety incidents and remedial repairs. These deficiencies included piping and seepage at high reservoir levels, elevating the potential for Coursier Dam to fail. B.C. Hydro considered a full range of risk control options, ranging from a comprehensive rebuild to decommissioning. As a result of these analyses, B.C. Hydro decommissioned the dam in 2003 to eliminate the risk of dam failure. The decommissioning consisted of excavating a notch through the center of the earth fill dam and moving approximately 100,000 cubic meters of material. The environmental assessment process involved consultation and cooperation with First Nations, public and natural resource regulatory agencies. The restoration objective was to return the area to its natural state. An outflow stream channel was designed and constructed at the approximate location of the original creek bed and Coursier Lake was returned to its original historic elevation, reducing the surface area from approximately 200 ha to 40 ha. Revegetation plans include riparian planting and reforestation to return the previously inundated area to its naturally vegetated condition. This paper will discuss the environmental impact assessment and planning, environmental management and protection during decommissioning and the post decommissioning environmental monitoring program.

Key words: *dam decommissioning, environmental assessment, environmental management*

IMPROVING EIA PROCESSES IN DEVELOPING COUNTRIES: CASE STUDY OF THE PERUVIAN MINING INDUSTRY

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During the 1990s, as Peru regained political stability following the suppression of the Shining Path terrorist movement and implementation of neo-liberal policies, mining firms began to move to Peru. Mining has unique and substantial potential for environmental degradation. However, adverse impacts can be controlled through effective EIA. Peru has reasonably well developed, substantive EIA legislation. However, as with EIA processes in most countries, the Peruvian EIA processes require improvements. Five specific areas requiring improvement are discussed: a) provisions for cumulative impact assessment; b) provisions for public participation; c) the administration of Peru's EIA regime; d) separation of the responsibility for EIAs from the Ministry of Energy and Mines, which is responsible for promotion of mining; and e) building capacity in Peruvian universities to produce the EIA expertise required. These improvements would enhance the contribution of mining to Peru's sustainable development. Ross and Thompson provided guidelines to conduct a sound EIA, including cumulative effects assessment, public involvement, and human resources. Creasey analyzed the

role of the government, in terms of policy development, to reduce the incremental effect of individual projects. Gordon outlined the importance of capacity building within educational institutions as key element to conduct EIA. This paper analyzes the Peruvian EIA regime that applies to mining projects and explores ways to improve it. The six main findings are: a) capacity building within educational institutions play important roles to improve the EIA process; b) enhance capacity and requirements for cumulative impact assessment, c) EIA processes in Peru will be improved only through improved human resources and support for them within government organizations; d) separation of responsibility for mining EIAs from the Ministry of Energy and Mines to improve governance; e) improved public participation by both mining companies and government organizations; and f) requirements for post EIA follow up - monitoring, auditing, and reporting.

Key words: *Peru, mining, improvements to EIA, public participation, governance, EIA follow up, cumulative impact assessment*

ENVIRONMENTAL IMPACT ASSESSMENT AS MANAGEMENT TOOL FOR PROTECTED AREAS IN CANADA AND MEXICO

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Environmental assessments are a planning and management tool that allows the examination of the likely impacts that development projects may have on the human or biophysical environment. Although Environmental Impact Assessments (EIA) were introduced into the environmental legislation of various countries since the early 1970's, it was not until 1988 that EIA was introduced into the first Mexican Environmental Law (Ley del Equilibrio Ecologico y Proteccion al Ambiente). This paper is divided in two sections. The first section compares the current legal instruments that regulate EIA practice both in Mexico and Canada. It presents the different definitions of environmental impact and the types of assessments recognized in each country. The second section deepens into how cumulative impact assessments are being used as a planning and management tool for protected areas in both countries. In Canada, evaluating cumulative effects has been a requirement for more than 10 years. The Canadian Environmental Assessment Act requires evaluating the cumulative effects that are likely to result from a project in combination with other present or foreseeable projects or activities. However, cumulative effects are not considered in the Mexican Environmental Law and the concept was recently introduced into EIA regulations in 2002. The paper presents the results of interviews with protected area managers and a revision of environmental assessment reports of public and private development proposal that affect protected areas in Mexico, and provides recommendations for improving the usefulness of EIA and Cumulative Impact Assessment as a planning and management tool for protected areas in this country.

Key words: *environmental impact assessment, cumulative impact assessment, legislation, protected areas, Mexico, Canada*

AN INCLUSIVE FRAMEWORK FOR ENVIRONMENTAL IMPACT ASSESSMENT

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Human impact assessment is an area of active interest among impact assessment practitioners and researchers, and it is increasingly broadening in scope and application. Understanding the links between human health and the environment is relatively easily done, provided the concept of health is limited to only physical well being. However, health has been defined by the World Health Organization not as the mere absence of disease but as "a state of complete physical, mental, and social well being." This broader definition implies recognition of the many determinants of human health—including the state of the economy, family harmony, community coherence, cultural and leisure activities. This understanding of the concept of human health is being adopted by many governments, and incorporated into impact assessments. Clearly, the costs and benefits of development activities, in terms of human health, should be part of the impact assessment process. The link between health and the environment is not at issue; the challenge is how to best achieve that integration given the legal and institutional basis of the Canadian Environmental Assessment Act. There are cost implications and methodological challenges, and there may also be policy and political ramifications. We propose a framework for impact assessment that will incorporate a holistic concept of human health and impacts, and that will address these challenges. The framework will be applied in the Canadian context, and will be adjusted to the different levels of assessment as defined in the Canadian Environmental Assessment Act, specifically with regard to scope of assessments, identifying and scoping health issues, and public participation requirements.

Key words: *human health, impact assessment, Canada*

A COMPARATIVE STUDY OF ENVIRONMENTAL IMPACT ASSESSMENT OF DIFFERENT TYPES OF HYDROPOWER PLANTS. (FEASIBILITY ASSESSMENT OF PUMPED STORAGE AS AN ALTERNATIVE TO OTHER TYPES OF HYDROPOWER PLANTS WITH AN EMPHASIS ON PRIVATE OWNERSHIP ISSUES)

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Different types of hydropower plants are being utilized in the country's power sector taking environmental, financial, technological and institutional aspects into policy making and planning considerations. Reservoirs, flow storage and pumped storage are identified as three operational types of hydropower plants that generate economically valued electricity during the pick hours. These power plants have different environmental impacts depending on their technical specifications and the environmental setting they are located in. In this study six hydropower plants of three types were selected and their different aspects of environmental impacts were analyzed. Comparing the environmental impacts of first type (Karoon 5, Karoon 4, Karoon 3, Roodbar Lorestan reservoirs) and the second type (Godar Landar) with the third type (. Siah Bisheh) shows that the negative environmental effects of the first and second types of hydropower plants are much more diverse, frequent and significant than those of the third type, which is basically due to high volume of reservoirs and the vast affected areas of first and second types.

The change in reverie ecosystems, altering the natural land forms and consequently inundation of lands and properties owned by the local settlers are considered as the most significant impacts of the power plants of first and second types. Taking theses impacts in mind, the use of pumped storage as an alternative to the first and second types of hydropower plants in the countries with the capacity of power generation during the non-pick hours, could be a proper solution to saving the potential affected areas and prevent emergence of any likely conflicts due to the lose of private lands. A network of pumped storage can also be utilized in a basin, which significantly can reduce most of the negative impacts of hydro power plants of first and second types. In this paper the environmental impacts of three types of hydro power plants are compared to assess the feasibility of replacing the first and second types by pumped storage plants.

Key words: *environmental impact assessment, pump storage, private ownership, hydropower plants, geographical potentials*

INTEGRATING CLIMATE CHANGE CONSIDERATIONS INTO ENVIRONMENTAL ASSESSMENTS OF HYDRO-ELECTRIC POWER PROJECTS IN EASTERN AND NORTHERN CANADA

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This research project investigated the merits and justification of whether greenhouse gas (GHG) climate change considerations should be integrated into environmental impacts assessments of hydro-electric projects in the north and east of Canada. To this end, research was conducted on basin hydrology and river flow for several Canadian drainage basins in northern Manitoba (Grass River), Newfoundland-and-Labrador (Eagle River) and Québec (Grande-Baleine, Vermillon and Sainte-Marguerite), for two time slices, one current (1961-1990) and one future (2040-2069). The methodologies used consisted of coupling downscaled temperature and precipitation outputs of two atmosphere-ocean general circulation models (AOGCM), one Canadian (CGCM 1) and the other British (HadCM3) to the Thornthwaite water budget (Grande-Baleine, Grass River, Eagle River) and the Streamflow Synthesis and Reservoir Regulation (SSARR) hydrological model (Grande-Baleine, Vermillon and Sainte-Marguerite). The results show that in general, the timing of peak spring discharge occurs earlier by a few days to more than a month, changes in total discharge volume, phase shifts of river discharge and increased inter-annual variability of discharge, depending on river basin and climate scenario. However, given the high level of uncertainty of climate scenarios, it is judged that it may be premature to integrate climate change considerations into environmental assessments of hydro-electric projects. All the same, climate change and variability may significantly influence the practice of environmental impacts assessments.

Key words: *climate change, environmental assessment, hydro power projects, streamflow, Canada*

PROCESSING OF ENVIRONMENTAL FUZZY INFORMATION (PEFI)

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Actually, in developed countries as well as in the others, environmental impact assessment becomes of great interest. Many factors lead to such interest, like sustainable development, economy, pure ecology, etc. In any case of environmental impact assessment (EIA, EISA, ...) information quality and its processing is the most important factor. This is the case in the strategic environmental impact assessment studies where the information available or estimated is often fuzzy. To solve such problem, we developed a new technique for data possessing. This technique will be applied to a case study of SEIA for a program and comparison of environmental impacts of industrial projects in Morocco. The benefits of our approach are evaluation of environmental impact for two projects on the basis of the information available and about the same item, i.e., water, air, soil. Naturally, if one try to compare projects on the basis of all aspects together, introduction of a contribution parameter for each item is suitable. Such contribution is chosen on the basis of importance given to the item, its hierarchy, etc. Let's consider two different programs (or industrial projects), P1 and P2 for which the investment costs are C1 and C2 respectively. Such projects also will have environmental impacts, that we illustrate with and biological pollutions, given here as example. The global environmental impact or environmental disturb of such program is given by comparison (Euclidean distance in the present case) of each program to the ideal one. Thus program or industrial project P2 seems to be the one having lowest environmental impact than P2.

Key words: *ecoefficiency, fuzzy data, EIA, industry, SEIA*

MEASURING SUSTAINABLE PRODUCTION

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Section III of the Plan of Implementation from the Johannesburg's World Summit on Sustainable Development 2002 calls for the development of a 10-year plan to accelerate the shift towards sustainable consumption and production. A necessary component of this is to insure that, at a minimum, the sum impacts from all human actions fall within earth's carrying capacity to manufacture, power and sequester these activities. Although methodologies exist to determine a sustainable and equitable maximum amount of Earth's resources per individual (the ecological footprint concept), devising a means to assign these parameters to the businesses that create these goods and services has, until now, not yet been developed.

This paper offers a preliminary method to meet this challenge through a 3-step process. Step 1 equitably allocates to an individual corporation their share of biophysical resources (land, air, water, ocean) relative to their financial contribution to world revenues. Step 2 determines a corporation's actual consumption of resources through a Life Cycle Analysis of its production, with results expressed in biophysical units of land, air, water and ocean. Step 3 compares the allocated amount of land, air, water and ocean to the organization's actual consumption of these biophysical resources to both establish a tangible sustainability goal and determine the corporation's present level of sustainable production.

Utilization of this methodology offers corporations a tool to:

- Establish a definitive goal for attaining ecological sustainability in simple and easily understood terms
- Prioritize efforts for attaining sustainability
- Realize market advantage
- Benchmark efforts
- Gain leadership recognition
- Earn credibility through measuring their part in achieving total sustainability

Key words: *sustainable development, production, corporate responsibility, footprint, carrying capacity, distance-to-target, nature's interest, Johannesburg's World Summit, sustainable consumption and production*

AN ANALYTICAL ASSESSMENT OF INCLUSION OF THE ENVIRONMENTAL AND SOCIO-ECONOMIC STRATEGIES IN THE PROCESS OF ENVIRONMENTAL IMPACT ASSESSMENT OF WATER RESOURCES AND POWER DEVELOPMENT PROJECTS

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Environmental impact assessment can be defined as a process to identify and assess various positive and negative impacts of a specified project on physical, ecological as well as socio-economic settings of the affected environment. This process generally uses a system of impact evaluation and ranking/weighting for assessment purpose taking in to consideration the interactions among impacts of the project's activities, as the evaluation criteria, and the environmental setting. The evaluation system compares the impacts and their significance using a normalized system of impact categorization and with respect to a number of criteria, which in many cases are different in terms of their measurement units. Apart from technical, environmental and social aspects, which are essential components of an environmental evaluation system, different strategic approaches of the regional and/or local decision making bodies to the environmental and socio-economic impacts of a definite project is a major concern that affects the results of environmental assessments.

Experiences from environmental impact assessment of six water resource and power development projects in the country (Shamil & Neiyan Dams, Siah Bisheh pumped storage, Hormozgan, Esfahan and zanjan gas power plants, and Neka combined cycle power plant) shows that the current ranking system of impacts is not sufficient to properly balance the negative ecological/phisical and positive socio-economic impacts of the projects. This finally results in improper judgments on the environmental feasibility of the projects in question, which is mainly due to the strong importance given to the positive socio-economic effects in the regional development strategies comparing them with the negative ecological and physical impacts. On the other hand, sever negative environmental impacts are very likely to occur as a result of ineffective or inapplicable auditing, monitoring and control systems being used by the relevant authorities, which leads to irreversible environmental degradation in a long term process. This requires the country to adopt and apply appropriate methods to evaluate, weight and assess the impacts or to make necessary modifications in the existing EIA techniques and approval process. This paper aims at to analyze the existing EIA process from methodological point of view and to provide the relevant responsible authorities with recommendations to compromise and include both the environmental and socio-economic strategies in the process of preparation, evaluation and approval of environmental impact statements.

Key words: *environmental impact assessment process, strategic environmental assessment, socio-economic impacts, water management, energy development projects, regional water and energy development strategies, environmental monitoring*

AIDING THE ENVIRONMENT: DOES AusAID'S EMS HELP TO GREEN THE AID INDUSTRY?

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The spread of Environmental Impact Assessment systems throughout the 'developing' world was largely stimulated by the requirements of major donor countries and multilateral agencies that made EIA a condition of aid. Since at least the eighties it has been increasingly realised that EIA has been largely seen as a one off hurdle to be 'gotten over' and not as an integral or strategic part of aid project and program management and delivery. The costs, both in human and financial terms, of unsustainable aid which degrades ecological systems, undermines social systems and imposes mounting financial costs on aid projects is unknown, but significant. In Australia, the Environmental Protection and Biodiversity Conservation (EPBC) Act requires that Australian overseas aid which may have significant impacts on the environment be referred to the Department of Environment and Heritage for assessment. This has provided an added impetus for AusAID (the national aid agency) to enact its own Environmental Management System (EMS) to ensure that the environmental impacts of aid are addressed early in the project cycle and whenever possible mitigated and managed within the Agency as part of its project cycles. The AusAID experience with the development and implementation of an EMS within an aid agency has important lessons for other donor agencies, and for countries who receive aid. The assessment framework has a number of components relevant to: contracts, environmental reporting, impact assessment, quality assurance, environmental capacity building, and environmental compliance with national and international laws and agreements. This paper will critically review AusAID's experience with implementing an EMS, and the lessons for the aid industry.

Key words: *environmental management systems (EMS), environmental aid, environmental impact assessment (EIA) project cycle, environmental governance*

SOCIAL IMPACT ASSESSMENT IN THE MAHAKAM DELTA

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Les découvertes d'huile et de gaz faites dans les années 70 par la compagnie Total ont conduit à lancer des développements industriels pour des productions actuelles de l'ordre de 400 000 boe / jour. Parallèlement, la crise économique de 1997 en Indonésie a poussé les populations du delta à s'engager dans des développement locaux avec l'aquaculture et les cultures de crevettes. Ce développement, qui couvre maintenant l'essentiel de la surface du Delta entre en compétition avec les installations pétrolières et leur fonctionnement. Une étude d'impact a été réalisée pour mesurer les difficultés à coexister (activités de pêche versus activités de développement et de production) et définir quelles mesures prendre pour atténuer cette cohabitation, en d'autres termes comment concilier les activités industrielles avec celles des communautés locales.

Mots-clés: *production industrielle, activité communautaire, cohabitation, évaluation des impacts, mesures d'atténuation*

THE SEA EFFECTIVENESS CRITERIA AND PRINCIPLES IN ITALY

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Several sets of SEA effectiveness criteria and principles have been identified in order to support SEA practitioners worldwide and to further develop SEA in general. The international literature has also portrayed benefits of SEA that may result if they are effectively implemented. It may be hypothesised that the political benefits of SEA should automatically result if the criteria and principles for effectiveness are adapted. But is the capacity of SEA to result in its benefits directly related to those effectiveness criteria portrayed in literature? Furthermore, it is also assumed that elements and criteria might in effect not be fully applicable to all planning systems, but only to varying degrees and that system specific SEA elements must be identified in differing context to guarantee an effective outcome. Given the presence and degree of validity of the basic SEA elements, are the SEA benefits achievable in all planning contexts and to which degree? And are there any unexplored benefits? Using Italy as a case study, the applicability of SEA effectiveness criteria and principles will be tested.

Key words*: SEA effectiveness criteria, SEA benefits, Italy*

REVISIONING THE PLACE OF PUBLIC PARTICIPATION IN ENVIRONMENTAL ASSESSMENT LAW

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This paper offers an evaluation of the legal provisions for public involvement in Canadian EA law and suggests needed reform to ensure that participatory activities are meaningful. The literature on public involvement provides the evaluative criteria and document review, semi-structured interviews and key informant input provide insight into legal reform. Reform in the way of essential components covering issues such as access and purpose, notice, access to information and the provision of resources is considered. As well, reforms related to process activities are suggested that consider issues such as the timing of involvement, two-way exchange of information, power balance and decision accountability.

Key words: *public involvement, EA law*

EVALUATION DE L'IMPACT DES EAUX USÉES ET INDUSTRIELLES SUR LE COMPORTEMENT ÉCONOMIQUE ET SANITAIRE DE LA COMMUNAUTÉ DES MZAMZA. PROVINCE DE SETTAT. MAROC

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Au Maroc l'agriculture est l'activité économique numéro un et consomme presque 86% du volume d'eau utilisée au Maroc. Les autres secteurs comme l'industrie et les ménages consomment, respectivement 8 et 6%. Les superficies irriguées sont en augmentation. Ainsi, d'ici l'an 2025 les besoins en eau doivent augmenter de 38% pour satisfaire l'irrigation. Les apports des pluies sont en diminution et ne suffisent déjà plus pour les besoins des nappes souterraines qui ne se sont plus rechargées. Au contraire ces nappes souffrent d'une surexploitation provoquée par les pompages excessifs. L'utilisation non contrôlée des eaux usées en irrigation n'est pas exempte de risques sanitaires. En effet, la pollution permanente liée aux rejets liquides domestiques et industriels véhicule des éléments toxiques et des facteurs de maladies infectieuses dangereuses. Les métaux sont aussi à l'origine des contaminations des sols, des chaînes alimentaires, des eaux souterraines et des eaux de surface. Ainsi, la dégradation de la qualité des eaux a suscité des investissements publics énormes en matière de contrôle, d'assainissement et de pré-traitement surtout en milieu urbain. Le milieu rural n'a pas attiré l'attention comme il se doit, les problèmes liés à la qualité de l'eau et ses effets sur la santé y sont peu abordés. L'application de l'approche écosanté à travers un projet de collaboration entre l'INRA et le CRDI impliquant des médecins et des spécialistes de l'environnement, a permis de dégager l'importance de la prise en ligne de compte l'ensemble des composantes de l'écosystème dans l'analyse du comortement sanitaire et socio-économique des communautés rurales. Les membres de la communauté ont pu développer des mécanismes et un mode de vie assez particulier pour limiter les effets néfastes des eaux usées et même proposer de nouvelles alternatives

institutionnelles et économiques pour assurer le bien-être des membres de la communauté.

EVALUATION OF FORESTRY PROGRAMS AND POLICIES IN MEXICO: THE EXPERIENCE OF THE NATIONAL FOREST COMMISSION

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The forested regions of Mexico, comprising approximately 55 million hectares, are home to 12 million people, living in poverty for the most part. Of the total forested area, 80% is under communal property, 15% under private ownership and only 5% belongs to the nation. In order to alleviate poverty, improve productivity and sustain the viability of forest ecosystems, the Federal Government has implemented several programs. However, impact assessment is performed only on infrastructure projects and not on agricultural or forest policies, as is the case in many other countries. Programs and policies designed to achieve forest sustainability, improving environmental conditions and livelihoods in forests are not subject to an ex ante impact assessment and are only reviewed after their implementation, with the limited data on impacts available after a few months. In Mexico, the National Forest Commission has commissioned three external evaluations of their forest programs, covering the period 1997 - 2002. These programs are dedicated to reforestation, commercial tree plantations, natural forest enhancement for productive uses, and support for native and communal forest management. These evaluations lack adequate tools for translating resources invested in terms of actual environmental, social, technological and economic impacts and suffer from limited and, oftentimes, distorted information from the beneficiaries and other stakeholders. So far, the results of the evaluations range from performance appraisals to opinion surveys, resulting in insufficient criteria to modify the country's long term strategic forest programs. A policy impact assessment mechanism and a reform of the evaluation approach are proposed to enhance the way subsidies and other forms of support are designed, monitored and evaluated. This should contribute to ensure that economic resources dispensed by the Federal and State governments are used in a rational, useful way to reduce deforestation and degradation of forest resources, while providing decent alternatives for forest dwellers.

Key words: *forest policy assessment, sustainable forest development, ex post evaluation*

COMPARING THE GERMAN, DANISH AND DUTCH INSTITUTIONAL STRUCTURES FOR INVESTMENT IN TRANSPORT INFRASTRUCTURE AND DEVISING THE IDEAL MODEL BY CONSULTING EXPERTS AND PRACTITIONERS

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In this paper, a stylized composition is made of the institutional structures as they exist for decision-making on transport infrastructures as they exist in Germany, Denmark and Holland. They are compared on four relevant aspects: 1. Role of CBA in the process, 2. Role of EIA in the process, 3. Role of pressure groups in the process and 4. Role of various government tiers in the process. On all four characteristcs of the institutional structure, Germany, Denmark and The Netherlands have different scores.

Subsequently, results are given from a survey held among Dutch experts and practitioners on the issue whether they would like to see German and/or Danish elements introduced in their own system. They were also asked to express how they thought changes in the institutional structure would affect various aspect of the quality of decision-making and what their ideal institutional model looks like.

Key words: *institutional structure, investment in transport infrastucture, German, Danish and Dutch models, hybrid profiles, expert opinion, ideal model*

ESIA—MORE THAN A TICK IN THE BOX?

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Integrated environmental and social assessment is increasingly becoming part of national regulatory approval processes, to estimate and manage the impacts of oilfield developments upon the natural and human environment. Even at pre-project stages, the Environmental and Social Impact Assessment (ESIA) can form part of the company decision-making process for country entry. The ESIA should not be

viewed however simply as a regulatory 'tick-in-the-box.' Effective integration of the ESIA findings, into the engineering design process can deliver benefits in impact mitigation and environmental management across all stages of the development. The international community is demanding increasingly rigorous environmental and social assessments of planned developments by international operators and reputation can be strongly influenced by the consistency and quality of the assessment process and the extent to which ESIA commitments are delivered. The OGP ESIA in Projects Taskforce has been formed to develop industry guidance, which will be applicable to development projects in any geographical area, thus facilitating the attainment of a consistently high standard by all operators, to align itself with international expectations. The aim is both to add technical value and to facilitate interactions with stakeholders and third parties. Given the diversity of project specifics, company internal processes, local environmental sensitivities etc., the approach must offer a high degree of flexibility in its application. 'Building-blocks' based on agreed 'good practice' to be assembled as appropriate, are viewed to offer greater potential than a more rigid process. In addition to direct application to oil and gas developments, extrapolation to downstream projects is possible. A workshop was held in November 2003 to share experie8nce through 'lessons-learned.' It provided a means of achieving consistency in delivery of high quality environmental and social impact management. More are planned.

Key words: *better value, consistency, alignment, OGP*

SCREENING FOR CORPORATE SOCIAL RESPONSIBILITY (CSR) ISSUES IN DUE DILIGENCE

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Environmental due diligence assessments provide an indication of environmental liability and historical contamination 'within the fence line.' However they do not address ongoing operational issues, community relations, management quality, and broader reputational issues that may affect value. Recent studies have shown that these 'intangibles' may account for a high proportion of company value. Changes in corporate governance standards mean that disclosure of such information is frequently included in general disclosure clauses in sales/purchase agreements.

This paper describes an approach that extends due diligence to provide additional information on issues that may have a material impact on the current and future value of assets and ongoing operations, including:

- Environment, health and safety
- Social and ethical issues
- Corporate governance and business practice

The approach described has been used successfully to provide a broader view of current and potential future liabilities that may affect the value of commercial and industrial properties.

Key words: *corporate social responsibility, due diligence, environment, health and safety, social*

MINING DEVELOPMENT PROJECTS AND THE ENVIRONMENT THE AFRICAN EXPERIENCE

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Industrial activities depend on natural resources; one of which happens to be the mining industry. This industry continues to play a major role in the economic sector of most developing countries, particularly, Africa. Today, other than the agricultural sector, large and small-scale mining still play a significant role in the overall socio-economic and physical infrastructure development of these countries.

The activities of National and Trans-national Corporations (TNCs) in the mining sector have made major impacts on the economies and employment generation of most African Countries, through technology transfer and mining ventures. However, environmental damages have thus far been generally overlooked. This need is receiving a tremendous amount of attention in light of attempts to include environmental considerations into every aspect of the socio-economic development plans and policies of African Developing countries.

In view of the fact that trans-national and national corporations will continue to play key roles in the development of mining vestures in developing countries, African countries are applying sufficient attention to the environmental aspects of mining activities undertaking by TNCs, by developing Environmental Policies and Guidelines and by conducting Environmental Impact Assessments (EIAs) studies prior to exploitation and development of these resources.

The African Development Bank as a development partner, finances mining projects in its Regional Member Countries (RMCs). Against this background, it has developed Mining and Industrial Policy Guidelines which are utilized when preparing and appraising projects.

Because project-specific environmental impact assessments are not adequate instruments for addressing impacts at the policy, plan and program (PPP) levels, and are unable to address cumulative impacts, the Bank has been committed to introducing Strategic Impact Assessment (SIA) Guidelines to be used as a systematic process in addressing the environmental consequences of proposed policy, program or plan initiative of multinational projects including mining, so as

to ensure that they are fully included and appropriately addressed at the earliest stage of decision-making on par with social and economic considerations.

Environmental and Social Assessment Procedures (ESAP) have also been developed by the Bank so as to reflect the more integrated environmental and social approach in addressing cross-cutting themes. The guiding principles of the ESAP is to ensure that the Bank's policy, program and plan have been designed to make them environmentally and socially sustainable, involving stakeholder participation and timely disclosure.

RECOMMENDATIONS FOR THE INTEGRATION OF STRATEGIC ENVIRONMENTAL ASSESSMENT IN THE PROCEDURE OF THE GERMAN FEDERAL TRANSPORT INFRASTRUCTURE PLAN

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A research team, conducted by the Technical University Berlin, worked on solutions for the integration of Strategic Environmental Assessment (SEA) in the German transportation planning system. The objective was to elaborate technical and methodological opportunities for the implementation of the SEA Directive.

The present process of the Federal Transport Infrastructure Plan is a complex project assessment procedure to investigate the necessity and urgency of single infrastructure projects. For the implementation of a sustainable transport policy with an integrated SEA in the future, this approach should be modified. What is required is a more extensive, more conceptually oriented 'Federal Transportation Development Plan,' which does not only include single projects, but also presents basic alternatives.

The research team has created a draft of an overview for the integration of SEA in the elaboration procedure of the Federal Transport Infrastructure Plan. In addition, suggestions are made for the carrying out of consultation on a national level. In terms of content and technical tasks, the research project has developed methods for the analysis and assessment of the current status of the environment, of significant effects on the environment, and of alternatives dealt with in the context of annex I lit. b, c, d, e, f and h of the SEA Directive. How can this environmental information be investigated on a national and comprehensive stage? The IAIA conference presentation will illustrate solutions to this question with corresponding technical and methodological approaches.

THE SHIFTING PARADIGM OF IMPACT ASSESSMENT AND MITIGATION: THE EMERGENCE OF VOLUNTARY IA AND MITIGATION

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Much of impact assessment (IA) is project oriented and required by legislation. However, more and more of IA in Canada today is sector oriented and has companies making entirely voluntary commitments. This presentation provides a general overview of frameworks that mobilize industry into voluntarily mitigating adverse environmental effects and improving environmental performance. It looks at industry-led and Canadian government-led frameworks (Responsible Care, Towards Sustainable Mining, Agriculture Policy Framework, etc.). It pays particular attention to the drivers of industry's engagement, the difficulties of engaging small and medium-sized enterprises, the achievements of particular initiatives, and how some frameworks are evolving into regimes of self regulation and environmental stewardship. Its theme is: voluntary IA and mitigation has emerged to be of at least equal importance to legislatively-based IA. This "paradigm shift," which has been little noticed, has important public policy implications for other jurisdictions and countries.

AN ADAPTIVE IMPACT ASSESSMENT APPROACH: THE PEACE RIVER PROJECT

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Shell Canada's Peace River Complex is a heavy oil production facility that has existed on the site for more than 30 years. As part of an initiative to maximize production, Shell sought regulatory approval for a production increase that included additional land disturbances. An EIA was required by regulatory agencies in support of the commercial application. Detailed baseline environmental programs provided information on the type and distribution of unique, uncommon or valued environmental components in the

project area. The distribution of these components was presented as constraints maps (using GIS software), which were provided to the engineering design team. Environmental components were prioritized in terms of sensitivity to disturbance and known ecological importance. The resulting project design met business objectives yet mainly avoided disruption to environmental components identified as important in the baseline studies, thus minimizing project impacts. Detailed descriptions of the remaining impacts of the project on these important environmental components became the focus of the impact assessment.

This integrated constraints mapping approach differs from the more routine impact assessment approach, within which a project design derived independently of the environmental programs is superimposed upon environmental baseline maps, and impacts are calculated with minimal or no consideration for movement or alteration of project components. This approach resulted in (1) a project design that presented the least risk and extent of significant environmental effects, and (2) an EIA in support of the project that focused on the most significant impacts resulting from development (the disturbance of important environmental components). Early integration of mitigative measures into project design, such as avoidance of important or sensitive environmental components to the extent possible, is a key principle in responsible ecosystem management and sustainable development.

Key words: *impact assessment, constraints mapping, ecosystem management, sustainable development*

TOWARDS AN ENVIRONMENTAL IMPACT ASSESSMENT FOR THE MACKENZIE GAS PROJECT: OPPORTUNITIES, CHALLENGES AND LESSONS LEARNED

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The Mackenzie Gas Project (MGP) plans to develop the three largest discovered northern onshore natural gas fields in the Mackenzie River delta area of northern Canada and transport the gas by pipeline to southern markets. The project is composed of five separate components; three field developments including: Niglintgak, Taglu and Parsons Lake. A gathering pipeline system within the Mackenzie delta for gas and natural gas liquids, and a gas transmission pipeline system down the Mackenzie river valley from Inuvik in the Northwest Territories to northern Alberta. The gas and will then enter existing transmission pipelines in Alberta. The MGP is being developed by five organizations including Imperial Oil Resources Ventures Limited (Taglu), the Aboriginal Pipeline Group (transmission pipeline), ConocoPhillips and ExxonMobil (Parsons Lake) and Shell Canada Ltd. (Niglintgak). The project is to be constructed from 2006 to 2009 with start up in 2010.

The MGP is subject to a complex regulatory regime involving twelve separate regulatory agencies with jurisdictional authority and fourteen federal government departments with potential regulatory authority for EIA. A cooperation plan has been developed by the regulators in an effort to provide a framework for a coordinated EIA review process for the MGP. The Cooperation Plan provides for a two-year public review process for the MGP from 2004 to 2006.

An omnibus Environmental Impact Assessment (EIA) that will assess all the previously mentioned MGP components is currently being prepared by Imperial Oil on behalf of the proponents. The EIA is a substantial undertaking that involves two years of environmental baseline data collection and one year of time to prepare eight volumes of documentation. The EIA consultation team consists of a consortium of four environmental consulting firms with approximately 150 contributing professionals. The approach to the EIA is community focussed and includes the integration of current EIA methodology with the unique requirements of the Canadian north including the important social and economic impacts and the use of traditional knowledge in EIA.

The paper, as the tile suggests, will chronicle the development of the EIA for the MGP and will discuss the unique aspects and lessons learned from of this important environmental assessment.

Key words: M*ackenzie Gas Project, northern Canada, oil and gas development, social and economic impacts, traditional knowledge and EIA*

ENHANCED PUBLIC PARTICIPATION IN EIA PROCESS IN NEPAL

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Nepal started conducting EIAs of major infrastructure projects such as road, hydroelectricity, and industries through policy formulation in early 1980s. In 1993, the Government endorsed the national EIA guideline and its use was ramified to prepare and approve EIA reports of the prescribed projects. Recognising the importance and benefits of EIA, the Environment Protection Act (1996) and Environment Protection Rules (1997) were enacted which include over 200 projects of different size requiring either IEE or EIA. The environmental law also includes details on approval process for IEE and/or EIA including Scoping Document and Terms of Reference.

Nepal underscores the importance people's participation, as a key element, in EIA system. The proponent is required to publish a 15-days public notice in the national newspaper before the submission of the Scoping Document for approval of each project requiring EIA study in order to ensure that concerns and issues of the stakeholders and affected people are adequately addressed by the EIA study. After the preparation of the draft EIA report, the proponent must conduct a public hearing at the project site. Furthermore, the competent authority - the Ministry of Population and Environment - must publish a 30-days public notice before the approval of EIA report of any sector to provide stakeholders additional opportunities for comments and suggestions on the final EIA report. As of December 2003, Nepal has approved about 24 EIA reports of various sectors.

This paper will examine people's participation, time taken, legal process, and inputs of the stakeholders during the preparation and approval of EIA reports of the hydropower projects, and industries developed by the private sector. It will also examine practices, problems faced, people's empowerment, challenges and opportunities in expanding public participation in impact assessment process in Nepal.

Key words: EIA, *public participation, hydropower, industry*

SPATIAL PLANNING GUIDANCE FOR ACHIEVING SUSTIANBLE URBAN DEVELOPMENT

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Sustainable planning guides are being developed to direct planning both at the local and regional levels towards sustainability. However, due to the multifaceted nature of spatial planning, different guides do focus on different aspects of planning and tend to overlook or put less emhasis on other aspects. The goal of achieving susutainability through spatial plannig requires that integrated sustianble guidance which will incoroporate all aspects should be developed. The paper discusses the current framework of sustainable spatial planning in Saudi Arabia. It highlights the need for better planning guidance and proposes general guidelines in view of current international practices. The guidelines are very perinent at this time as many municipal master plans are being reviewed for many cities in the Kingdom of Saudi Arabia.

Key words: *sustainable development, spatial planning, strategic planning, Saudi Arabia*

INTEGRATED IMPACT MONITORING FOR INDUSTRIAL AREA: KERTEH MALAYSIA

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As part of the Environmental Impact Assessment approval conditions, all petrochemical plants including in Kertih Industrial Area are required to conduct environmental impact monitoring that comprises air quality, noise, soil and inland waters. Each plant monitors the impact from its plant operation without considering a combine effect from neighbouring plants. PETRONAS Research & Scientific Services Sdn. Bhd (PRSS) proposed to Department of Environment (DOE) to initiate an integrated monitoring programme to enable the overall impacts from all the plants in the industrial area be monitored and controlled in a most effective manner. The success of the proposed integrated monitoring programme is dependent on cooperation and dedication of plant owners and Department of Environment. The advantages of the integrated programme are: accumulative impacts from all the plants operation to environment can be modelled and analyzed to assess the state of the environmental conditions of the area and providea a basis for a later action programme; all data and information obtained can be shared by all the plants and Department of Environment (DOE) and relevant authorities for decision making in future Kerteh land use and planning; and related issues and concerns can be discussed and solved between the plants and DOE; and it promotes local environmental management alliance. The programme has a comprehensive scope of works. A baseline study for the area covers air quality, noise, soil, groundwater and surface waters performed. A database on existing environmental quality, site characteristics, pollution pathways, environmental hazards and risk to health and geographical information system for the area were established for designing a most effective programme. The program has been implemented for two years and proven effective minimizing impacts to environment and cost saving.

Key words: *accumulated impact, integrated monitoring, cost effective*

CASE STUDY: ENVIRONMENTAL MONITORING USING REMOTE OPTICAL SENSING [OP-FTIR] TECHNOLOGY AT AN INDUSTRIAL WASTEWATER TREATMENT PLANT

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During production and maintenance operations at Tinker Air Force Base in Oklahoma City, Oklahoma, industrial wastewater streams are generated which contain organic and heavy metal compounds. These waste streams result from chemical depainting operations, chemical cleaning processes, and electroplating operations. Processes discharging wastewater are treated at the on-site industrial wastewater treatment facility [IWTF]. Regulatory reporting mandates require identifying volatile organic compound emission sources, estimating emissions from the IWTF, quantifying ambient air concentrations surrounding the facility via air dispersion modeling, and evaluating computer-generated numerical concentration estimates with respect to discontinuous field data and an open-path optical remote monitoring system. The objective of this paper is to compare three strategies for meeting air quality management requirements: (1) use of a coupled model [air emission model and air dispersion model]; (2) use of air quality monitoring data collected via discontinuous air sampling and analysis [i.e., periodic canister monitoring]; and (3) use of air quality data generated by open-path optical remote monitoring using Fourier Transform InfraRed Spectroscopy [OP-FTIR]. Validation of the predictive accuracy of the three strategies will be made based on (a) comparisons and statistical testing of receptor location predictions with air quality data from periodic canister monitoring, (b) comparisons and statistical testing of predictions along the open path optical remote monitoring boundary line with measured concentrations based on OP-FTIR; and (c) comparisons and statistical testing of pertinent field canister monitoring data with open-path monitoring results.

Key words: *industrial wastewater treatment, OP-FTIR, open-path*

HEALTH RISK ASSESSMENT AT AN INDUSTRIAL WASTEWATER TREATMENT PLANT

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During production and maintenance operations at the Oklahoma City Air Logistics Center [OC-ALC], industrial wastewater streams are generated which contain organic compounds [primarily phenol and methylene chloride]. These streams result from both direct and indirect contact with organic compounds via chemical depainting operations, chemical cleaning processes, and electroplating operations. Organic materials in the combined wastewater are treated at the on-site industrial wastewater treatment facility [IWTF] with unit processes including open surface basins. Some of these treatment processes result in the release of semi-volatile and volatile organic compounds [VOCs] from the wastewater to the ambient air. Because emitted VOCs can create potential health risks for treatment facility workers and the general public in the immediate surrounding areas, Tinker AFB is required to quantify [and report] VOCs released into the atmosphere. Such regulatory reporting can encompass identifying VOC emission sources, estimating emissions from the IWTF, quantifying ambient air concentrations surrounding the facility via dispersion modeling, and evaluating computer-generated numerical concentration estimates with respect to discontinuous field data and an open-path optical remote monitoring system. The focus of this paper is to identify and quantify health risks associated with phenol and methylene chloride releases surrounding the IWTF. The risk assessment will include calculation of an equivalent human dose [based on animal mortality studies], the maximum risk for individuals in the general population, excess number of cases of cancer, the average excess number of cases of cancer generated per year, and loss of life expectancy for the general population.

Key words: *industrial wastewater treatment, health risk assessment*

COMPUTER MODELING OF AIR QUALITY IMPACTS RELEASED FROM AN INDUSTRIAL WASTEWATER TREATMENT PLANT

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Coupling of an appropriate source emissions model and an atmospheric dispersion model represents a cost-effective and environmentally-responsible approach for meeting impact prediction and regulatory reporting requirements, as well as problem analysis and pollution prevention needs, associated with emissions of two chemical depainting agents [phenol and methylene chloride] from a liquid industrial wastewater treatment facility [IWTF]. This coupling study was conducted for the IWTF at Tinker Air Force Base [AFB] in Oklahoma City, Oklahoma. Phenol and methylene chloride are used as chemical depainting agents at the AFB, with the liquid effluent from such uses ultimately subjected to an on-base IWTF. Atmospheric emissions of the depainting agents occur from various unit processes in the IWTF. Use of the coupled model in the predictive mode is illustrated via the development of geographically-based profiles of the ground-level concentrations of phenol and methylene chloride in the surrounding environment of the IWTF. Model validation is

demonstrated via comparisons and statistical testing of receptor location predictions with actual air quality data developed from discontinuous air sampling and analysis. Finally, it will be emphasized that the coupled model can be used for: the conduction of site specific health risk assessments; emissions reporting regulatory compliance determinations; and evaluation of the air quality impacts of on-base process change scenarios, pollution prevention activities, and changes in the design or operation of the IWTF.

Key words: *industrial wastewater treatment, computer modeling*

POLLUTION PREVENTION SUCCESS STORIES AT TINKER AIR FORCE BASE, OKLAHOMA

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The Oklahoma City Air Logistics Center's [OC-ALC] Pollution Prevention Program is simple, direct, and fundamental: reduce the purchase and use of targeted toxic chemicals. OC-ALC has become the Air Force leader in introducing new prototype technologies into all maintenance processes and quantifying their environmental benefits. The innovative technologies are reducing the handling of hazardous materials and eliminating hazardous waste. The OC-ALC pollution prevention program involves efforts to reduce the use of wastes through a hierarchy of actions. The actions are as follows: source reduction, chemical substitution, recycle and reuse, treatment, and disposal. At the root of the program is a compliance site assessment that identified four major processes in aircraft depot maintenance activities [painting, depainting, cleaning, and electroplating] that generates the majority of the center's hazardous waste streams. Purchase and use of hazardous chemicals are tracked to verify the validity of implemented technologies and monitor trends. The objective of this paper is to highlight technologies that have reduced targeted hazardous chemical purchases by 1,500,000 pounds, reduced the generation of hazardous industrial waste by 8,000,000 pounds, and reduced the use of ozone depleting substances [ODSs] by 330,000 pounds, annually. This paper will discuss the following technologies: abrasive carbon dioxide blasting, environmentally-acceptable chemical depainting agents, radome chemical depainting, medium pressure water jet knife, high pressure aircraft component subsystem, advanced vapor degreaser, NESHAP-compliant wipe solvents, powder coatings, and alternative electroplating technologies [i.e., ion vapor deposition, high velocity oxygen fuel, electromagnetic particle deposition, etc].

Key words: *pollution prevention*

COMMUNITY-BASED IMPACT ASSESSMENT NETWORK FOR EASTERN AFRICA: TRAINING OF TRAINERS GUIDE ON COMMUNITY BASED ENVIRONMENTAL ASSESSMENT AND SOUND DESIGN FOR SMALL SCALE ACTIVITIES

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Small-scale activities are currently the focus of many development and donor agencies projects in poverty alleviation and sustainable development in developing countries. Despite this shift, unlike large scale projects with the greatest threat to the environment hence wide availability of materials detailing methodologies, framework, principles and techniques, small scale activities have inadequate resource materials and framework for assessment hence limitation in the application of lower level environmental and social safeguards processes.

A consortium of organizations in East Africa interested in CB impact assessment known as the Community Based Impact Assessment Network for Eastern Africa (CIANEA) has with support of ENCAP/REDSO program and SEI-B/Tellus Institute just concluded the development of training of trainers materials for application in small scale activities and in effect conducted the first regional training of trainers course on environmental assessment and sound design for small scale activities in East Africa in Nairobi, Kenya.

This presentation discusses the content of the three separate but complimenting training materials (ToT guide, Best Practice and Source Book) as well as their potential role and application in CDD and lower level environmental and social safeguards projects implemented by institutions like World Bank, European Union, Governments and USAID among others. The relationship of the developed materials to SAIEA's current program on EA and public participation for the SADC countries will also be discussed as well as its overall contribution to the CLEIAA EA and M capacity building strategy.

Key words: *Community Based Impact Assessment Network for Eastern Africa, community based impact assessment, CDD, social funds, training of trainers, CIANEA guide, best practice, sourcebook, Southern African Institute for Environmental Assessment (SAIEA) World Bank, Capacity Development and Linkages in EIA in Africa (cleiaa)*

HIGHWAYS AGENCY ENVIRONMENTAL PERFORMANCE: ABOVE THE WATERLINE

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The Highways Agency (HA), an Executive Agency of the UK's Department for Transport, is responsible for operating, maintaining and improving the strategic road network in England. Performance indicators have been developed that measure the HA's delivery of the UK Government's objectives for transport. The HA has advice and procedures for environmental survey, assessment and reporting informing and influencing road scheme design through the entire project planning process from conception to implementation. Regulators, interested parties and society have the opportunity to contribute to impact assessment and influence the project appraisal findings. To date, beyond informing design and investment decisions on individual projects, little use has been made of the growing database of project appraisal information. Furthermore, despite environmental indicators having a strong correlation with the delivery of desirable outcomes, the business has focussed on output measures delivering targeted positive interventions. This paper outlines a proposal for better data analysis and the development of outcome environmental performance measurement within the HA illustrating the extent to which appraised proposals coming forward are addressing the delivery of environmental sub-criteria. When viewed over a number of years, this will illustrate the business' environmental performance trend. The primary objectives of the proposals are to derive an approach embracing the whole canvas of the HA's works on the network: environmentally targeted investments; overall performance of road improvements; and, long-term prudent custody of the highway. To report predicted environmental impacts of all improvement schemes, there are inordinate ways in which appraisal data could be analysed and viewed. Careful selection of graphics can be used to convey quite complex messages interested stakeholders. This paper, by drawing on the appraisal of HA's major improvement programme and local network schemes, illustrates the concept of performance against a "waterline" and explores future business monitoring applications.

Key words: *performance indicator, appraisal, environmental impact assessment*

BETTER STAKEHOLDER INVOLVEMENT THROUGH MULTI-ATTRIBUTE DECISION ANALYSIS

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Corporations today are faced with increasing demands by government and civil society for more public involvement in corporate decisions, particularly during the impact assessment process on new projects. Stakeholder consultation and participation, in addition to fulfilling regulatory requirements, can be valuable for building constructive relationships with communities of interest and thereby reducing social risk for projects. Public participation in decisions that affect them is an integral part of progressing towards sustainable development. However, experience has shown that involving stakeholders in decisions at the project assessment stage often requires them to have a high level of technical knowledge. Also, the process, although well intentioned, is frequently complicated by hidden agendas and past conflicts. My presentation will discuss how the field of decision analysis, and in particular multi-attribute approaches such as multiple accounts analysis (MAA) and multi-attribute tradeoff analysis (MATA) can provide a constructive, technically-sound means of involving stakeholders in decision making. These methodologies emphasize explicit characterization of values and objectives and can provide a framework for capacity-building and interest-based rather than positional dialogue, as well as an efficient means of allocating impact assessment resources. My focus will be on application of these approaches in the mining industry although I will also draw on experience of other natural resource industries. Case studies of successful application of these approaches will be presented. I will also suggest how these innovative methods could be further employed, as well as their strengths and drawbacks, based on preliminary results from my thesis research at a northern Canadian mine.

Key words: *decision analysis, stakeholder consultation, mining, public participation*

INTEGRATED APPROACHES TO SUSTAINABILITY ASSESSMENT

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This paper outlines research on a model for Integrated Sustainability Assessment (ISA). The model combines 20 key elements of sustainability assessment into a workable sustainability framework.

The model was applied in the assessment, generation and modification of 12 sustainability projects. The projects involved the sustainability assessment of proposals by managers acting on behalf of a local government authority. The managers were provided with training in an integrated thinking methodology for sustainability assessment and given the necessary tools for that assessment. In assessing the projects, they were asked to consider all 20 elements in the integrated model.

The findings were that when confronted with the choice between changing their existing thinking or changing the integrated model, some of the participants undertaking the assessments consciously or unconsciously altered the assessment tool, and therefore altered the outcome of the assessment processes. Omission of one or more elements from the integrated model created distinctly different outcomes in the assessment process.

From the project proposals assessed, 20 distinctly different forms of sustainability assessment were identified as being theoretically possible, one resulting from the omission of each single component of the integrated model.

The paper describes the 20 components used in the ISA process, provides a definition of each component, explains the reason for the necessary inclusion of each, the effect if omitted from an ISA process, and the descriptive labels for the 20 conceptual types of sustainability assessment identified.

The aim of this research is to make conscious the unconscious decisions made in structuring sustainability assessment processes to include or exclude different elements, thereby making transparent the different ways of approaching sustainability assessment. The model presented, in describing an ISA framework, provides a new categorisation as a way of assessing the appropriateness of different forms of sustainability assessments from an integrated perspective.

Key words: *sustainability, integrated sustainability assessment, ISA, local government, assessment framework, governance, TBL, government assessment , private sector proposals*

FROM MINIMAL DAMAGE TO NET CONTRIBUTION: MINING'S SEVEN QUESTIONS TO SUSTAINABILITY

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Over the past decade, much effort has been applied to linking sustainability concepts with impact assessment techniques. The result is a shift from an emphasis on "mitigation of significant adverse environmental effects" to demonstrating a "positive contribution to sustainability." This paper examines the nature and implications of this change.

Interestingly, events in the mining industry have played a leading role in developing and testing these ideas. In 2001-2, a multi-interest working group was brought together under the aegis of the Mining Minerals and Sustainable Development project and asked to develop a set of practical principles, criteria and indicators that can be used to assess the performance of individual, existing or proposed operations in terms of their compatibility with the concepts of sustainability. The starting point for this effort was 10 pieces of relevant work, including two landmark environmental impact assessments - the Voisey's Bay and Tulsequah Chief mining projects.

The result of this effort is the Seven Questions to Sustainability (7QSD), a robust, dynamic framework for assessment in which questions are asked and the responses obtained compared to ideal or desired answers. At the base of this approach is the question "Is the net, long term contribution of a project/operation to people and ecosystems, positive or negative?" From this opening a plethora of further questions cascade down in seven broad areas that address relationships (a process of engagement), the ultimate ends (people and the environment) and the means to achieve these ends (economy, non-market activities, institutional arrangements and governance) and, finally, overall integration and continuous learning.

Although the source of this work is the mining industry, applications described in this paper also include forestry, aquaculture, fisheries, community development, aid and relief programs, and the management of protected areas. Together, these cases demonstrate the power and generic nature of this framework.

Key words: *impact assessment, contribution analysis, mining, sustainability*

WHOSE WASTE IS IT ANYWAY?

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The importance of the Lord Howe Island Group was recognised with its inscription on the World Heritage List in 1982 for its outstanding natural values. With 105 endemic

plants, the islands support extensive colonies of nesting seabirds and at least 168 bird species have been recorded either living at, or visiting, the islands. A number of these are rare or endangered. The waters surrounding Lord Howe provide an unusual mixture of temperate and tropical organisms. The coral reef is the southernmost in the world and provides an example of the transition between coral and algal reefs. Historically, settlers made a living by hunting, fishing and growing vegetables, fruit and meat for trade with passing ships. Today tourism dominates the local economy. The existing landfill covers approximately 2 ha immediately behind Lagoon Beach, west of the airport and south of the settlement. Historically waste was tipped and burnt in-situ. More recently combustibles were incinerated daily in a cage, with solid waste stockpiled separately and periodically burnt. The resulting ash (and metals) was buried in a nearby swale, with putrescibles buried adjacent and septic sludge in soakage pits along the dunes. The Lord Howe Island Board cares, controls and manages much of the islands. The Board, together with the local Clean Up Australia Committee, proposed to develop a Waste Treatment & Recycling Facility. It was proposed to develop the facility at the existing landfill site, in the southern part of the settlement, near the lagoon. The Board and committee were concerned with the limited remaining area at the landfill, public health issues associated with landfilling, undesirable emissions and fire risk associated with daily incineration and potential impacts of leaching on the nearby lagoon. Commonwealth & state Approvals required an Environmental Impact Report, the preparation of which was begun in 1999.

Key words: *tourism, impact assessment, Lord Howe Island*

STATUS OF STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) PRACTICE IN SOUTH AFRICA

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South Africa is regarded as one of the leading developing countries in terms of contributing to SEA practice. However, no empirical research has been conducted to analyse and highlight experience. This paper provides an overview of the status and characteristics of SEA practice in South Africa in terms of tiers, types and geographic scales. The findings are based on the first extensive SEA survey for the country conducted during 2003. It confirmed that SEA practice is well established and increasing. Moreover the extent of practice compares well with, and the variety in terms of tiers types and scales even exceed that of, most international SEA systems. The research showed that apart from the traditional application of SEA at different tiers of decision making, it was also uniquely implemented as a substitute where strategic level decision making processes were weak or absent. The case studies reflected 'comprehensive' and a variety of 'sectoral' SEA types implemented at national, provincial, sub-regional and local geographic scales. The paper shows that South African SEA practice is vibrant and at the cutting edge of international SEA thinking and could provide solutions to the challenges of tailoring SEA for developing country contexts.

Key words: *strategic environmental assessment (SEA) practice in South Africa, SEA in developing country contexts, tiering, SEA types, geographic scales of SEA*

MITIGATION: PAPER PROMISES OR ACTUAL PRACTICE?

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Whilst mitigation of negative impacts is accepted as being one of the main aims of the environmental impact assessment process, ameliorating measures must be implemented if environmental impacts are to be effectively addressed. The English planning system can facilitate the implementation of mitigation measures identified in an Environmental Impact Statement (EIS) through planning conditions and obligations. This study analyses details of 40 planning applications in the East of England to investigate the practice of translating paper recommendations in the EIS into legal conditions and obligations. A high proportion of mitigation measures suggested in EISs were not translated into planning conditions or obligations. On the other hand, a significant number of conditions or obligations were imposed on developers which had no basis in the EIS. Guidance on

mitigation and planning had not significantly affected the process. The proportion of mitigation measures translated into conditions or obligations varied between development types, and was also affected by the environmental aspect studied. Several recommendations are made to improve the coverage of mitigation measures, including the use of environmental management plans.

Key words: *mitigation, conditions, planning obligations, effectiveness of mitigation, EIA*

ON THE SUCCESSFUL IMPLEMENTATION OF MITIGATION MEASURES: LESSONS FROM A CASE STUDY

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The discussion about the effectiveness of environmental impact assessment has shifted from the accuracy of impact prediction to our ability to effectively prevent significant environmental degradation and to fully implement cost-effective mitigation and other management measures. The actual impacts of the construction phase of a highway project in São Paulo State, Brazil, are reviewed by analyzing monitoring data. A detailed follow-up scheme and a tight internal control are the main reasons for the successful implementation of mitigation and other management measures required by the terms and conditions imposed on the project. A number of lessons learned may evolve into recommendations for similar projects: (i) a management system is a powerful tool to successfully carry on the implementation of mitigation and other management measures; (ii) checklists and audit protocols can be a practical solution to "translate" the terms and conditions of the environmental license, often stated in vague and inaccurate language, into enforceable, manageable and verifiable rules; (iii) external control is essential to guarantee the successful implementation of mitigation measures.

Key words: *effectiveness, environmental impact assessment, follow-up, highways, impact audit*

DEMONSTRATING THE ADDED VALUE OF A STRATEGIC APPROACH TO ENVIRONMENTAL AND SUSTAINABILITY ASSESSMENT

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This paper discusses the practical application of SEA and SA approaches to a range of planning situations and aims to demonstrate where taking a strategic approach will bring added value to the planning and development process.

An array of strategic planning documents are produced at different levels of planning and decision-making and at present, there tends to be a lack of application of environmental assessment until the point at which it becomes a requirement in the planning system. This results in situations where decisions on location, design, technologies and scale have already been made, opportunities for enhancement or innovative planning and design have been missed, delays in the detailed design occur as environmental or socio-economic constraints have not been identified during the early stages of the development planning, and any mitigation measures proposed tend to focus on reduction rather than avoidance of the impact.

This paper is written from the viewpoint of a consultant practitioner. It attempts to address some of the challenges in ensuring the delivery of what the planner or policy maker needs, whilst complying with legislation and conforming with best practice. It discusses how the application of an appropriate level of assessment, at the right stage in the planning process can bring real added value, bringing efficiency savings through streamlining the planning process and helping to deliver a more sustainable plan or programme.

The discussion is supported by specific case examples with particular reference being made to the development of a flexible, comprehensive and rigorous decision support tool, which has been designed to address specific aspects of the SEA process and to overcome some of the challenges associated with the practical application of SEA.

Key words: *SEA, SA, case examples*

TOWARDS INCREASING THE UTILITY OF FOLLOW-UP IN CANADIAN EIA

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The importance of follow-up in the EIA process is clearly recognized in the Canadian Environmental Assessment Act (CEAA) in which, where it is considered appropriate, the responsible authority for a project will design a follow-up program and ensure its implementation. The Act is also explicit in recommending that the results of follow-up programs be used to improve the quality of environmental assessments. The purpose of this paper is to examine whether the specific requirements for follow-up under CEAA in fact provide the best opportunity for such quality improvements.

The definition of follow-up under CEAA requires the verification of the accuracy of the environmental assessment and determination of the effectiveness of measures taken to mitigate the adverse environmental effects of a project. We argue that the Act generally, and the requirements for follow-up specifically, adopts a negative perspective towards project effects by focusing on the mitigation of adverse effects, and also discourages the follow-up of important social or economic effects which are independent of project-related changes to the bio-physical environment. Secondly, we argue that verification of accuracy places an unwarranted emphasis on 'what was expected' rather than on 'what was wanted' in terms of environmental outcomes. Using examples from Canadian experience, we illustrate the limitations of the current approach to follow-up and suggest that greater utility would be achieved by focusing on whether the environmental objectives of the project in question have been achieved.

Key words: *follow-up, Canada*

WILDLIFE ROADKILL IN MAJOR HIGHWAYS IN KOREA

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Construction of a highway influences the fragmentation and deterioration of wildlife habitat. It is inevitable to observe the death of animals that are killed by vehicles. Nonetheless, the cause and status of animal roadkill have not been studied, and this study is the first attempt to analyze the roadkill on a major highway in Korea. We collected 860 individual dead animals in Joongang Highway during 1996-2003. Among them, the Korean hare (*Lepus sinensis*) had the highest figure, with 165 individuals (19.2%) found. Also found was the Korean racoon dog (*Nyctereutes procyonoides*) with 146 (17.0%), the Korean squirrel (*Sciurus vulgaris*) with 56 (6.5%), and the Korean roe deer (*Capreolus capreolus*) with 26 (3.0%). Domestic animals totaled 232 individuals (27.0%); the domestic dog (*Canis familiairis*) was 25 and the domestic cat (*Catus felis*) was 207. We also categorized the habitat on each side of the road as mountain-mountain, mountain-plain, mountain-river, plain-plain, plain-river, and river-river. The mountain-plain habitat had the highest number of dead animals, with 296 (38.9%) individuals, followed by mountain-mountain with 263 (34.6%). This indicates that wild animals associated with the mountain habitat were most influenced by the construction of roads. This study implied that we should mitigate the roadkill by designing artificial constructions such as eco-bridges, fences along the sideway, boxes under the highway, underdrain structures, etc. The monitoring and cause of habitat fragmentation with GIS approach should be followed to reduce the roadkill.

Key words: *wildlife, roadkill, highways, Korean racoon dog, Korea*

CRITERIA FOR EVALUATING THE QUALITY OF HEALTH IMPACT ASSESSMENTS

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Health impact assessment (HIA) has been enthusiastically promoted as an aid to better policy making , but others have questioned its usefulness. Good evaluations of HIA are required to resolve this question but to-date, there have been few, if any, evaluations of HIAs. In July 2003, fifteen participants, representing academics, policy-makers and HIA practitioners, drawn from the UK and Europe, met for three days in Birmingham (UK) to discuss how HIAs might be evaluated. The group concluded that the claims of HIA, as made for example in the Gothenberg Consensus Paper and other guidance, suggest four sets of criteria against which an HIA could be evaluated (1) Information - the extent to which the HIA informed the decision-making. (2) Prediction - the extent to which the predictions of the HIA prove to be correct (3) Participation - the extent to which the HIA made those affected by the decision feel more included. (4) Value-for-money - the extent to which the resources expended reflected the 'value added' of the HIA to the decision-making process. Having estabiuished this framework, the group identified a series of process and outcome indicators for the five stages of HIA: screening, scoping, impact appraisal, dissemination of findings, monitoring and follow-up. This paper will present and reflect upon the discussions held at the Birmingham meeting and the conclusions drawn by participants. The paper will outline the evaluation framework and the suggested indicators, and go on to discuss the next stages of work required to valid this tool. The meeting was sponsored by the U.K. Department of Health.

Key words: *health impact assessment, evaluation, quality assurance indicators*

ENVIRONMENTAL MANAGEMENT AND SKI AREA DESIGN AT SUNSHINE VILLAGE SKI AREA, BANFF, ALBERTA

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Sunshine Village ski area (Sunshine) is a commercial downhill ski area in Banff National Park, Alberta, Canada. Located in a World Heritage Site, environmental stewardship is a fundamental principal in the design, planning and operations of the ski area. This has been achieved through an integrated approach to ski hill design and operation which applies regional and site-specific environmental assessments to developing ski area facilities. The adoption of best management practices to construction, reclamation and monitoring has been developed over sixty years of ski operations at Sunshine. This paper presents examples of changes in technology and innovation in environmental impact assessment, construction and reclamation practices at Sunshine. Such changes have included the use of high resolution satellite imagery, orthophotos, digital elevation models and detailed ecological land classification to provide a series of databases for ski area planning and environmental assessment. Technological advances have proceeded along with a greater understanding of environmental sensitivities in Alpine and Sub-alpine environments. Lift replacement projects (including the recently renovated main access gondola), buildings, and infrastructure upgrades are used to illustrate how ski area design principles have been combined with environmental sensitivities and environmental management systems in the development of the ski area. The holistic approach to design at Sunshine incorporates environmental considerations into the conceptual design of the entire lease area through to individual components and elements of the facilities. Balancing skier and rider expectations with environmental protection has been achieved with extensive regulatory and public input throughout the planning and approval process. Environmental Management Systems have also been developed to optimize water use and re-cycling, as well as energy conservation measures to lower peak power demands and minimize atmospheric emissions.

Key words: *ski area, environmental assessment, environmental management*

EVALUATING THE EFFECTIVENESS OF EIA: LEARNING FROM RESEARCH ON ITS SUBSTANTIVE OUTCOMES

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The philosophical concept of effectiveness has been a central theme of the Environmental Impact Assessment (EIA) research agenda in the decades since this decision tool was first enacted. Yet research has focused principally on procedural aspects of effectiveness, to the obfuscation of substantive outcomes. An analysis of those studies that have examined the outcomes of EIA indicates that its contribution to consent and design decisions is limited, due primarily to passive integration with the decision processes it is intended to inform. The contribution of EIA to sustainable development is largely unknown (and perhaps unknowable), but it is hypothesised that EIA makes a more significant contribution to sustainable development than has typically been assumed. This contribution is achieved through a plethora of causal processes, including the emancipation of stakeholders and incremental change in the bureaucracy, commercial organisations and scientific institutions. It is suggested that, in attempting to enhance the substantive outcomes (and hence effectiveness) of EIA, the research agenda should focus increasingly on advancing theory concerning the nature and operation of a broad range of causal processes. The conceptual, methodological and analytical challenges associated with such research are substantial (Bond, 2003), but this approach offers arguably the greatest potential for accurate assessment of, and substantial improvement in, the effectiveness of EIA.

Key words: *environmental impact assessment, effectiveness, theory, decision-making, sustainable development*

RECENT DEVELOPMENTS FOR EIA IMPLEMENTATIONS IN TURKEY: ESTABLISHING EIA CENTER AND SECRORAL APPROXIMATION STRATEGY

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The Government of Turkey has almost completed the adoption of the EU Directive for EIA as of 15 December 2003, by enacting a revised EIA regulation. The only aspects of the EU Directive that this new legislation lacks are ratifications of the Aarhus and Espoo Conventions. A project funded by Senter (an entity of the Ministry of Foreign Affairs in The Netherlands), entitled "Approximation and implementation of the EIA Directive in Turkey" was conducted in order to aid in the practical implementation of the EU EIA Directive through the drafting of guidelines and handbooks, the execution of two pilot projects on EIA and SEA, and the provision of training in EIA methodologies, among other activities. In order to provide the regular training through EIA stakeholders, new project "Establishing EIA Training and Information Center" will be implemented for two years starting from January 2004. By the help of this project, sectoral guidelines will be prepared for twelve sectors, training strategy will be prepared and intensive EIA Training will be conducted and EIA assessment techniques other than expert level will also be used in EIA Review Committee such as modelling programmes, using GIS if required, using matrices and overlapping maps. Turkey also increased her effort for the studies of adoption of environmental acquis which focuses on horizontal sector, water management, waste management, and industrial process control. EIA is the main component of the Horizontal sector. First of all, Directive Specific Implementation Plan (DSIP) for EIA, for SEA and for Access to Information about environmental issues has been prepared, and after combining those DSIPs,, Sectoral Approximation Strategy has been prepared focusing on training, institutional capacity, financial mechanisms and timeframe of the activities for a 25- year period. This EU-funded project is also important as being the first sectoral approximation strategy.

Key words: *EIA training center, sectoral approximation strategy, sectoral guidelines, DSIP*

EIA IN THE TOURISM SECTOR IN EGYPT

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In February 1994, the Government of Egypt had issued law No.4/94 concerning protection of the environment. The objective of the law was not only addressing pollution measures and control, but also involved new developments and projects including expansions of the existing ones. New establishments are required to carry out an Environmental Impact Assessment (EIA) before construction. Relevant articles in the Executive Regulations, issued by the Prime Ministers decree No.338 of 1995, complement the law. The Egyptian Environmental Affairs Agency (EEAA) is mandated to implement law 4/94 and is responsible for the review and decision making for EIA in Egypt. During the past years, the EIA system had witnessed several developments and improvement not only within the EEAA but also the Competent Administrative Authority or the licensing authority.

In 1994 only 5 EIS had been submitted for review to the EEAA. The numbers had increased drastically in the following years. In the past five years, an average of 350 full fledged EIAs had been submitted to EEAA in the tourism sector alone that represents approximately 35% of the studies submitted to agency.

This paper presents the Egyptian efforts to handle EIA in the tourism sector, including the capacity building in the Tourist Development Authority (TDA) being the competent administrative responsible for the tourist development in Egypt. The paper shall present the history of building up the capacity of the TDA in environmental issues and give a brief analysis of the current situation and what can be done next in order to develop the tourism sector in Egypt sustainably.

Key words: *EIA, tourism sector, Egypt*

GENERATION RATE OF CONSTRUCTION & DEMOLITION DEBRIS DUE TO CONSTRUCTION ACTIVITIES

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To estimate the amount of debris generated during construction activities, basic generation rates on each construction type should be required. Generally there are two ways to get these rates. One is so called a direct method: Based on the actual measurement at the construction site; The other is an indirect method: Using additional material rates in the estimating data of the plan. In a direct method, accurate data could be obtained, but this method costs lots of time and expenses, and the results couldn't be easily generalized in other sites. Therefore, using this method is not considered to be efficient. However, it is relatively easy to obtain the generation rates of debris in an indirect method. Additional material rates mean the supplementary portion of construction material which was reflected in the estimation of material usage, but might be discarded during construction process due to various reasons. During the construction process, accurate amount of material should be needed for a specific process based on the construction plans, and additional amount of material should also be reflected. This additional portion has a high possibility to be discarded during the process, and that amount could be regarded as C&D debris. In addition, the amount of material inputted during building construction is considered to be discharged during demolition process. The amount of C&D debris could be obtained by simply using this concept in EIA. Although various data could be used in determining the amount of C&D debris, not only the amount but also the types of C&D debris discharged should be dealt with importantly when considering the proper treatment of C&D debris. In conclusion, since both methods have both merits and demerits, proper generation rate should be used by considering the each condition of construction activity.

Key words: *C&D debris, generation rate, construction activities, additional material rate*

HEALTHCOUNTS: RELEVANT MEASURES OF DETERMINANTS OF HEALTH - CHOICES MADE BY COMMUNITY AND PROFESSIONAL GROUPS IN A UK SETTING

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The importance of action upon the broader determinants of health and well-being, for health improvement and reductions in health inequalities, is now widely recognised. In the UK and elsewhere, Health Impact Assessment (HIA) has been identified as one methodology by which this action can be facilitated. There is a consequent need to identify appropriate measures that profile determinants, both to monitor policy impacts and for use in methodologies such as

HIA. At present it is unclear which measures are best used to monitor and assess influences on health. The HealthCounts project has explored people's concepts of (a) health, illness and well-being and (b) the important determinants of health, illness and well-being. Using these conceptions, HealthCounts has enabled participants to assess those measures that are routinely available in the UK that relate to factors that influence health, illness and well-being. In order to explore the issues outlined above consultation exercises were conducted with a range of community groups and professionals in the Shropshire and Black Country areas of the UK. This was done through the use of focus groups and key informant interviews. During the process participants were asked to assess measures and indicators that relate to their conceptions of health determinants. The measures used were from an inventory of UK based routine datasets compiled especially for the project. HealthCounts was able to explore commonalities and disparities in the concepts of health and influences on health expressed by community members and professionals, and in the choices made concerning appropriate measures and indicators. The findings from the project will be of direct relevance to stakeholders choosing measures and indicators that relate to determinants of health.

Key words: *determinants of health, measures, indicators, health impact assessment*

ENVIRONMENTAL AND RISK ASSESSMENT FOR THE EXPANSION OF EURALLUMINA RED MUD BASIN IN SARDINIA (ITALY)

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Eurallumina is the largest plant in Italy for the production of alumina from bauxite. The plant is located in the industrial area of the Portoscuso Village, in the south west of Sardinia. In this area several plants for the production of different metals (aluminum, lead, zinc) and associated facilities (power plants, conveyor belts, harbor, storage areas, etc.) were constructed commencing in the '60s. The area has been included by the national government in the list of "Sites of National Interest" for the severity of historical contamination of soil, groundwater, and air due to the high concentration of industrial facilities. Adjacent to the contaminated area there is a coastal wetland that hosts a number of endangered species and has been included in the list of "Sites of Community Interest" according to the EU Habitat Directive. Eurallumina owns and manages an evaporating pond for the storage of the red muds resulting from the production of alumina from bauxite using the Bayer technology, based on wet processing of bauxite at very high pH. Initially red muds were stored in an unconfined, unlined area and then in an engineered basin that has been in activity since 1974. The existing basin is being filled and Eurallumina requires additional volume for the disposal of red mud for a future period of at least 15 years. Chosen was lateral expansion in an area that was previously used for the disposal of materials dredged from the industrial harbor, and therefore is contaminated, and is located adjacent to the protected wetland. Golder Associates and ART Studio performed a number of baseline studies including soil and groundwater contamination investigation and modelling and the dust modeling. These studies have been coordinated into a formal Environmental Impact Studies.

Key words: *contamination of soil, groundwater, and air, red mud basin, coastal wetlands*

MOVING THE EMP FROM THE SHELF TO THE FIELD IN SHELL PETROLEUM DEVELOPMENT COMPANY, NIGERIA

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In less than a decade, Environmental Impact Assessment (EIA) has become established in Nigeria and has rapidly stimulated growth in public awareness as regards environmental issues. However, the success or failure of any EIA depends on the effective implementation of the Environmental Management Plan (EMP). The EMP is a strategic tool that specifies guidelines and procedures for managing the significant adverse impacts of a proposed project when the proposed activity is actually executed.

In the period 1997 - 2002, thirty projects in Shell Petroleum Development Company's Eastern Division (SPDC-E) obtained regulatory approvals for their EIAs with EMP implementation as a requirement. Only three of these projects have records of EMP implementation that commenced late in the construction phase. The factors hindering effective EMP implementation in SPDC-E include a lack of commitment by project managers, poor understanding of the EMP by the project HSE focal point,

poor EMP content, weak internal and external monitoring of EMP, and no financial commitment for EMP implementation.

This poor record indicates that there is a gap between the theory and the practical implementation of the EMP. This shortcoming has been identified and the new SPDC EIA process manual has put in place measures to address it. The manual requires that the EMP be extracted from the EIA as a stand alone-document and endorsed by respective project managers indicating acceptance.

This paper gives details of the measures taken by SPDC to ensure that EMP implementation becomes a key aspect of every project, the challenges faced and areas for improvement. Also, the paper presents a case study of the EMP implementation for the Cawthorne Channel Associated Gas Gathering project.

Key words: *environmental impact assessment, environmental management plan, implementation, Shell Petroleum Development Company, associated gas gathering*

EIA AS AN INTEGRAL TOOL OF AN ECOSYSTEMS APPROACH TO URBAN DEVELOPMENT

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Urban development in developing countries is to a significant extent characterized by an uncontrolled influx of poor peasants from rural areas to slum areas in major cities, seeking work in industries and urban businesses. Most of these slums are breeding grounds for diseases, crime and sustained poverty. Systemic environmental problems ranging from poor health due to lack of access to clean water supply and sanitation, to vehicular related local air pollution and climate change can be traced to patterns of industrial activities and growth of cities. Towns and cities will increasingly be the locations where human activities and their associated ecological impacts can be best met with policy and planning responses (UNU/IAS). To reduce these pressures on municipalities and governments there is an urgent need to enhance practical and decentralized urban environmental management policies and strategies, and to improve assessments through capacity building, partnership development, demonstration projects, and knowledge sharing.

This paper focuses on the use of EIA and SEA as integral development tools for an ecosystem approach to urban development. The ecosystem approach is defined as a comprehensive and holistic approach to anticipated environmental change, and aims to assess and mitigate the full range of impacts of urban development, and to mainstream environmental issues in local development policies and to address linkages between poverty and environment. An ecosystem approach recognizes the interconnections among component parts, and also recognizes that humans are an integral part of this and that human social and economic systems constantly interact with other physical and biological parts of the system. Upstream and early application of adaptive environmental impacts assessments procedures in urban planning is key to sound and sustainable development.

Key words: *ecosystems approach, urban ecosystems, urban development, capacity building, strategic environmental assessment, developing countries*

THE ROLE OF PROJECT INSPECTION IN THE IMPACT ASSESSMENT FOLLOW-UP AND MONITORING PROCESS. A CASE STUDY OF THE WORLD BANK INSPECTION PANEL AND THE CHAD CAMEROON OILFIELD AND PIPELINE PROJECT

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The World Bank Inspection Panel was created in 1993 to ensure compliance of World Bank projects with the Bank's social and environmental safeguard policies and to provide private citizens an independent forum to determine whether they or their interests have been harmed by projects financed by the World Bank. The Panel is the first body of its kind to give affected individuals a voice in how and if international development projects proceed and in turn has established a process for accountability at the World Bank.

The paper will discuss the role of project inspection and contrast it with other IA follow-up procedures such as compliance monitoring, auditing and evaluation of project environmental assessment documentation. This will be evaluated within the context of the recent Panel inspection of the Chad Cameroon Oilfield and Pipeline Development project. Both social and environmental aspects will be considered.

Challenges in the inspection process will be examined such as eligibility of requests, time and budgetary constraints in the investigation process, relationship with other follow-up procedures and the implementation of panel findings. The authors conclude that inspection is a useful tool in the toolbox of IA follow-up techniques but has a very different application and purpose than other compliance mechanisms.

Key words: *impact assessment, follow-up, compliance monitoring, inspection*

EVALUATION DE LA QUALITE DU RESEAU HYDROGRAPHIQUE DE LA REGION DE MEKNES (MAROC)

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Le déversement des déchets liquides dans la nature, en particulier dans le réseau hydrographique a des impacts négatifs sur la santé et l'environnement, cela se manifeste par une détérioration de la qualité biologique, physico-chimique et bactériologique des cours d'eaux récepteurs et la circulation des maladies hydriques. Meknès est une grande ville renferme une activité industriel, agricole et d'élevage intense. Les déchets liquides issues des activités sus-cités sont drainés par le réseau d'assainissement liquides, et rejetés directement sans traitement préalable dans le réseau hydrographique. Meknès une ville non cotiere. Les oueds qui traversent cette ville sont de faible débit parfois nul en période d'étiage.l'utilisation des eaux pour l'irrigation, entraîne une réduction du pouvoir autoépuratoire des oueds. L'apport des rejets à l'intérieur de la ville provoque une altération des caractères physico-chimiques, organoleptiques et biologiques de ces eaux. Malheureusement ces eaux sont utilisées pour l'irrigation des cultures arborescentes et maraîchères Notre étude aura pour objectif de donner une aperçu sur les principaux rejets polluants industriels qui gagnent le réseau hydrographique de la région de Meknès (Produits phytosanitaires, métaux lourdes, poly phénols,...) en augmentant le nombre de point de prélèvement et le nombre d'analyses dans la région (puits, sources, oueds, barrages....) et dans un deuxième temps de rechercher des bio-indicateurs (macro-invertébrés, bactéries, levures, hydrovirus ...) pouvant nous renseignés sur la qualité de ces eaux, ces deux axes de recherche se débouchant sur la recherche des micro-polluants (métaux lourds, poly phénols,.....).

Key words: *impact environnemental, dbo, dco, poly phénols, métaux lourdes, hydro virus, maladies pa*

PARTNERING TO SUCCESS: ACHIEVING OPTIMISATION THROUGH APPROPRIATENESS

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Sustainable development is about recognising the finality of the resources we have and targeting them for the most effective use. This means getting the best value out of what you put in - the primary aim of every organisation, especially business. Deciding what goes into an integrated environmental and social impact assessment (ESIA) is a challenge, deciding how to use the outcomes and recommendations are, in many cases, even more challenging. Having established the potential impact, the consequent significance has to be determined. In turn this significance can inform decision-makers of the most appropriate action that can be taken. Developing an 'appropriateness assessment' is the only way forward for optimising performance on a project. Decisions have to be made based on a clear understanding of the changing sensitivities and expectations associated to a project site. Many companies, including BP, have previously shot themselves in the foot by raising expectations due to the rhetoric they use, but then being unable to meet them. This leads to disappointment and tarnished reputation, irrespective of whether the project did in fact outperform its peers from a social and environmental perspective. The subjectivity of varying sensitivities and expectations requires both input and influence of major stakeholders across the three sectors of non-governmental, Government and business. This should be beyond the 'what' of what goes into an ESIA, but extend also to sharing the risks and accountabilities of 'how' an ESIA is used. The world summit in Johannesburg last year has given increased legitimacy and a resource base to cross sector partnerships. The ESIA process should be welcoming this as a positive step forward to better understanding, managing and responding to social and environmental sensitivities and stakeholder expectations, and thus making the best use of the finite resources it has as its disposal.

Key words: *sensitivity, expectations, appropriate, cross-sector partnerships*

APPLICATION OF RISK ASSESSMENT PRINCIPLES TO THE ASSESSMENT OF IMPACTS ON FISH HEALTH FROM OIL SANDS DEVELOPMENT: HOW SAFE IS SAFE ENOUGH?

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The standard approach used for assessing risks to fish health in the oil sands region of northeastern Alberta is adopted from the well-known and accepted risk assessment framework. This approach requires that answers be provided to the following three questions: (1) How safe is it? (2) How sure are we? and (3) Is that acceptable? Answering the first question requires a rigorous, step-by-step process that includes screening of chemicals of concern, selection of appropriate fish species to act as indicators, examining not only the magnitude, but also the frequency, duration and extent of exposure, and then assembling a weight of evidence from models, toxicity tests and field-based investigations. Answering the second question requires a

transparent approach to addressing the three primary sources of uncertainty: natural variability, ignorance and measurement error. Addressing uncertainty can include the use of deliberately conservative assumptions to ensure that risks are not underestimated. Probabilistic exposure estimates are excellent tools that help account for natural variability. It is essential that the assessment address uncertainty in a manner that facilitates decision-making; this requires clear and concise information targetted at the "but what if we are wrong" question. Answering the third question requires input from the public and regulators. Obtaining information on the definitions of acceptable risk prior to conducting the assessment will help ensure that the results of the risk assessment are placed in the appropriate context. An illustrative example from a recent oil sands EIA will be presented.

Key words: *risk, fish, health, oil sand, screening, chemicals, indicators, magnitude, frequency, duration, extent, exposure*

CONSTRAINTS MAPPING AT A SAGD FACILITY IN THE OIL SANDS REGION OF NORTHERN ALBERTA

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OPTI Canada Inc./Nexen Canada Ltd. (OPTI/Nexen) developed a constraints map for their proposed Steam Assisted Gravity Drainage (SAGD) project near Anzac, Alberta. Constraints mapping is a graphical representation of the suitability of a land area for construction purposes. The objective of a constraints map is to provide information that will allow reduction of a project's footprint in areas of higher constraint to trigger elevated levels of site mitigation and avoid "no-go" areas. OPTI/Nexen used the constraints map as a key planning tool during the conceptual and detailed design phase for their project to balance the placement of surface facilities with environmental and cultural land use sensitivities. A constraints map is a dynamic tool that can be used over the lifetime of a project, from initial screening at the beginning to detailed facility siting for future phase updates. Constraints maps take into consideration regulatory requirements; raw data such as disturbances, wetlands, field survey data, traditional use, historical sites, soils and air photos as well as derived data such as wildlife Habitat Suitability Index modelling results. They may also include subsurface environmental, surficial and subsurface engineering and temporal constraints. Fundamentally, constraints mapping utilizes the same information as the Environmental Assessment process, however it processes the information in a slightly different manner.

Key words: *steam assisted gravity drainage, SAGD, constraints, map, suitability, graphical, sensitivities, environmental, cultural, temporal, engineering, mapping*

AN APPLICATION OF THE HYDROLOGIC SIMULATION PROGRAM FORTRAN (HSPF) MODEL TO TWO LARGE SCALE ENVIRONMENTAL IMPACT ASSESSMENTS IN NORTHEASTERN ALBERTA, CANADA

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Oil sands mining development in northeastern Alberta results in changes in local watersheds including changes in water balance, waterbody surface elevations and discharges, basin sediment yields, stream geomorphology and drainage patterns. These changes are significant to those interested in assessing project effects on the hydrologic resources of the region as well as those whose concern lies with maintaining water quality and aquatic ecosystems.

The Hydrological Simulation Program FORTRAN (HSPF) model, which was developed by the US EPA, is a state-of-the-art tool for predicting continuous hydrologic and water quality data series based on historical climate data, surficial geology and human activity in a particular watershed. The model is flexible in its data management features and can be applied to a wide range of dynamic water quantity and quality problems. Hydrologic issues of interest to regulators, operators and stakeholders are the effects of regime change on water quality, fish habitat and river geomorphology.

In the assessment of the Canadian Natural Horizon and Shell Jackpine Mine - Phase 1 Oil Sands Projects, Golder Associates used the HSPF model to assess the hydrologic responses of surface waterbodies to the proposed physical changes to local watersheds. This paper discusses the calibration of the model for northeastern Alberta and the results obtained from its application to a large environmental impact assessment. The benefits of using HSPF over previous assessment methods will also be discussed.

Key words: *Oil Sands, watershed, water balance, water, basin sediment yield, Hydrologic Simulation Program Fortran, HSPF, water quality, model*

A DISCUSSION ON THE COMPLETION OF CUMULATIVE EFFECTS ASSESSMENTS (CEAS) IN THE OIL SANDS REGION

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Cumulative Effects Assessments (CEA) are an integral component of Environmental Impact Assessments (EIA) completed by Golder Associates Ltd (Golder) together with its oil sands clients—Suncor, Canadian Natural, Shell and others. The approach has been to prepare an integrated EIA that includes a defensible, comprehensive CEA for the application of each project, while meeting both federal (e.g., Canadian Environmental Assessment Act—CEAA) and provincial assessment requirements.

The EIAs include a Planned Development Case assessment, which considers existing and approved projects, the project being assessed as well as other developments planned for the future. Although most planned developments have not yet been subject to formal approval applications, they are included because if they were to proceed, they could result in additional environmental impacts in the development area. The CEAA states that the planned developments should be "reasonably foreseeable projects and activities." Including speculative projects beyond this regulatory requirement renders assessments less accurate and therefore less useful for the regulators, the proponent and other stakeholders. To limit inclusion of speculative projects, most oil sands EIA's include only those projects that have been publicly disclosed six months prior to EIA submission. While this does not eliminate projects that will never be operated, public disclosure does suggest a certain level of commitment to project construction.

Even though all planned development projects have been publicly disclosed, there are often limitations on the level of detailed information available to include in the assessment. This uncertainty is reduced by using conservative assumptions based on information from existing operations. In subsequent EIAs, some of the planned developments become approved and existing developments, with increased accuracy of data to reduce conservatism.

Key words: *cumulative effects assessments (CEAS), Oil Sands, planned developments, conservative assumptions*

AN APPLICATION OF THE HYDROLOGIC SIMULATION PROGRAM FORTRAN (HSPF) MODEL TO TWO WATER QUALITY ASSESSMENTS IN LARGE SCALE ENVIRONMENTAL IMPACT ASSESSMENTS IN NORTHEASTERN ALBERTA, CANADA

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Oil sands mining development in northeastern Alberta result in changes in local watersheds including changes in water balance, water level and discharges, basin sediment yields, stream channel erosion, drainage patterns, water conveyance and storage facilities. These changes may alter water quality and thermal regimes of surface waterbodies.

Prior to 2001, assessments of water quality impacts of oil sands developments on small streams in northeastern Alberta have been based on a simple, steady-state mixing model. The steady-state model typically utilizes 7Q10 low flow, mean open water flow and observed maximum concentrations of mine release water to predict water quality impacts under median background substance concentrations during winter and open-water conditions. Drawbacks to this approach are that the simple mixing model does not provide a complete representation of the stream water fluctuations, and typically produces highly conservative results. Thus, potential oil sands developments in northeastern Alberta could otherwise be constrained by conservative predictions of water quality impacts based on the simple, steady-state model. Therefore, the recent increase in the number of existing, approved, and planned oil sands development projects call for more sophisticated and realistic dynamic models, such as the Hydrological Simulation Program FORTRAN (HSPF).

The HSPF model is a state-of-the-art tool for predicting continuous hydrologic and water quality data series based on historic climatic information, surficial geology and human activity in a particular watershed. After having completed a comprehensive calibration of the HSPF model in the Athabasca oil sands region of Alberta, Golder Associates has recently applied the model to two large scale oil sands

developments' environmental impact assessments (EIA). This paper will discuss the results obtained from simulations used to predict water quality as a result of the Canadian Natural Horizon and Shell Jackpine Mine - Phase 1 Projects.
Key words: *Oil Sands, watershed, water balance, water, basin sediment yield, thermal regimes, Hydrologic Simulation Program Fortran, HSPF, water quality, dynamic*

EA FOLLOW-UP IN GHANA (AFRICA)

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EA follow-up is an essential component of the environmental assessment process. The EA follow-up process generally entails monitoring, evaluating and managing of actual project impacts on the environment. By acting as a feedback mechanism, the EA follow-up process provides a means for transferring lessons learned from field experiences into the EA practice. In spite of its obvious importance, research in Africa and in Ghana suggests that EA follow-up is an option rather than a rule in the EA process. Why? There are several difficulties facing the entire EA process; particularly in the area of local involvement, local capacity and baseline information. As a result, most EAs undertaken in Africa concentrate on the impact predicting stages of the EA process, with minimal consideration for project follow-up and impact evaluation. This paper examines EA follow-up options for Ghana and provides a framework and recommendations for effectively undertaking EA follow-up. Based on three EA challenge areas–local involvement, local capacity and baseline information–the paper suggests a medium for translating these challenge areas into avenues to facilitate the EA follow-up process in Ghana. The paper employs EA follow-up programs and case studies from different jurisdictions including Canada, Africa, Asia and Australia. In summary, this paper promotes the idea that there are opportunities within the EA challenges, which could be harnessed to further improve the effectiveness of the EA process in Ghana and Africa as a whole.

Key words: *EA follow-up, local involvement, local capacity, baseline information*

SOCIAL IMPACT ASSESSMENT AND OFFSHORE OIL AND GAS IN THE GULF OF MEXICO REGION

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On February 3-5, 2004, the Minerals Management Service held a socioeconomic workshop for the Gulf of Mexico Region. We addressed social impact assessment topics in this region including fiscal, industry, and cultural effects. Our paper will present some of our new research directions and ideas that resulted from breakout session discussions. More specifically, this session will address the theoretical and methodological challenges faced when using the classic SIA paradigm in the Gulf of Mexico Region. With approximately 4,000 producing platforms contributing to 30% of the nation's oil supply, this region illustrates the challenges of SIA research due to its complexity, magnitude, and longevity. We use fiscal/infrastructural and cultural variables to illustrate our challenges such as identifying the affected area, the nature of effects, and the difficulty of establishing the baseline and cumulative effects. These variables crosscut all industry sectors and communities. Fiscal and infrastructure effects of the industry include resources such as tourism, recreation, schools, transportation, social services, and public revenues. Since past SIA research in the Gulf has focused primarily on rural areas, we will examine urban communities affected by the oil and gas industry. Our study of culture is meant to: 1) identify the affected populations and cultures in the Gulf of Mexico Region; 2) develop methods for assessing cumulative impacts on these groups; 3) investigate the relationship between industry sector demands and impacts on uniform features of culture; and 4) uncover current environmental justice concerns for the region. Although our research addresses challenges specific to the oil and gas industry in the Gulf of Mexico region, the findings also have implications for social impact assessment in other complex contexts.

Key words: *SIA, oil industry, Gulf of Mexico, culture, infrastructure*

GULF OF MEXICO CHALLENGES

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Offshore oil and gas activity began in the Gulf of Mexico in the 1940s. Rather than a sudden, radical event, offshore oil and gas development continued the evolution of the oil and gas industry from solid land into marshes, swamps, lakes, and finally the open waters of the Gulf. Since that time, the march has continued into deeper water and to distances farther from shore. Onshore, supply bases, fabrication yards,

and ports have been constructed or modified to meet the needs of inland, inshore, and offshore fields. The ongoing evolution of the industry has meant that the effects of offshore oil and gas activity have changed over time. For example, larger platforms require larger workboats; larger workboats require operators with specialized skills and licenses; longer distances mean concentrated work schedules. As a result of both complexity and longevity, the impacts of the offshore oil and gas industry in the Gulf of Mexico cannot be effectively captured with standard SIA methods and frameworks. This paper describes the challenges and the evolution of a new approach to SIA in the MMS Gulf of Mexico Region.

Key words: *SIA, cumulative, challenges*

EIA FOLLOW UP PROCEDURES IN TURKEY: CURRENT SITUATION AND FUTURE OUTLOOK

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EIA regulation has been implemented in Turkey since 1993. After becoming a candidate country for the European Union, Turkey has increased her effort through approximation studies, including the EIA implementations. Turkey is a centralised country for public administration and most of the EIA process has been controlled and implemented by the Ministry of Environment and Forest, The General Directorate of EIA and Planning. In order to implement the EIA Regulation in the same sense, there is a need to have sectoral guidelines for main sectors. In order to provide for arranging regular training programs and for preparing remaining EIA guidelines, the Ministry of Environment has decided to establish EIA Training and Information Centre in January 2004. EIA follow-up process is a separate department and annually selected EIA projects in 81 province are inspected by the experts. Before going to the project site, the EIA Report has been assessed by the inspector considering the specific properties of the project, process used, air pollution, emissions, other related environmental permits, waste, noise, water usage and water pollution, reclamation process if applicable, etc. and it is controlled on site. Although general guidelines exist that are used for this purpose, sector-specific guidelines are needed and sector-specific training should be conducted. This paper indicates current EIA Process and current environmental follow-up procedures vs. current EIA follow up procedures in Turkey and the challenges for better implementing of EIA Follow-up process.

Key words: *EIA follow-up process, EIA process, inspector, sectoral guidelines, follow-up procedures*

IMPLEMENTING SUSTAINABLE DEVELOPMENT USING THE PUBLICLY ACCOUNTABLE DEVELOPMENT MODEL

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Few people today would argue that sustainable development is, in theory, a noble cause. However, despite its broad acceptance, there are problems with its practical application and implementation. Notwithstanding the stories of success, in many industries there is still a gap between the philosophies of sustainable development and their execution. This paper presents a model for implementing the principles of sustainable development in an organizational setting.

Accountable Development (AD) is a strategy-based model for the implementation of sustainable development. Drawing on business, social and environmental inputs, organizations can custom tune the model's parameters to develop advantages in achieving the organization's goals; whether the goals are financial, customer, shareholder or market position focused.

Starting with an organization's values, AD integrates the key principles of sustainable development, the driving forces of business or government, the use of appropriate environmental tools, corporate social responsibility and industry recommended practices, to provide verifiable reporting indicators. Using customized input criteria, the AD model is flexible enough to allow decision makers to evaluate environmental choices in the context of the organization's needs, and produces a reporting matrix that reflect the values of the organization.

As an organization-specific method, AD can be easily adopted for implementation by various types of organizations to realize operational goals and higher-level institutional strategy.

Key words: *sustainable development, business strategy, accountable development, environmental management, reporting*

INFLUENCE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS OF INFRASTRUCTURE PROJECTS IN THE CONSERVATION AND STUDY OF CULTURAL AND HISTORICAL HERITAGE IN SPAIN FROM 1990 TO 2003

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Prevention of negative environmental impacts has been integrated in design and construction of linear infrastructures in Spain since 1988, the year that the national EIA Law (R.D.L. 1302/86) took effect. Cultural and historical heritage protection were mentioned in the Article 2 of the Law.

Historical and archaeological heritage are the principal witness of the historical evolution and the identity of a society and its contribution to universal civilization. The set of goods, elements and costumes characteristic of a society are included in this concept.

In a great proportion, the Environmental Impact Studies of lineal infrastructure projects in Spain since 1990 have considered necessary some type of control or archaeological intervention during the project and, later, during the works. For this reason, it follows that it is of big interest to evaluate the impact of this EIA process over the study and the recuperation of the historical and the archaeological heritage.

The experience of the last fifteen years constitutes a good perspective to analyse the results. This paper highlights the results of a research about the effectiveness of EIA process in protecting and studying the archaeological heritage in Spain

Key words: *cultural, historical heritage impacts assessment, projects, infrastructure*

FAST-TRACK ENVIRONMENTAL ASSESSMENT AND PERMITTING IN THE ROCKY MOUNTAIN WEST, USA

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Fast-track environmental assessment and permitting in the Rocky Mountain West has come under more focus of late due to the increased oil and gas exploration and production activities occurring throughout the region. Operators compete for valuable regulatory agency time and attention, project proponents want to move more quickly and information overload can bog down even the most carefully planned approval cycles. The need to meet NEPA requirements, involve the public, and gain important field and laboratory data for site-specific analysis often puts tremendous pressure upon fast moving projects. This paper explores some recent lessons learned regarding fast-track environmental assessment and permitting, and provides insight into some of the most recent methods for achieving high environmental integrity for rapidly evolving projects, such as rapid ecological assessment, web-based environmental management systems, remote sensing, and advanced multi-track project planning. A recent program to advance tertiary recovery of oil using CO2 injection at the Salt Creek Field, Wyoming is discussed in some detail as it involved Bureau of Land Management assessment and approval.

Key words: *EIA, EA, fast-track, impact assessment, permitting, Wyoming, CO2, USA, NEPA*

EMERGING ISSUES IN ENVIRONMENTAL ASSESSMENT OF WIND ENERGY FACILITIES

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As wind projects are being developed in an increasing number of jurisdictions, with widely varying settings and often in closer proximity to residential and urban areas, permitting agencies must address new land use and environmental issues. Among the issues that are taking on increased significance are the following:

- Property Set-backs. Some land use agencies require that turbines be set back from property boundaries with the stated purposes of safety and the protection of down-wind landowners' "wind rights."

What types of set-backs are being specified around the country and what are the underlying land use and legal principles behind these decisions?

- Cumulative Effects Analysis. The United States' National Environmental Policy Act (NEPA) and some state-level environmental review statutes require that the cumulative effects of proposed and reasonably foreseeable actions be evaluated for their effects on natural and human resources. Recently, some stakeholders have advocated that environmental review of wind projects address the cumulative effect of development on regions, states, or the nation. What are appropriate ways to address cumulative effects of wind projects?
- Noise: In the past, noise has primarily been an issue in rural residential areas where houses are sited nearby. In a few jurisdictions, such as the states of Oregon and California, compliance with ambient noise standards has proven very difficult, prompting efforts to review and revise noise regulations as they pertain to wind projects. This presentation will review the status of emerging issues in wind project permitting and identify tools and precedents that can help guide the assessment of wind energy projects.

Key words: *wind energy, cumulative impacts, noise, land use*

A NEW APPROACH TO INDIGENOUS PARTICIPATION IN THE ENVIRONMENTAL ASSESSMENT OF A MAJOR HYDRO-DEVELOPMENT: THE CASE OF THE EM-1-A AND RUPERT RIVER DIVERSION

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The Cree First Nation of Eeyou Istchee (eastern James Bay) entered into a set of agreements in 2002 regarding a new major hydro-electric development project. One of these agreements involves a direct participation of the Cree communities in the studies leading to the preparation of the EIS that the proponents (Hydro-Québec and James Bay Energy Corporation) must submit to the review process. Another agreement, this one with the provincial and federal governments provides a new framework for the harmonization of environmental review processes, a first in almost 30 years of hydro-electric development in northern Québec. Although familiar with joint environmental review procedures since 1978 through their direct participation on the permanent environmental boards, the Crees had never before devoted such a level of effort with a proponent to develop the capacities at the community level to partake in the environmental studies, upstream from the review process. They are also actively pursuing means of disseminating the information gathered from these studies. Two years into the implementation of these agreements, our research is looking at the role of the communication and discussion activities surrounding field studies in connection with the project; the extent to which these activities are community-based; the nature of the contribution of the communities to the social and environmental impact assessment. Based on empirical data gathered through individual interviews and focus group discussions in four Cree communities during Fall 2003 and Winter 2004 we will evaluate how efficient this new approach has been so far.

Key words: *Cree First Nation, hydro-development, environmental review, public involvement*

SECTORAL ENVIRONMENTAL ASSESSMENT IN MEXICO: A METHODOLOGICAL APPROACH

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Strategic Environmental Assessment (SEA) has been presented in several countries since 1992 as a tool for policy, planning and overall programme analysis. One of its main forms is the Sectoral Environmental Assessment which includes the evaluation of sector investment programmes involving multiple sub-projects; integration of environmental concerns into long-term development; and investment planning or the evaluation of sector policies (World Bank).

Mexican Environmental Law and Environmental Impact Assessment Regulations do not contemplate specifically SEA. However, certain strategies and programmes such as urban development plans or ecological ordinances of the country's territory should prepare a Regional Environmental Impact Statement of the works and activities considered in the plan or programme as a whole. It includes the types of works regularly submitted to the Federal Environmental Impact Assessment Proceedings.

In spite of the lack of specific regulations related to SEA, some of these assessments have been done in Mexico due to requirements established by international banks, which finance projects of different economic sectors in the country.

The main purpose of this paper is to present the experiences, results and conclusions obtained by using a methodology designed to assess the impacts of irrigation projects at a national level. Mexican Environmental Law and Regulations, internal organization of environmental authorities, as well as some external requirements from

international financial agencies are briefly analyzed as part of the methodology.

Key words: *strategic environmental assessment, sectoral environmental assessment, methodology, irrigation projects*

PUBLIC PARTICIPATION FOR RESTORATION OF THE SANBANZE TIDAL FLAT - OUTCOME OF THE BIGGEST ROUNDTABLE IN JAPAN

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Sanbanze tidal flat is located in the inner part of the Tokyo bay, next to the Tokyo Disney Land. Despite its location in the center of the megalopolitan area, Sanbanze is important habitat for waterfowl, fish and shellfish, and is recognized as a candidate of the designated area of the Ramsar convention by the Ministry of the Environment Japan. Although a reclamation plan of this area was cancelled in 2001, a number of problems have yet to be resolved. The seashore is surrounded by artificial vertical seawalls, and people can hardly access the tidal flat, except for a very limited area. The tide and current had been changed by the reclamation of the surrounding area, and the total catch of fish has decreased. In January 2002, Ms. Akiko Domoto, the governor of the Chiba prefecture, started the Sanbanze Roundtable. The author is one of the 24 members of the roundtable. The task of the Roundtable was to prepare the plan for restoration and conservation of Sanbanze. Including sub-committees and working groups, meetings related to the Roundtable were held more than 160 times in 2 years. All the meetings were completely open to public. The Roundtable submits the Sanbanze Restoration Plan in January 2004. This paper describes how the Roundtable operated and points out various lessons.

Key words: *public participation, roundtable, tidal flat, Ramsar convention*

REMOTE INDIGENOUS HOUSING IN AUSTRALIA - A SOCIAL ASSESSMENT

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Social Assessment, although better known in the area of natural resource management, provides a methodology that has wide application. Its balance between primary and secondary information and the emphasis on key issues enables focused problem-orientated research. This is illustrated through discussion of a policy research project into remote indigenous housing in Western Australia and the Northern Territory areas of Australia. The provision of adequate remote indigenous housing has long been a contentious issue in Australia. Attempts to meet this need have led to the development of a wide range of housing and housing-related programs in remote indigenous communities. These programs tended to remove involvement in housing from communities to external program and project managers. The current challenge is to find ways to integrate the plethora of programs while promoting the concept of indigenous governance. The complexity of the institutional environment addressed by this research project led to the development of an additional social assessment tool. This tool, called institutional mapping by the multidisciplinary research team, provided a mechanism to both understand the different programs as well as a starting point for program-integration workshops and interviews. This paper discusses the research project, the social assessment methodology used as well as the institutional mapping tool developed as a result of the institutionally complex project environment.

Key words: *social assessment, housing*

STRATEGIC ENVIRONMENTAL ASSESSMENT AND STATE ECOLOGICAL EXPERTISE: COMBINING INCOMPATIBLE?

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Unlike western states, the former USSR republics still apply the old Soviet procedure, State Ecological Expertise (SEE), to literally all developments, at both project and strategic-levels. More and more practitioners in these countries acknowledge nowadays that SEE alone is marginally capable of coping with the increasing pressures on the environment. Some of these countries have already adopted EIA as the basic environmental assessment procedure, but the adoption of Strategic Environmental Assessment (SEA) is considerably more difficult to introduce in these countries due to the more than 70 year-old traditions of central planning and secrecy. However, the experience of the Moscow City Master Plan to Year 2020 (MCMP) developed in 1997-1999 showed that there are, in fact, ways to successfully 'inject' at least some basic SEA principles into the SEE procedure. It was the initiative of the developers of the Plan to obtain public comments on the MCMP documentation and to further take them into account, thus establishing a precedent in the history of Moscow city planning. Besides, the MCMP considered alternatives to various sections of the Plan and

took into account environmental, social, health and sustainability considerations. Despite all drawbacks, the Plan's developers demonstrated how SEE can be possibly improved and brought into conformity with international SEA requirements through intermediate stages rather than through revolutionary reforms of the existing system. The appropriateness of such approach was confirmed when several regional authorities expressed willingness to take on-board the experience of the MCMP developers. Taking into account the fact that SEE is currently the only way to check environmental soundness of strategic-level developments in more than 10 countries, this experience could provide various participants of this procedure across the region with vital information, especially if supported by further evidence of the success of this new approach.

Key words: *SEA, Russia, Moscow City Master Plan, state ecological expertise*

SEA IN LAND USE PLANNING—COMPARING APPLICATION IN CANADA AND TRINIDAD

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The use of Strategic Environmental Assessment (SEA) has been formalized at the federal level in Canada through a Cabinet Directive requiring the conduct of an SEA for certain policy/program/plan proposals. The use of SEA at a provincial or municipal level has largely not been formalized. Nevertheless, there has been some use of the SEA framework for the formation of municipal land-use development plans. The application of SEA in these cases has been voluntarily applied and has not been as a result of legislation. These land use development plans, otherwise known as municipal 'official' plans, specify policies to guide long-term development. Although the 'official plans' are formed under planning legislation that is distinct from other EA legislation, the SEA approach has been used as a basis to review and assess alternative land development policies. To set the context for the paper, the land development process in the Province of Ontario will first be reviewed followed by an examination of the role and value of SEA as a framework to guide the formation of land development plans. This paper will then examine and compare case studies in Ontario where SEA has been used as a framework to guide the development of municipal official plans. Issues to be examined include: why SEA was selected as an appropriate framework; the value SEA provided to the process; contrasting the SEA approach to a more typical approach to plan formation; and describe the challenges encountered. The Canadian experience of SEA application will then be compared to experience in Trinidad where SEA is being considered as a tool to help guide land development in undeveloped areas and in areas subject to competing and conflicting land uses. Specifically, the challenges of applying SEA for guiding development planning in a developing country will be explored.

Key words: *SEA, land use planning, developing country*

COMMUNITY BENEFITS FROM OFFSHORE PETROLEUM ACTIVITY

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Coastal communities faced with offshore petroleum activity commonly see it as threatening their economic and social well-being. As a consequence, such communities are often largely reactive, trying to stop the activity or limit its negative effects, while at the same time hoping to achieve some share of any economic benefits. Even in regions that are generally 'pro-development,' the maximization of local benefits is often ignored or treated less diligently than the mitigation and prevention of adverse environmental, social and economic impacts.

This paper explores these responses and argues for more proactive and strategic approaches. It first outlines common community responses to offshore petroleum activity. It then provides jurisdictional and sectoral case studies, from Newfoundland and tourism, to show how such activity can deliver sustainable social and economic development. Lastly, it describes the types of approaches and tools required in order to achieve this. These are based primarily on cooperation and collaboration between the local community, their governments and the petroleum industry, and recognize and seek to optimize the wide range of social, economic and environmental effects of the industry. They include social impact assessments, socio-economic environmental protection plans, impact and benefit agreements, and benefit plans.

Key words: *socio-economic, community, benefits*

INDUSTRIAL MEGA-PROJECTS: CONFRONTING COMMUNITY EXPECTATIONS

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Prospective large-scale industrial activity is commonly initially seen as threatening community well-being. It is expected to cause boom and bust, inflation, social disruption, and damage to traditional industries and the environment, while benefiting few local people and companies. It is also thought that the benefits will be of limited duration and that the activity will leave a negative socio-economic and biophysical legacy. Such expectations result from the image of industrial activity, the emphasis environmental assessment processes place on negative impacts, and the fact that recent community economic development theory and practice largely reject such activity, preferring small-scale and community-based approaches. As a consequence, companies seeking to develop new projects are often confronted by communities and governments that are largely reactive, trying to stop activity or limit its anticipated negative effects, while hoping to receive some benefits. This can cause industry to experience project delays and increased costs, and local communities may see potential benefits delayed or foregone. Based on first-hand experience with mega-projects in Canada, the United States, Iceland and Australia, this paper explores the opportunities for more proactive and strategic approaches. It first describes initial community responses, based largely on the authors' recent experience in British Columbia; its offshore has been under petroleum activity moratoria since 1959, and government interest in lifting them has generated strong objections by environmental, First Nations and other groups. It then discusses the ways in which the effects of such activity can be optimized through cooperation and collaboration between the industry and local stakeholders, using approaches that recognize and seek to optimize the wide range of positive and negative effects of such activity. This includes contributing to sustainable economic and social development. Selected optimization tools, and the broader requirements for success, are discussed.

Key words: *mega-projects, effects management, industrial benefits, sustainable development*

THE USE OF PRINCIPLES, CRITERIA AND INDICATORS IN RELATION TO STRATEGIC ENVIRONMENTAL ASSESSMENT OF LAND-USE PLANS

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The need for an early application of SEA in land-use planning is inevitable. The late acceptance of SEA in the planning process often means a limitation to find a possible fundamental alternative solutions to the problem (e.g., the project will not be licensed, or it will be without the substantial policy alternatives).

On regional and local level plans and settlement dimensions a lot of decisions are taken. These decisions are legally binding for plans on hierarchically lower levels. We should have in mind that, in many countries, sectoral plans have only directive effect for the location of different activities in space. Their realisation is dependent on the decision under land-use planning process.

The evaluation of spatial and cumulative effects is expected from SEA and mainly from SEA in land - use planning process, the one which represents inter-sectoral planning.

No matter what methods are applied, the social system of values and targets is always the main decisive normative basis. Without this, it is not possible to transform the description and quantification of environmental potentials and factors into their evaluation.

Environmental quality evaluation criteria, being the basis of environmental potential determination, are also a basis of environmental assessment of a project, programme, plan or policy. So it is an assessment of how the realisation of a certain intention can influence the current (actual) potential of the affected area not only in ad hoc but in a trajectory of its predicted spatial development.

The paper is then focused on the use of environmental, social and economic principles, criteria and indicators in the based on the case-study of SEA of Bratislava City land - use plan.

Key words: *SEA, land-use planning, environmental quality, cumulative effects, environmental principles, criteria and indicators*

THE STATE OF CURRENT PRACTICE OF ENVIRONMENTAL IMPACT STUDIES: THE CASE OF SMALL SCALE HYDROPOWER PROJECTS

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Environmental authorities can abort an EIA process of an Annex I or Annex II project, by refusing the respective EIA Report, on the grounds of technical or methodological insufficiencies, previously identified. However, it cannot be taken for granted that, once an EIA Report is formally accepted, as part of an EIA process, its quality standard is, consistently, of a satisfactory level. This paper summarises the results of a one-year research project aimed at assessing the quality of EIA studies carried out for a specific type of Annex II projects. A number of reasons made us select small scale hydropower dams for this research. An extensive survey was carried out to analyse all EIA Reports that were the basis of successful EIA processes involving this kind of small scale projects, under the old and the new legislation, that is, over the last two decades. Often times unnoticeable to the general public and the media, located in isolated areas upstream secondary rivers, these projects are likely to generate some significant environmental impacts, in particular on the aesthetic value and character of local landscapes and on pristine ecological habitats. And yet, they are usually regarded as environmental friendly projects designed to produce emission free energy. The design of the evaluation criteria benefited from the literature review on similar research projects carried out in other EU countries. The evaluation exercise revealed a number of technical and methodological weaknesses in a significant percentage of cases. A set of simple and clear cut recommendations is proposed twofold: to improve the current standard of EIA practice and to strengthen the role of the EIA Commissions, at the crucial review stage of the EIA process.

Key words: *quality of EIA reports, small hydropower projects*

USING PUBLIC PARTICIPATION DURING AN EIA TO GUIDE INDUSTRY TO SUSTAINABLE DEVELOPMENT

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Our EIAs should provide decision-makers, i.e., the developer and the regulating authorities, with sufficient information to decide whether a project will contribute to sustainable development or not.

This paper sets out a single measure of contribution by industry to sustainable development, based on the aggregate increases in people's quality of life. If the contribution of industry can be measured within its zone of influence and be shown to be positive and indefinitely enduring, then it can be said that the industry has contributed to sustainable development.

How do we measure quality of life? Maslow based his Hierarchy of Needs on people being motivated by their unfulfilled needs. Therefore, we can take the issues and concerns that people contribute during public participation for an EIA to be motivated by their unfulfilled needs, or by threats to those of their needs they have already fulfilled.

People from a range of different sectors of society contribute issues during an EIA. Their issues usually reflect needs or threats in all three dimensions of sustainable development: ecological integrity, social equity and economic growth. Categorising these issues in terms of the Needs Hierarchy gives us an indication not only of the threats to the fulfilled needs of people within the industry's zone of influence, but also of their unfulfilled needs.

This means public participation during the EIA should be a constructive process that includes some visioning for the future in which the industry proponent, stakeholders and the regulatory authorities all participate. The process could indeed be viewed as the first step towards an enduring "pact" between industry and its stakeholders.

It further means that the EIA specialists should in addition to the mitigation of negative impacts assess the degree to which the industry can assist to fulfil people's unmet needs, based on the issues raised, in each of the three dimensions of sustainable development.

The challenge for both the EIA public participation practitioners and specialists is to shift the paradigm away from focusing on mitigation of negative impacts to focusing on the enhancement of positive impacts, without creating undue expectations or turning the industry into a surrogate government.

Key words: *public participation, sustainable development, EIA, quality of life*

INTEGRATING INEQUALITIES IN HEALTH INTO EIA (ENVIRONMENTAL IMPACT ASSESSMENT)

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Local residents often feel shortchanged by statutory appraisal processes. The views and agenda of the external experts are often different from resident experts. This presentation will look at how issues of health change and health inequality

were addressed in an integrated environmental impact assessment (EIA) and health impact assessment (HIA). The EIA/HIA was carried out on two options for development and a do-nothing option. The development site is located in a densely populated urban environment in London. The population has high levels of need: there is a core of long-term residents with strong ties to the area. There are also a large numbers of people who have come to the area more recently. The site is bordered by transport infrastructure, private and public services and housing. At the time of the appraisal the development site was open space which had some all weather play areas. We will describe how we used structured observations to ascertain how the site is used as a social and health resource. Who uses the site at the moment? What do they do? When do they use it? How will they be affected by the proposals for change? We will describe how we worked with the residents' group and other networks to identify other issues connected with the development. Who doesn't use the site? Who would like to use it? The consultation continually picked up on issues which fall outside the remit of an EIA as specified under statutory legislation. We will describe how these issues were addressed and fed back into the wider report. This ensured that the appraisal was informed by an understanding of health, and other social, inequalities and the lived experience of people living adjacent to the site.

Key words: *HIA, environmental impact assessment, participation, social impact assessment*

IMPLEMENTING THE EUROPEAN SEA DIRECTIVE IN PLANNING: TODAY'S PRACTICE AND TOMORROWS INTEGRATION

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The Danish planning system today already takes environmental considerations into account while developing and implementing regional and municipal plans. The focus of this paper is to clarify as to how SEA accordance with the European Directive on environmental assessment of plans and programmes can complement the existing planning practice. The paper contains three parts.

Firstly, based on a questionnaire to 61 municipalities and a detailed co-operation with 3 municipalities the paper shows how the Danish municipalities today plan with regard to: a) the process itself, b) the methods used for public participation and environmental considerations and c) the internal organisation of the planning process.

Secondly, the paper presents the results from a workshop held with presentations from consultancies and municipalities. The workshop was used as an opportunity to try different ideas and alternatives on: a) the future working division between planning, SEA and Agenda 21 and b) how to integrate SEA in the process of formulating and implementing municipal plans. The second issue focused on the questions: When environmental assessment should occur in the planning process, how to do the assessment and who should make it?

Thirdly, the result from the questionnaire, the co-operation and the workshop are used in the paper to draw up and discusses different alternatives for how to make tomorrows integration work—covering procedural, methodological and organisational aspects.

Key words: *European SEA Directive, SEA, planning*

HIA IN THE ORANGE PLANTATIONS AND ITS CONTRIBUTION TO HEALTHY PUBLIC POLICY IN THE AGRICULTURAL SECTOR IN THAILAND

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Pesticide use in the orange plantations in the Fang Watershed area is an on-going controversial issue in Thai society. Since 1995, oranges have become a new popular crop, as its price was higher than the other main crops. Consequently, the orange-growing areas have rapidly expanded. At present, it is estimated that the orange plantation areas in the Fang Watershed are more than 16,000 ha.

The Fang Watershed area is one of the most important natural forest areas in Northern Thailand. Therefore, the plantations that have been using vast amount of pesticides, has caused many problems to local communities e.g., bad odours, polluted water, deforestation, and illegal migration of foreign labor. The local communities tried many times to complain with the local authorities. But their voices were vanishing.

By the end of 2002, the HIA study had been initiated by a local NGO. The project is a truly participatory research as the local villagers, who have been affected from the plantations, are the majority of the research team. The study aims to provide the evidence-based information to support their learning process in health impacts surveillance. It is found that there are two significant impacts; namely physical health e.g., skin rash, dizzy, difficulty breathing, and social impacts such as community conflicts, quarrel and collapse of communities' relationship.

Along the study process, the health impacts have been communicated with the public through various mass media. In September 2003, the Ministry of Natural Resources and Environment has been mandated by the Prime Minister to solve the problems of the orange plantations and a number of ad hoc committees have been appointed. The results and consequences of the working process as well as the public policy process are still to be followed.

Key words: *health impact assessment, pesticide, public policy*

TOWARDS INTEGRATED IMPACT ASSESSMENT

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Tools for appraising plans and programmes are developing at a rapid rate. In the UK Strategic Environmental Assessment and Sustainability Appraisal are barely bedded in yet practitioners are already looking beyond these tools. This presentation describes work to develop an integrated appraisal tool on behalf of the London Health Commission. The tool will be initially applied to Sub-Regional Development Frameworks for London. EC Directive 2001/42/EC will require an environmental assessment of certain plans and programmes. The Directive must be enacted by July 2004. It will apply to a range of plans and programmes, including land use and spatial plans. Integrating different tools is challenging. In the case of plans and programmes that fall under the SEA Directive, the ultimate aim of this work would be an approach which is fully compliant with the Directive but which is enriched with the essence of other tools. A balance needs to be struck to incorporate other tools in a meaningful way without producing something that is unwieldy. Different tools bring different approaches to the assessment of effects. Can these perspectives be combined? In the UK there are appraisal tools which integrate different approaches but they lack many of the steps required by the SEA Directive. Perhaps equally as important as using an integrated appraisal tool is the use of an integrated team to use it. Resourcing could therefore provide a challenge. Integrated impact assessment is an ideal. Caution is needed in how the term is used. A genuinely integrated tool provides the opportunity to appraise plans and programmes against a range of economic, social and environmental considerations. Currently in Europe we suggest that a central attribute of an integrated approach is that it enables compliance with the requirements of the SEA Directive.

Key words: *SEA, HIA, integrated appraisal*

COMMUNITY-BASED REMEDIATION OF ENVIRONMENTAL LIABILITIES IN BOLIVIAN SMALL-SCALE MINES

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This paper discusses the process and the results of four small-scale initiatives to remediate environmental liabilities arisen from past and present mining activities in Bolivia. Tailings disposal and acidic waters draining directly to rivers resulted in extensive environmental damage and related social impacts. Reduced crop productivity due to irrigation with contaminated water and inadequacy of water for cattle consumption are among the factors that led to vigorous protests staged by peasants living near the mines. An international cooperation project was an opportunity to implement demonstrative remediation projects and to evaluate results. Measures included: (1) constructing a tailings dam to store tailings from forty small polymetallic ore treatment plants; (2) constructing three liming plants to raise water pH and promote metal precipitation; and (3) constructing wetlands seeded with the local reed totora to retain metals. Besides pressing for a solution, the community has been involved in planning, construction and operation of facilities. Different partnerships have been established among local communities, private/cooperative sector, and government agencies both at local and national levels. Significant benefits resulted from investments reaching US$ 450,000: about 900 hectares of land have again been suitable for irrigation, benefiting some 20,000 families. Direct and indirect social benefits include raising income for beneficiary communities, agricultural products feature better quality, jobs and income have been created during construction, local

workers have been trained in construction techniques, resolution of environmental conflicts opposing miners and communities, partial mitigation of environmental impacts in the upper Pilcomayo basin, a source of transfrontier pollution.

Key words: *small-scale mining, acid mine drainage, community involvement, environmental remediation, Bolivia*

POLICY INQUIRY THROUGH IMPACT ASSESSMENT: INSIGHTS FROM POLICY ANALYSIS

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This paper will explore the insights of policy analysis for EA. The core argument will be that EA should be conceived as a democratic process of policy inquiry. Several fields of policy research will be explored, including the "argumentative turn" in policy analysis, and recent moves to recall the theoretical roots of policy analysis in Laswell's "policy sciences of democracy." Based on this work, the paper will suggest that EA is better thought of as an interactive social process of communication, rather than as a technical input to "the decision." Interestingly, this approach recalls Caldwell's aspirations for EA as a process that aims to inform policy making with foresight, wise judgment, and precautionary action - qualities which are more evaluative than analytical. Case studies of science-based environmental assessments will be drawn upon to illustrate the communicative nature of EA. These studies will also suggest the need for EA to be an interactive, dynamic and ongoing process if the realities of multiple participants, contestable information, and the capriciousness of policy making are to be constructively addressed.

Key words: *policy environmental assessment, strategic environmental assessment, policy analysis, communication, policy theory*

ANALYSIS OF THE FOLLOW-UP STUDIES OF MAJOR REGIONAL TRANSPORTATION PROJECTS

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The study concentrates on Finnish transportation projects. Besides having outstanding role in regional transportation network, they also represent projects carried out in areas of significant environmental values. Motorway between towns Kemi and Tornio in northern Finland was completed in 2001. The EIA was carried out in 1995-1996. Ground water risks (one Natura 2000 Conservation Programme area), impacts on threatened plants and on landscape as well as cultural heritage were identified as significant effects of the project. The follow-up studies carried out after the EIA focus on noise and ground water issues. The bridge from mainland to Raippaluoto Island in western Finland was completed in 1997. The EIA was initiated in 1993, but was suspended and never actually completed. However, the follow-up studies were started already before the bridge was completed. The main issues in the studies are impacts on natural environment as well as social and socio-economic impacts of the bridge. The EIA of the fixed link between mainland and Hailuoto Island was carried out in 1992-1993, but the project itself is still pending. The project has resurfaced again due to the Regional Master Plan, which is expected to be ratified soon by the Ministry of Environment. Hailuoto Island is probably the most valuable and protected island in Finland. Thus, it is no wonder that the project is very controversial in the region. The study in hand analyses the three EIAs and follow-up studies, compares the assessed impacts to the actually detected changes and, in terms of the case Hailuoto, seeks new approaches to possible further assessments and follow-up studies. The study also raises questions on the roles of different authorities in follow-up as well as brings in speculations whether the recent follow-up studies really concern all the relevant issues.

Key words: *follow-up, transport infrastructure*

EXPERIENCES FROM NORWEGIAN AND NORDIC CASE STUDIES ON SEA

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The paper will summarise the findings of Norwegian and Nordic case studies on strategic environmental assessment, and will focus on some methodological challenges for carrying out SEA. What are the obstacles that have been observed relative to SEA becoming an efficient environmental policy instrument, and what efforts and measures are necessary in order to achieve its full potential? Some of the issues that will be discussed:

- What are the formal requirements for SEA, and what kind of framework and guidelines has been developed for carrying out SEA?
- How is the SEA-process documented in reports, etc.?

- To what extent is public participation ensured in the SEA process? - Does the system rely upon transparency, openness and public participation in the decision-making and in the monitoring of the development process?
- What are the challenges that can be seen relative to the requirements of the EU Directive on environmental assessment of certain plans and programs? The paper will also discuss the role and position of Environmental Impact Assessment and Strategic Environmental Assessments relative to the objective of achieving sustainable development. We will discuss the relative importance and positioning of EIA and SEA, and the environmental management and planning system in general: How does it relate to; how is it influenced by; and how does it influence other, high-level, policy making and overarching decision making in society? That is; where is the SEA taking place? How important is it for the overarching decision making and policy formulation?

Key words: *SEA, planning, policy making, sustainable development, EIA*

DOES HIA HAVE AN IMPACT ON DECISION-MAKING PROCESSES? METHODOLOGICAL ISSUES AND PRELIMINARY RESULTS FROM A 14-COUNTRY STUDY

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Many countries in Europe are developing HIA at a national, regional or local level. However, there is a growing concern about HIA in regard to its effectiveness: Does it really make a difference? To what extent does HIA influence policy decision-making? What are the factors that explain success and failure of the implementation of HIA? In order to produce this evidence the ECHP WHO Regional Office for Europe/European Observatory on Health Care Systems has started a project on "The effectiveness of HIA." The study is co-funded by the European Commission. The study includes 15 partners from 14 countries and a European NGO. To assess the effective implementation a set of indicators has Output: a) do the decision makers consider recommendations from(been designed. assessment; b) do the decision makers give reasons for not adopting a recommendation from assessment; c) do the decision makers alter proposals due to (assessment; d) is the decision derived from the assessment implemented. Structure: a) community/health stakeholder involvement; b) scope of resource input (financial, human, time); c) staff competence to initiate assessment, d) the number and the background of staff available to carry out the assessment; d) the degree of formal obligation to carry out HIA (legal basis, administrative (routine, opportunistic); e) any existence of a reference or steering group. Process: a) how best the available evidence is collated; b) community/stakeholder involvement by frequency and role (excluded, observing, public hearing, advising, joint decision making); c) any activities and Feedback: a) are mechanisms for(interventions of reference or steering group evaluation in place; b) is evaluation carried out for all HIA related decisions; c) are the results from the assessment feeding into the decision making process. Preliminary results of the application of these indicators will be presented.

Key words: *health impact assessment, Europe, decision-making process, implementation, effectiveness*

MAPPING THE USE AND CONTEXT OF HEALTH IMPACT ASSESSMENT ACROSS EUROPE: METHODOLOGICAL ISSUES AND PRELIMINARY RESULTS FROM A 14-COUNTRY STUDY

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A Previous European mapping exercise (Welsh Assembly Government, EuroHealthNet 2003) has produced anecdotal evidence that health is taken into account not only in HIA, EIA or IIA but also in other activities, such as a) intersectoral structures, b) audits of public administration, c) inter-ministerial working groups, d) through land use planning, e) budget and planning process of governments and ministerial departments, f) national and international environmental requirements, g) government memoranda, h) staff appraisal and review systems. What sort of HIA is employed in these countries? What different methodologies and processes take health into account? How well is health included in the various activities? On what level (national, regional, local) do these activities take place? What policies are being assessed? What sectors are addressed? Who is in charge of it and what is the legal basis for these activities? What are the differences in HIA-profiles of countries? Why are some countries more

active than others? Why do some countries use other methodologies to take health into account than others? In order to produce the evidence and answers to these questions, the ECHP WHO Regional Office for Europe/European Observatory on Health Care Systems and Policies has started a project on "The effectiveness of HIA." The study is co-funded by the European Commission. The study includes 15 partners from 14 countries and a European NGO. A policy analysis and an organizational analysis will be carried out. These analysis are based on a number of methodologies employed in the study which will facilitate the mapping of the use of HIA and its context: a) literature review, b) interviews with key informants, c) review by expert panel. The presentation addresses methodological issues and preliminary results from the mapping exercise.

Key words: *health impact assessment, Europe, mapping, context*

STRATEGIC AND REGIONAL ENVIRONMENTAL IMPACT ASSESSMENT FOR NORWEGIAN PETROLEUM DEVELOPMENT PROJECTS OFFSHORE

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Since 1997, Regional Environmental Impact Assessment (REIA) has been implemented as a tool for improving the quality and efficiency making of the EIAs of the petroleum activity of the Norwegian Continental Shelf (NSC). The experience so far is that these objectives are met. The REIA is covering all relevant environmental impacts and to a certain extent socio-economic impacts for all existing, planned and foreseen projects within the region. NCS is divided into three regions, the North Sea, the Norwegian Sea and the Barents Sea. For the first two regions, REIAs have already been prepared and are currently being updated. For the Barents Sea, no REIA has been prepared because only one project has been approved so far (the Snow-white LNG-project). The Barents region is located within the Artic Region and the environment is regarded as sensitive by the authorities and NGO's. Because of that, the existing Norwegian Government decided to stop all petroleum related activity within the region, except the approved LNG-project, until a Strategic Environmental Assessment of the Barents Sea had been conducted. This assessment has been prepared and has been on a public review (autumn 2003), and the Government has opened a part of the region for limited activity. Parallel to this assessment, separate impact assessments of the fishery activity, the transportation activity and the rest-activity including background pollution are being prepared. Based on these assessments, the authorities will prepare a Total Management Plan for the region, which will consider the further development of petroleum activity. This SEA-process has so far been a controversial issue in Norway. Similar SEA-processes may be started for the other regions by the authorities. This might influence the REIA work already being conducted by the petroleum industry within the region.

Key words: *SEA, REIA, petroleum industry*

ENVIRONMENTAL MANAGEMENT PLANNING IN EIAS FOR NEW INDUSTRIAL ESTATE PROJECTS IN ENGLAND

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Environmental impact assessment (EIA) and environmental management are two key tools for identifying and controlling the affect of actions on the environment. There is a strong case for advocating a formal and practical linkage between the two across the point of decision at which the planning of an action becomes its implementation. This is particularly so because much of the work undertaken for EIA is directly relevant to subsequent environmental management strategies.

However, linking EIA and environmental management has proved problematic in the past due to the differing origins and purposes of the two tools and to the understandable pre-occupation with achieving acceptance and developing practice. Now, though, EIA is a maturing tool, environmental management systems such as ISO14001 are rapidly growing in popularity and business, government and the environmental industry are developing the awareness, experience and skills necessary to drive the development of practical links between EIA and environmental management.

This paper therefore investigates the degree to which recent EIAs address environmental management issues. To this end, a sample of recent environmental statements has been reviewed in respect to a key category of projects, industrial estates, in England. These developments are a key mode of large-scale commercial development and are highly planned and scrutinised, routinely subject to EIA and requiring a high degree of ongoing management control. The research examines the degree to which environmental management planning is reflected in the proposals contained in environmental statements, and proposes reasons that might contribute to the pattern of results found.

Key words: *environmental impact assessment, environmental management, industrial estates*

EIA CAPACITY BUILDING IN AFRICA—TRIALS, SUCCESSES AND ERRORS

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The ad-hoc nature of most EIA training so far provided in Africa and its all too common isolation from country-owned institution-building means that many opportunities have been lost and individual initiatives have not been followed-up. It is therefore encouraging to see that the Marrakech Declaration focuses on a coordinated initiative.

EIA capacity building should primarily respond to country-level needs, since EA legislation, implementation procedures and development works are mostly defined by country boundaries. At the same time, countries are in different stages of advancement with respect to EIA legislation and implementation, as well as general development, and therefore have a varying demand for EIA work and EIA capacity. Sub-regional cooperation can increase the demand for EIA capacity and improve utilization of existing capacity.

Sub-regional co-operation can also significantly enhance certain aspects in capacity development, but can only build successfully on countries that have a working system in place. During recent years, a strong but unstable capacity building program was built on sub-regional basis in Africa. However, it has proven difficult to build EIA capacity in countries without depending too much on a few strong individuals, making new institutional structures unstable in the event that these individuals leave the scenes or become unfunded. However, positive exceptions have occurred showing promise of sustainability when donors have been willing to maintain institutional support for a minimum number of initiating years. There are lessons learnt that can prove valuable for the planned Marrakech Action Plan.

Key words: *capacity building strategies, action plans, lessons learned, strategic environmental assessment*

ENVIRONMENTAL IMPACT ASSESSMENT AND IMPACT BENEFIT AGREEMENTS: CREATIVE TENSION OR CONFLICT?

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In northern Canada, a new paradigm for large project approvals has emerged based on land claims mandated environmental impact assessment (EIA) processes and on the negotiation of impact benefit agreements (IBAs). Recent experience in the Northwest Territories (NWT), Yukon, and Nunavut indicates that negotiated IBAs have emerged as a necessary adjunct to the public EIA process in order to secure the public support necessary for government approvals.

Aboriginal land claims enshrine new institutions of public government with a mandate for EIA. These co-management boards have important EIA jurisdiction including consideration of the socio-economic and cultural effects. Land claims also include provisions that ensure that economic and other benefits accrue to the regions affected because of development. These benefits are negotiated bilaterally between project proponents and aboriginal groups whose lands will be affected.

The negotiation of private IBAs can and has affected the broad goals of EIA in the north. Good EIA processes encourage public involvement and openness in decision-making. The content of IBAs, as private agreements with aboriginal peoples, are not part of the evidence considered in an EIA, but they are part of the mitigation of socio-economic and cultural impacts of large developments. The result is potentially a problem for a board which wishes to encourage an efficient EIA process but which must base its decision on a public record compiled during an EIA proceeding.

This paper will explore and describe:

1. The new frameworks for EIA and IBA requirements in Nunavut, Yukon, and the NWT.
2. Recent experience for large development approvals.
3. The tension between public EIA processes and private IBAs when they are brought to bear on the same development.
4. An approach to reconciling the use of these tools that encourages both effective public decision-making and the mitigation of the socio-economic impacts.

Key words: *impact benefit agreements, public involvement, land claims, socio-economic mitigation measures*

MINNOWS GET THEIR FREE WAY: AN EXAMPLE OF HOW DEVELOPMENT NEEDS WERE BALANCED WITH THE NEEDS OF THE ENVIRONMENT TO PREVENT THE EXTINCTION OF THE ENDANGERED MINNOW

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One of the many challenges facing engineers is to plan, design, construct and operate a road in harmony with the environment. Engineers have been attempting to do this for many years and have seldom achieved the ideal. The N4 Maputo Development Corridor Toll Road project in South Africa is a prototype project and example of how development needs were balanced with the needs of the environment.

The N4 Maputo Development Corridor Toll Road passes over a river that is home to the rare and endangered minnow. The endangered fish, scientifically known as *the Kneria auriculata*, is on the red data list. The planning of the N4 raised the question: How to change the design of the bridges crossing the specific river on the N4 Maputo Development Corridor Toll Road to accommodate this endangered fish species while catering for the usual practical constraints? The answer lies in the design and construction of the fish ladder to save the minnow from extinction.

The presentation will provide background information on the project and information on the minnow itself. The presentation will also explain how civil engineering principles were applied to save the minnow from extinction in South Africa.

This project represents an achievement, a balanced integration of practical engineering requirements and conservation of the environment. The project is an example of how considerable effort was expended to protect the environment, without compromising public safety.

Key words: *development needs, balanced, environment, minnow, fish ladder, integration*

COLLABORATIVE APPROACHES AND STRATEGIES FOR OIL AND GAS IMPACT MANAGEMENT

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A call to build on northern Canadian approaches towards Collaborative Approaches and Strategies for Oil and Gas Impact Management grew out of social and economic challenges facing the NWT as a result of expanded growth. Challenges include

- Establishing institutions that recognize the role of northern interests in decision making
- The rapidity of change, the pace and scale of non-renewable resource development
- Social and economic conditions that are far poorer than communities in the rest of Canada
- Limited capacity and a weakened social fabric to sustain the integrity and identity of the people and communities.

The life cycle of oil and gas development in northern Canada is moving beyond the exploration and initial field development phase as conceptual designs for major pipeline systems will serve as a catalyst for the entire region. The proposal for a Mackenzie Valley natural gas pipeline is in the conceptual design phase and will stimulate expansion of development activity throughout the region. Options for broad consideration to manage social and economic impacts caused by upstream oil and gas developments were developed. Information and research was made available so all parties can effectively participate in negotiations and decision-making with respect to developing petroleum resources and infrastructure. Extensive reviews of Canadian and international impact management practices as well as northern Canadian projects, agreements and practices. Key industry, government, community leaders and practitioners were consulted.

Key words: *social and economic impact management, negotiations, aboriginal, petroleum industry*

THE FIRST SOCIAL IMPACT ASSESSMENT OF A DEVELOPMENT PROJECT ON AINU CULTURE IN JAPAN

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In 1997, the Nibutani Dam court case concluded with a judgment from the Sapporo District Court that the Government of Japan had failed to give sufficient consideration to the impact that the construction and operation of the dam would have on the local Ainu culture. The judgment required the proponent to conduct an impact assessment prior to the construction of future development projects. Currently, the Government plans to construct another dam in the same region and has funded the local community of Biratori to conduct the required impact assessment. In April of 2003, the people of Biratori formed a research group and have been working to assess the possible impact of the second dam on the local Ainu culture. Social Impact Assessment is relatively new in Japan. This is the first such study to assess the impacts of a development project on Ainu culture. Furthermore, since this assessment focuses on the impact on Ainu culture, it requires a sensitive approach in order to engage the relatively few Ainu elders. For this reason, the local people decided to take up the responsibility of conducting the impact assessment themselves, with assistance from social scientists and other

experts. The research group has implemented a research design and are employing research methodologies adopted from impact assessments conducted overseas, modifying them to meet their local situation and needs. This paper reviews the over-all process of their effort to plan and conduct the impact assessment, with a focus on the research design and methodology being used to assess the impact of the proposed dam on the local Ainu culture.

Key words: *dam, Ainu, impact assessment, Japan*

TRANSPORTATION ISSUES IN IMPACT ASSESSMENT IN NUNAVUT, CANADA

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Northern Canada is noted for its remoteness, marked by lack of ground transportation routes, as well as its significant mineral resource potential. Mining companies are vigorously exploring in Nunavut, where the ability to transport supplies represents a large economic and logistical challenge to projects. The most common forms of proposed transportation are by winter or all-weather road, barge or ship, or by air, with planes landing on ice in winter or year-round on airstrips built at project sites. Concern has been raised regarding the potential rapid growth of fragmented road, air, and shipping systems in Nunavut, to access mineral deposits.

In this setting, important factors in impact assessment (IA) of transportation components of development projects include appropriate scoping of the spatial extent of the transportation links, transboundary impacts, cumulative effects assessment, and alternatives assessment of transportation methods. Scoping transportation components and use of those routes, is challenging, as the spatial extent or links to existing routes with comparable uses are not always obvious, particularly where new routes are being established. Transboundary issues arise as routes cross into neighbouring jurisdictions with different IA regimes or impact transboundary wildlife resources.

Alternative means to ground transportation need to be examined in the context of alternative energy sources. At present, most proponents rely heavily on ground transportation to make the transportation of large volumes of fuel required for diesel energy generation in remote sites economical. A further challenge is to recognize and assess the potential of cumulative effects to mineral and wildlife resources from establishing a new corridors or links in Nunavut's transportation network.

As Nunavut continues to promote business in the north, the reality of limited transportation links in a remote landscape continue to surface and provide proponents and impact assessment practitioners a sizeable challenge.

Key words: *transportation, Nunavut*

SEA TO SKY HIGHWAY AND ACID ROCK DRAINAGE: A MODELING APPROACH TO ASSESSMENT OF POTENTIAL ENVIRONMENTAL EFFECTS

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The B.C. Ministry of Transportation is proposing to upgrade the Sea-to-Sky Highway between Horseshoe Bay and Whistler. This is one of the commitments made in the City of Vancouver and Resort Municipality of Whistler bid to host the 2010 Winter Olympic Games. This highway traverses steep and mountainous terrain. As such, the road improvements will require substantial rock cuts.

Golder Associates Ltd. assessed the potential for acid rock drainage and metal leaching (ARD / ML) from proposed rock cuts and the environmental impact on the rivers and streams along the highway alignment, and on Howe Sound[CR1]. This assessment was incorporated into the application for a Project Certificate that is required under the British Columbia Environmental Assessment Act.

No regulations or guidelines exist in British Columbia to guide the analysis of potential reactive rock material encountered during road construction or the assessment of potential environmental effects from this material. Consequently, an assessment methodology was developed using guidelines established for the mining industry (Price, 1997).

The environmental impact assessment involved geological mapping and laboratory testing to characterize the ARD / ML potential of rocks along the highway. Results of the ARD / ML testing were coupled with the results of a hydrologic analysis to predict metal loading to streams. The predicted stream concentrations were assessed in the context of sensitive aquatic organisms known to occur in the drainages.

The potential environmental effects from handling and disposal of excavated rock were also considered and mitigation options proposed.

This paper will focus on the methodology employed and the extent to which it may be transferable to other construction projects. The unique characteristics and challenges of the Sea to Sky corridor project will be highlighted.

Key words: *Sea-to-Sky highway, acid rock drainage/metal leaching, British Columbia Environmental Assessment Act*

IPM IMPACT ASSESSMENT AND THE ART AND SCIENCE OF RISK COMMUNICATION

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Farmers and consumers in developing countries are too often faced with a serious dilemma: either sacrifice a significant share of their crops to pests or use highly toxic pesticides that can harm human health and the environment. If we can help these people out of this dilemma, we will be making a major contribution to improving food security, eradicating starvation, and alleviating poverty in resource-poor countries throughout the world. Recognizing the importance of agricultural inputs in food security and the reputational risk associated with the use of very toxic agricultural chemicals, the World Bank developed revisited on integrated pest management (IPM) to ensure good practice in its projects. IPM succeeded in developing environmentally sound practices but struggled to communicate the value of information on risk and benefits of IPM. The slow adoption of IPM is often attributed to the widespread gaps in farmers' knowledge and understanding of the complex and controversial issues surrounding pesticides and IPM . In this paper, we will address IPM and risk assessment not only from the economic, environmental and public health perspective, but also from a communication and consensus building point of view. Communicating about IPM, pesticides and associated risks hinges on the ability to earn the public's confidence, raise its awareness and understanding and addressing their perceptions .Risk communication, defined as an interactive process of exchanging information and opinions among individuals, groups and institutions (NRC, 1989), is a challenging task. It provides multiple messages about the nature of risk and other messages that express concerns, opinions, or reactions to risk messages or risk management. It therefore implies a deep capacity to listen to different stakeholders in a systematic and scientific way, but also the creativity to elaborate multi-faced communications programs which can help bridging the gaps between knowledge, behaviours and practices.

Key words: *integrated pest management, pesticides, risk communication, public participation, impact assessment*

USING ENVIRONMENTAL ASSESSMENT TO UNDERSTAND AND MANAGE THE EFFECTS OF OIL SANDS DEVELOPMENT IN NORTHERN ALBERTA

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Alberta uses environmental assessment as a means of understanding the effects of major industrial, water management and recreational developments. As the scale of development has changed, so has the province's approach to understanding and assessing environmental effects. This is particularly important in northeastern Alberta where the development of the Fort McMurray-Athabasca Oil Sands is occurring at an unprecedented rate. This paper examines the role of Alberta's Environmental Assessment Process in the regulatory decision-making process for oil sands development. The orderly development of energy resources in Alberta, including oil sands reserves, is regulated by the Alberta Energy and Utilities Board (EUB). Provincial Ministries such as Alberta Environment, Alberta Sustainable Resource Development, and Alberta Community Development may also have regulatory responsibility for various aspect of development. Therefore, Alberta uses an inter-departmental, multi-disciplinary team-based approach to evaluate the integrated application for an oil sands project. This application includes an Environmental Impact Assessment (EIA) Report prepared under Alberta's Environmental Protection and Enhancement Act (EPEA). When federal agencies also have an environmental assessment requirement, provincial and federal agencies conduct a cooperative assessment of the project. A EIA report provides decision-makers and other stakeholders with an understanding of the nature of the project, the environmental and socio-economic setting for the project, the effects of the project on that setting, appropriate mitigation to minimize adverse effects, and systems required to monitor and manage residual adverse effects. Information from the application and EIA report is used by regulatory decision-makers to determine if the project is in the public interest and to identify operating and environmental management requirements. Approvals issued by Alberta Environment provide long-term management of regulated activities and protection of environmental quality.

Key words: *Oil Sands, EIA report, EPEA, team-based review, environmental management systems*

IMPACT ASSESSMENT OF SCALE CHOICES IN SCOPING

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Selecting a scale for the scoping of the problem is an important and challenging activity at the start of any SEA or EIA study. This activity often does not receive the amount of attention it deserves. The adoption of a particular scale in a study sets bounds on the types of problems addressed, the kind of solutions to be found and the kind of impacts to be evaluated. It is therefore important to realise that scale has a strategic value and is not politically neutral: the selection of scale may intentionally or unintentionally privilege certain stakeholders. For this research a distinction is made between three types of scale choices that are closely interrelated:

- Selection of spatial scale: large (river basin, national) or small (channel, local)
- Selection of local of temporal scale: long term or short
- Selection of level of aggregation: amount of detail.

The selection of scale always involves a trade-off because no perfect scale exists. Some examples of dilemmas that may play a role in making scale choices:

- Long term versus short term interests. Long term and short term interests may be conflicting. Economic considerations are primarily based on short term objectives whereas ecological concerns have a long term scope.
- Small scale versus large scale (system boundaries): By broadening the scope, more (and maybe better) solutions may come into the picture, but this also involves more complexity. Also, on a larger scale, more impacts may be taken into account. In this paper, examples in water management (Scheldt Estuary, water shortage) will be used to illustrate how scale choices are made in practice and what the consequences of scale choices are for the outcomes of interests of the scoping and the assessment. The point will be made that scale choices can be used as a framing instrument.

Key words: *scoping, scale choices, assessment*

RANDLE REEF SEDIMENT REMEDIATION: ENGAGING PUBLIC PARTICIPATION

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Randle Reef, at the west end of Lake Ontario, has the greatest concentration of highly toxic sediment within Hamilton Harbour. The sediments contain elevated levels of PAHs, which are persistent and carcinogenic and enter the food chain through fish, zebra mussels and other organisms. Randle Reef is among Canada's highest priorities for remedial action within the Great Lakes Basin.

Since 1995, there has been considerable input from stakeholders regarding the management of Randle Reef sediment. Major issues and concerns related to the various alternatives included the high costs and health risks of removal and treatment, lack of recipient sites for the removed material and infilling the harbour if contained in situ. These resulted in barriers to proceeding with a preferred approach.

In November 2001, Environment Canada formed a multi-stakeholder Project Advisory Group (PAG) to develop a mutually acceptable solution for Randle Reef. Participants represented 17 organizations, including federal, provincial and municipal governments, industry, shipping, local citizens, environmental non-government organizations, workers' safety, and technical experts. In a series of meetings, PAG members expressed the interests of their constituencies and voted on project alternatives.

The PAG meetings enabled stakeholders to agree on a solution that had been ruled out during earlier phases of the environmental assessment: construction of a dry cap dyked containment facility about 9.5 ha (hectare) in size, to cover in-situ about 130,000 m3 of PAH-contaminated sediments and contain an additional 500,000 m3 from other toxic areas in the Harbour. Its proposed end use will be a mix of 1/3 naturalized open space and 2/3 port activities that include commercial storage and a channel suitable for ships of Seaway draught.

The Randle Reef Sediment Remediation project is undergoing a Comprehensive Study under the Canadian

Environmental Assessment Act. The proposed cleanup activities are anticipated to commence in fall 2004.

Key words: *public participation, stakeholder, Canadian Environmental Assessment Act, sediment remediation, PAGs, Great Lakes, Randle Reef, Ontario, Canada*

HOW ARE IMPACTS ON BIODIVERSITY ANALYSED IN EIA IN SWEDEN?

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The objective of this study was to investigate the implementation of the Convention on Biological Diversity (CBD) regarding EIA (article 14) and to study how impacts on biodiversity is analysed in Swedish EIA-documents.

The result shows that biodiversity in general is described in EIA-documents, especially influence on different habitats. However, species other than red-listed are seldom included, the landscapes are almost never analysed in ecological terms and field data is often very poor. There are also differences between sectors regarding how biodiversity is included in the EIA-documents, and in quality depending on whether the EIA is carried out by the project proponent or by a consultant. There are however examples of very good EIA-documents, especially those made for big road and railways projects by a group of experts. Nevertheless, the main problem with most EIAs is that long-term impacts on biodiversity are not included. Prediction tools to analyse effects of different projects are not used and normally such methods are not even requested by the authorities. From this we conclude that the quality of EIA-documents concerning impacts on biodiversity is low and must be improved in order to fully implement CBD article 14 in Sweden.

The result is based on 274 analysed EIA-documents from different sectors (industry, roads, railway etc.). This was combined with interviews of a number of key persons representing local and regional authorities, proponents and consultants with experience of EIA.

More specific we studied what kind of data EIA is based on, how data is presented and referred to, how species, habitats and landscapes are described, how consequences on biodiversity is analysed and what kind of prediction tools that are used.

Key words: *Convention on Biological Diversity, EIA, biodiversity, Sweden*

CUMULATIVE IMPACT ASSESSMENT FOR MUNICIPAL AND REGIONAL PLANNING—AN OUTLINE OF A SWEDISH RESEARCH PROJECT

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Research on cumulative impact assessment has shown that small cumulative impacts may result in greater environmental disturbances than a single particular action. Cumulative EIA (CEIA) is demanded by the European Union. However, CEIA is still not included in Swedish legislation.

The Swedish Environmental Code, states that the Swedish County Boards are responsible for determining - in parallel to the project developer - which types of impacts are to be assessed in the EIA, including in relation to other projects and plans.

The objective of this project is, firstly, to make a review of the international research surrounding the issue of cumulative impact assessment. Secondly we will study why cumulative impact assessments are being conducted. Thirdly, the research aims to demonstrate a method for conducting cumulative impacts assessment that will be possible to use in municipal and regional planning as well as for environmental protection and management.

The Swedish Environmental Protection Agency has not released any guidelines regarding CEIA. The reason behind this will be investigated in this research. No specific methodology for Cumulative environmental impact assessment (CEIA) has been proposed, but models are available from the USA National Council of Environmental Quality (CEQ, 1997) and the Canadian Environmental Assessment Agency (CEAA).

Given that Sweden has a different arrangement of political powers than USA and Canada, the research can bring to light which barriers exists in the implementation of cumulative impact assessment in the Swedish context.

Key words: *EIA, Sweden, cumulative impact assessment*

CONSULTATION PUBLIQUE SUR LE DEVELOPPEMENT DURABLE DE LA PRODUCTION PORCINE AU QUEBEC

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Le Bureau d'audiences publiques sur l'environnement (BAPE) est un organisme gouvernemental d'information et de consultation publiques sur les questions environnementales soumises par le ministre de l'Environnement du Québec. Le BAPE contribue au développement durable en donnant accès aux citoyens à l'information sur une problématique et la possibilité de s'exprimer avant l'autorisation par le gouvernement d'un projet ou d'une politique. Le BAPE réalise ses analyses à la lumière du développement durable.

Le 3 juillet 2002, le BAPE recevait le mandat de tenir une consultation publique sur le développement durable de la production porcine au Québec. Le mandat d'un an consistait à :

- examiner les modèles de production actuels et leurs impacts sur les milieux rural et agricole et sur le secteur de la transformation;
- établir un cadre de développement durable de cette production en tenant compte des aspects économiques, sociaux et environnementaux;
- proposer un ou des modèles de production favorisant une cohabitation harmonieuse des activités dans le respect de l'environnement.

La démarche de la Commission comportait trois étapes. Pour rassembler les connaissances, la consultation a débuté avec vingt séances thématiques où 60 conférenciers étaient invités. Ensuite, une tournée dans 16 villes a donné l'occasion aux citoyens de clarifier certains aspects en questionnant, via la Commission, des personnes-ressources de ministères et organismes. Enfin, une deuxième tournée régionale, réservée aux opinions et préoccupations, aura permis de recueillir 380 mémoires provenant de clientèles diverses et d'échanger en audience avec plus de 300 d'entre elles. Au terme de cette démarche et de l'analyse qui a été faite, le rapport, déposé au ministre de l'Environnement le 15 septembre 2003, est le reflet d'une réflexion collective de la Commission et des 9 100 participants aux 132 séances publiques pour analyser la problématique dans une attitude d'ouverture, d'écoute et de respect mutuel.

Mots-clés : *développement durable, participation du public, contribution de la population, analyse d'une problématique, expression des opinions et des préoccupations, méthodologie d'une démarche de consultation publique, examen d'impacts*

THE VISUALIZATION OF IMPACT ASSESSMENT

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Although the role of maps has never been an issue of attention in impact assessment, map images are the most frequently used models in EIAs. In the current age of information, the role of maps has made a fundamental shift from a rational information provider towards a discussion and negotiation instrument. In impact assessment maps are used both to present the current state of affairs and to present the outcomes of the analysis; demarcating the affected from the unaffected, stating the gravity of the impairment or expressing the benefits of the intended project. In this role, maps facilitate the discourse between actors of different disciplines and with different interests and intentions. In today's complex decision-making processes a scarce resource of the stakeholders is attention. In the dynamic and creative process of defining alternatives, some issues and problems are implicitly qualified as important to address. Those issues are paid attention to and visualized on maps. Perhaps even more important is what is NOT included. We have analyzed this process in several case studies. The cases show many occurrences of strategic use and at times counter-effective map use. Often this was due to a difference in intention, approach, line of reasoning (rationality) and vocabulary of participants. Concluding: maps are powerful tools for communication, but the message they convey is hard to control. The current use of maps in impact assessment as a device for presentation inhibits their potential use as powerful communicators. When used in the right way maps can have a constructive role as a tool for arousing creativity and for expressing and discussing options. Different visualization approaches and conscious map use in the strategic and design phases of EIA preparation is expected to lead to an improved discourse between participants.

Key words: *map visualization, rationalities, strategic behavior, communication*

SIA AND THE MINING INDUSTRY: EVOLVING EXPECTATIONS

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Private sector investors who want to develop resource-based projects are required to follow precise permitting procedures determined by the regulators. Government requires that an environmental assessment be conducted which ensures that a defined process is followed so as to predict the environmental and social effects of proposed initiatives before they are implemented. Social impact assessments (SIAs) allow for the identification of possible negative effects as well as formation and selection of project implementation activities that can contribute to sustainable development by introducing measures which ensure negative impacts are avoided or mitigated. When required or appropriate, an environmental monitoring program is designed and implemented to verify that the environmental impact assessment was accurate as well as to determine performance and effectiveness of the mitigation measures. Although follow-up monitoring is an accepted practice in the environmental assessment process, it is at the nascent stages in the private sector. For the International Financial Institutions (The World Bank, Asian Development Bank, African Development Bank, etc.) and bilateral aid agencies (CIDA, USAID, DFID, etc.), project evaluation is a widely accepted and well-defined practice which, when conducted at the mid-term review stage of a project, can provide valuable results-based operational lessons so that adjustment can be made to strategy, structure and methods of implementation if appropriate and/or feasible. This paper will discuss moving beyond SIA follow-up monitoring to incorporate more formalized evaluation techniques which measure project mitigation implementation in terms of their relevance, efficacy, impacts, sustainability and, where appropriate, efficiency. Examples will be drawn from the mining sector.

Key words: *environmental assessment, social impact assessment, follow-up monitoring, evaluation*

CHALLENGES AND APPROACHES IN ENVIRONMENTAL IMPACT ASSESSMENTS: WIND TURBINES AND MIGRATORY BIRDS

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The environmental impact assessment (EIA) process is a project development planning tool. Applied on a project-by-project basis, its primary purpose is to identify and mitigate potential negative impacts on important ecosystem components. An inherent difficulty is that project-specific level planning is not useful or even applicable to assessments at the regional level, which should be the approach used to assess wind farms. Environment Canada (Pacific and Yukon Region) has participated in several on- and off-shore wind farm EIA reviews and has three primary concerns with respect to migratory birds: 1) direct mortality due to collisions with turbine blades and related structures; 2) displacement of sensitive species from important areas or habitat types at critical times; and 3) cumulative negative effects at the population level for some vulnerable species. Non-avian impacts include road construction and transmission line corridors. Gaps exist in our understanding of the likelihood and extent of these effects. In this paper, we discuss a planning tool - an inference-based model at the landscape level - that could be used by government agencies and developers to help determine the best locations for wind farm facilities in British Columbia. In its development, important bird migration pathways would need to be identified, and correlated to time of year, wind strength and consistency, topography, and selected habitat features. Proximity to existing road and transmission networks must also be considered. The data collected from EIAs and other programs could be used to provide feedback to the model, in an adaptive management framework. We also discuss various challenges in monitoring facility impacts, including cumulative environmental effects.

Key words: *migratory birds, model, monitoring, adaptive management, environmental impact assessment*

THE STRATEGIC ENVIRONMENTAL ASSESSMENT PROCESS—A CASE STUDY OF JAMAICA

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Today, it is widely accepted that the integration of environment and development concerns can lead to the fulfillment of basic human needs. The Government of Jamaica has recognized that for achieving full economic and social development, the environmental costs and benefits of all processes must be evaluated. This approach towards realising that government as an entity can have negative impacts on the natural environment has resulted in the Government of Jamaica taking the appropriate steps towards incorporating environmental considerations into its policies, plans, programmes and operations.

Through the CIDA-sponsored Environmental Action (ENACT) programme and its implementation by the Canadian consortium Dessau-Soprin / Marbek, the Government of Jamaica is currently implementing a Greening of Government Programme, with a major focus on Strategic Environmental Assessment (SEA) process and policy. The Cabinet Office articulated that the introduction of a SEA process would represent an explicit acknowledgment that ministries of GOJ share a responsibility for environmental protection, are partly responsible for the current state of Jamaica's natural environment, and therefore need to consider the environmental implications of their policies.

The focus on SEA has come against a backdrop of policy making in the Government of Jamaica being described as rushed, reactive, focused on short-term considerations and suffering from the absence of a common approach to guide analysis. The GOJ has now adopted a number of measures aimed at strengthening its policy-making processes in order to address the deficiencies outlined.

This paper will present and analyse the following:

- The process of development of the SEA initiative
- A review of the GOJ SEA Policy and the institutional mechanisms required for implementation
- An outline of green procurement practices and how it may impact on the local industrial sectors
- The achievements, challenges, drawbacks, lessons learnt and applicability for other SEAs

Key words: *capacity building, greening of government, strategic assessment, policy making, green procurement, impact on industrial sectors*

IMPACT ASSESSMENTS AND SUSTAINABLE DEVELOPMENT IN CANADIAN URANIUM MINING

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All stages of uranium mine development in Canada meet rigorous environmental standards and environmental assessment is a component of several steps in the process. In the early 1990s, new uranium mine developments proposed for northern Saskatchewan were reviewed by a joint federal-provincial environmental assessment panel. This seven-year long process spanned a broad range of issues in technical and public panel hearings throughout northern Saskatchewan. Recommendations from the joint panel laid the groundwork for the development of an environmentally sustainable industry that places a high premium on community involvement. An environmental assessment panel that addressed the decommissioning of uranium mines in the Elliot Lake region of Ontario, exerted a similar influence on the outcome of the recently completed decommissioning process.

Uranium mining companies in Saskatchewan devote significant effort to environmental protection in all phases of the operations. All tailings are disposed of in engineered, mined-out open pits to minimize long-term environmental impacts. Ongoing programs and incentives that facilitate the training and employment of local residents in the mines and mills and that promote local business development have been formally recognized by national aboriginal organizations that consider uranium mining companies to be pioneers in such activities. Community trust and involvement is promoted by environmental quality committees staffed by local residents.

Environment reviews of proposed uranium mine developments include decommissioning plans. All currently operating facilities are required topost financial guarantees for the full cost of the decommissioning prior to receiving a licence to operate. Recently decommissioned uranium mining facilities in Elliot Lake Ontario, the centre of uranium mining in Canada for over four decades, demonstrate that large volumes of potentially acid mine generating and mildly radioactive waste rock can be successfully contained and treated in a cost effective fashion.

Key words: *uranium, mining, tailings, acid mine waste, radioactive waste, environmental assessment, sustainable development, community involvement, training and employment*

ENVIRONMENT AGENCY GOOD PRACTICE GUIDELINES FOR STRATEGIC ENVIRONMENTAL ASSESSMENT

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The Strategic Environmental Assessment (SEA) Directive comes into force in the UK in July 2004. It aims to provide for a high level of environmental protection and to integrate environmental considerations into the preparation and adoption of certain plans and programmes programmes with a view to promoting sustainable development. The Environment Agency (the 'Agency') is the most important environmental advisor and regulator in England and Wales and will be a statutory consultee in the SEA process.

The Directive presents major opportunities and challenges that have prompted the Agency to prepare generic web based good practice guidelines. The guidelines are aimed at external plan and programme makers including public authorities and industry, their consultants and other stakeholders in the SEA process. The guidelines will set out the Agency's role, promote good practice approaches, promote links with Agency water management planning and complement other SEA guidance.

The guidelines are being developed using a staged process involving a high level of engagement with Agency and external stakeholders including representatives from national, regional and local government, industry, professional institutes, statutory agencies and non statutory organisations.

This paper discusses the development of the guidelines and in particular how the stakeholder engagement has facilitated their preparation.

Key words: *strategic environmental assessment directive, good practice guidelines, environment agency, sustainability*

NORTHERN WOOD PRESERVERS SITE SEDIMENT REMEDIATION: EA FOLLOW-UP PROGRAM

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The Northern Wood Preservers site, at Thunder Bay Harbour on Lake Superior, was recognized as a priority toxic sediment hotspot requiring remedial action on the Canadian Great Lakes. The sediments contained elevated levels of PAHs and low levels of dioxins and furans, some at levels acutely lethal to fish, degrading water and sediment quality and benthic community structure.

Following several years of investigation into remedial approaches, a partnership was formed in 1996 between government and industry to carry out a sediment remediation project. The partners included Environment Canada, Ontario Ministry of Environment, Abitibi-Consolidated Inc., Canadian National Railway Company and Northern Wood Preservers Inc. (NWPI). The remediation project involved: construction of a bermed containment area surrounding the NWPI pier and area of highest contaminated sediments which was later infilled and capped; installation of groundwater isolation barrier adjacent to the NWPI pier; dredging of all acutely toxic sediments; operation of on-site treatment facility for toxic sediments; and creation of new aquatic and terrestrial habitats nearby.

The project was subject to a comprehensive study under the Canadian Environmental Assessment Act. The responsible authorities were Environment Canada due to funding and Fisheries & Oceans Canada due to regulatory approvals. The comprehensive study was completed in mid-1997, project implementation began thereafter and was completed in 2003.

A condition of the federal Environment Minister's decision on the comprehensive study was to design and implement a follow-up program to determine the effectiveness of mitigation measures undertaken and verify the accuracy of the EA predictions. The follow-up program developed by the Ras included monitoring of: surface water quality during construction; groundwater post-construction; the newly created aquatic and terrestrial habitats; noise and odours; health and safety compliance; cumulative effects; and monitoring for any malfunctions or accidents. This paper will discuss the purpose, design and implementation of the follow-up program, report on the results, and discuss how they affected changes to the project implementation.

Key words: *follow-up, Canadian Environmental Assessment Act, sediment remediation, Great Lakes, Northern Wood Preservers, Thunder Bay, Ontario, Canada*

COMPARATIVE ANALYSIS OF IMPACTS OF TWO FORMS OF LOCAL OWNERSHIP

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This paper evaluates the extent to which anticipated societal benefits accompany local ownership. Locally owned mills and locally controlled forest tenure offer a corporate alternative, and a way for local people to have greater participation in forest management and ostensibly an opportunity to gain greater economic, social, and ecological benefits from the forest. In this paper we present an in-depth analysis of the social impacts of two forms of local ownership, one located in Meadow Lake, Saskatchewan and the other in Revelstoke, British Columbia. The Meadow Lake case involves local ownership of a forest product mill, and in the Revelstoke case, a community partnership obtained a long-term tree license for timber near their community. Using these two cases, we investigate how local ownership of a forest products mill (ownership as exclusive dominion) compares with local control over forest tenure (ownership as a bundle

of rights) in terms of socio-ecological, socio-economic and social benefits to community members. The findings suggest that socio-ecological and social benefits do not necessarily follow after local ownership is obtained. In addition, different types of local ownership yield similar socio-economic benefits but not necessarily similar socio-ecological or social benefits, which suggests different types of local ownership may result in different societal benefits.

Key words: *local ownership, ex-post social impact assessment, forest community, community corporation*

STRATEGIC ENVIRONMENTAL ASSESSMENT OF OIL AND GAS EXPLORATION ACTIVITIES IN THE NEWFOUNDLAND AND LABRADOR OFFSHORE AREA

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The Canada-Newfoundland Offshore Petroleum Board (C-NOPB) is the federal-provincial authority that regulates petroleum exploration and production activities offshore Newfoundland and Labrador. Recently, the C-NOPB has undertaken strategic environmental assessment of offshore oil and gas exploration activities in support of its rights issuance process. Under this Process, the C-NOPB offers parcels of land in the offshore area for bid to interested parties at the Call for Bids stage. Parties successful in the Call for bids, are issued exploration licences by the C-NOPB. An exploration licence grants the interest holders the exclusive right to explore for petroleum resources on that licence. Strategic Environmental Assessment at the Rights Issuance Stage enables the Board to better understand the environmental issues and concerns that may exist in the area, and use this information in determining whether to issue lands or place restrictions on activities. To date, SEAs undertaken by the Board have focussed on oil and gas exploration and seismic activities. This paper will provide an overview of the Board's regulatory structure and describe the SEA process undertaken by the Board. Two recently completed SEAs for offshore oil gas exploration activities will be described. Impacts on decision making by the Board will be highlighted. In addition, the lessons learned from conducting each SEA will be addressed.

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

ENVIRONMENTAL ASSESSMENT INSTITUTIONAL CAPACITY BUILDING IN INFRASTRUCTURE PROJECTS PUBLIC POLICY TO STIMULATE PRIVATE INVESTMENT: REVIEW OF GOOD IMPLEMENTATION CASES

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Environmental Assessment Institutional Capacity Building in Infrastructure Projects Public Policy to Stimulate Private Investment Review of Good Implementation Cases
Infrastructure projects in the World Bank portfolio have in several instances targeted capacity building or enhancement in environmental assessment and management (EA&M) institution building. In that process, the national policy makers and the implementers of the Bank gained experience in building transparent, effective and sustainable institutions. This study aims to review the experiences gained so far and make the information available for the next round of EA&M capacity building efforts in the sector. Evidence shows that Foreign Direct Investors value the existence of a reliable, robust and predictable national EA&M institution operating in a transparent way. A concentrated review was completed among all World Bank infrastructure projects that have an EPI (environmental policy and institutions) component and were activated after 1992. A brief survey was conducted among the task managers of these projects. The survey was used to retrieve brief and concise information about the outcomes of each project in terms of institutional building and support for EA&M. The survey served as the fastest way of identifying good practices and getting specifics on these practices. An important part of the study is to document the policy and implementation improvements in EA capacity of the line ministries and agencies by analyzing the results of the projects over time. The outcome of this global review depicts how and at what level the World Bank infrastructure projects assist in environmental assessment institutional capacity building.

Key words: *improved environmental regulations, environmental assessment, institutional capacity building*

INCORPORATION OF ADAPTATION TO CLIMATE CHANGE INTO THE EIA PROCESS: APPLICATION OF A PRACTITIONER'S GUIDE IN THE DEVELOPED AND DEVELOPING WORLD

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A guide to incorporate adaptation to climate change into the EIA process will be described, along with its application to the developed and developing world.

The Guide was developed by members of ClimAdapt, a network of private sector, government and NGOs in Nova Scotia, Canada. The 25-page guide provides an understanding of the implications of climate change in relation to the preparation of an EIA; direction on determining on a project-specific basis whether climate change needs to be considered; sources of information for use in assessing climate change implications, and guidance in incorporating climate change considerations into the EIA process.

The Canadian Environmental Assessment Agency funded a study to apply these guidelines to six case studies using past EIAs from major projects across Canada. Objectives of this study included testing the process and procedures on existing environmental assessments; evaluating the effectiveness of guidance provided on climate change model predictions; and evaluating whether the Guide can be used as a generic framework capable of adaptation to other environmental assessment processes.

This experience is then theoretically applied to the developing world based on analysis of climate change issues by the World Bank. The interest from the World Bank stems from recognition that climate change is happening and will increasingly affect the poor, and that adaptation in developing countries is necessary. There is thus a need to integrate responses to climate change and adaptation measures into strategies for poverty reduction to ensure sustainable development. The authors will report on the first efforts to apply the guide to the Strategic Environmental Assessment process and how it could influence funding programs at the Bank.

Key words: *EIA, climate change, SEA, adaptation, sustainable development, developing countries*

APPLYING A REGIONAL STRATEGIC ENVIRONMENTAL ASSESSMENT APPROACH TO THE MANAGEMENT OF OFFSHORE OIL AND GAS DEVELOPMENT

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Strategic environmental assessment (EA) involves the evaluation of potential environmental effects of a policy, plan, or program. A strategic EA may be applied to assess the potential outcomes of a policy, plan, or program in a defined geographical area or for a specific industrial sector. Strategic EA is normally undertaken earlier in the overall planning of resource management than project-specific assessment, and therefore offers key benefits that may improve the quality of resource management generally and project-specific environmental assessment in particular. These benefits may include broader stakeholder engagement, earlier identification of sensitive areas, establishment of development or impact thresholds, and streamlining of project-specific EA and regulatory processes, among other potential benefits. This paper will review current practice in regional strategic EA in Canada and internationally, and explore how regional strategic EA may be applied to improve the management of offshore oil and gas development.

Key words: *regional strategic environmental assessment, oil and gas development, streamlining EA process*

ON THE MONETARY VALUATION OF TRANSPORT RELATED ENVIRONMENTAL IMPACTS WITHIN A STRATEGIC LEVEL OF ASSESSMENT

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The Manual on Strategic Environmental Assessment of Transport Infrastructure Plans commissioned by the European Commission refers that different transport

alternatives may be evaluated using the monetary valuation of some of the impacts, by means of an extended cost-benefit analysis framework. This paper is drawn from recent experiences in Portugal in evaluating the costs and benefits of alternative transportation infrastructures and the inclusion of the monetary valuation of some of their environmental impacts. Whereas this appraisal procedure aims to promote sustainability in the transport sector, it also stimulates a more integrated impact assessment and the awareness of decision makers to relevant environmental costs (to avoid) and environmental benefits (to take). Considering the country context and practice, further improvements towards a more comprehensive (and effective) strategic environmental assessment of transport infrastructures can be outlined. The emerging focus on environmental valuation is discussed.

Key words*: strategic environmental assessment, transportation, valuation of environmental impacts*

ADAPTING IMPACT ASSESSMENT TO THE NATURE OF THE DECISION PROCESS

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Why do impact assessment reports often seem to be of limited influence on the project authorisation decisions for which they are produced? In this paper I argue that one of the most important impediments to impact assessment effectiveness is the gap between the impact assessment process and the decision-making process. Too often the impact assessment report is regarded as the final, stand-alone product of impact assessment. However, the decision processes that the impact assessment reports feed into can vary in nature, certainly between jurisdictions, but even within them, and the information needs differ accordingly. Consequently, if the impact assessment information is not carefully tailored to the specific decision-process it informs, it will have less impact on the decision.

In this paper I argue for an analysis of the decision processes that impact assessment reports feed into, both at the level of the impact assessment system and at the more detailed level of each IA-based project authorisation decision. Drawing decision theory from other disciplines into the field of impact assessment, something repeatedly called for in recent impact assessment literature, can help to clarify the distinctions between different IA-based decision processes, and identify the information needs of each.

On the basis of experience with a range of impact assessment case-studies in New Zealand, I illustrate how different types of decision processes lead to different information needs, and a corresponding differentiation in impact assessment requirements.

Key words: *EIA effectiveness, decision-making, decision theory, New Zealand*

CULTURAL CUMULATIVE IMPACT ASSESSMENT IN CANADA'S FAR NORTH

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Cumulative Impact Assessment is now a standard part of many Environmental Impact Assessment (EIA) processes in Canada and elsewhere. Similarly, the definition of the term "environment" in EIA has broadened progressively since the 1970s, to include, in many instances, socio-economic and cultural considerations. This case study examines a unique EIA which dealt with the combination of these: the assessment of cumulative cultural impacts of four proposed projects, in combination with other past, present and reasonably foreseeable developments.

This EIA was conducted by the Mackenzie Valley Environmental Impact Review Board (MVEIRB), an administrative tribunal in Canada's Northwest Territories. In June of 2003, four separate diamond exploration project were referred to for EIA. Although all four developments were relatively small in scale, and used known technologies, the setting for the projects was an unprotected area of great cultural significance to local Aboriginal groups, containing mass graves and spiritual sites.

Particularly challenging considerations in this EIA included:

- the identification for reasonably foreseeable future projects in mineral exploration
- baseline information issues related to cultural factors in the project area
- the commissioning of an independent regional study by the MVEIRB, as a resource for both proponents and reviewers
- the field compilation of original Traditional Knowledge by Aboriginal parties to the EIA
- mitigation techniques for the minimization and avoidance of cumulative impacts to culture and cultural sites.

Approaches to each of these are described, and are likely applicable to other EIAs.

HOW HAS SEA AFFECTED CANADIAN AGRICULTURAL POLICIES?

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The presentation summarizes the effect of SEA on Canadian farm policy since requirements for SEA were implemented in the early 1990s. Until the 1980s, there was little analysis of the environmental impacts of agricultural programs. Some programs have unintended negative consequences. For example, the LIFT (Lower Inventories for Tomorrow) program in the early 1970s led to a large increase in summerfallow, a practice that raises erosion and lowers habitat value. In 1990, the Canadian government instituted two measures requiring SEA of agricultural policies. (The Farm Income Protection Act, and the Cabinet directive on environmental assessment) At the same time, analytic tools and indicators of environmental impacts were being developed for the farm sector. Since 1990, Canada has instituted major changes in its farm policies: Commodity supports and input subsidies have been replaced by de-coupled programs that stabilize income irrespective of input and output choices. SEAs have been conducted on these policy changes, analyzing the impacts of farm policies on erosion, water quality, wildlife habitat and greenhouse gas emissions. In most cases, SEAs found that reforms would have positive environmental impacts, such as lower erosion and GHG emission levels. The SEA results have facilitated policy reform by reducing uncertainties among stakeholders and the public about possible negative impacts. Knowledge and confidence in environmental analysis is growing, increasing the potential influence of SEA in the future. There is always pressure for short-term program responses to farm income problems. Recently, there has not been a conflict between the environmental and non-environmental objectives of policy responses. Thorough environmental analysis will continue to be needed to ensure that damaging policies are not implemented in the future.

Key words: *SEA, agriculture*

EIA MADE IN THE NORTH

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The adaptation of EIA process to suit regional interests and cultures has led to a variety of approaches to EIA worldwide. A particularly interesting example of this is the Mackenzie Valley Resource Management Act (MVRMA), which provides a unique regulatory and impact assessment regime in the Mackenzie Valley in Canada's North. Based on land claim agreements between Aboriginal groups and the Canadian government, it creates an integrated system for resource management. Key features include Aboriginal co-management and decision making by quasi-judicial boards. EIA under the MVRMA has an unusually broad definition of impact of the environment, to include direct impacts on social, cultural, and heritage resources as well as on wildlife harvesting.

The Mackenzie Valley Environmental Impact Review Board — as the main instrument for Environmental Assessment and Environmental Impact Review - has now had four years of this experience with this "made in the north" EIA process. Key elements of the MVRMA are described, using case studies to show how the Mackenzie Valley Environmental Impact Review Board is implementing these key elements in EIA practice. The presentation will also highlight some of the more interesting differences between the MVRMA approach to EIA and the approach of the Canadian Environmental Assessment Act, which applies to the rest of Canada.

MANAGEMENT OF REGULATORY INDICATORS AND ITS IMPACT OVER INDUSTRIAL SECTOR IN MICHOACÁN STATE - MÉXICO

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In SUMA's Department of Environmental Protection, development indicators with the main purpose of assessing industrial and social impacts due to the reduction of stages within the process have been developed, including Authorizations and Licenses Expedition, specialized education of the technical staff, and the systematization of process. During 2003 the number of requests increased 85% over the previous year, and 110% over the last three years. 220 authorizations and 46 LAUs were sent. 45 technical modifications to the resolutions and 45 modifications to the regulation of the Law of Ecological Protection of Michoacan´s State in matters of impact assessment and environmental risk were presented. The numbers of community complaints were reduced 60% and the efficiency percentage to attend several demands was reduced by 80%. We obtained roughly 3000 data from industrial processes which will be included in the National Report of RETC, under commitments of collaboration by the network.

Key words: *regulatory topics, retc*

PRACTICAL PROACTIVE ENVIRONMENTAL IMPACT ASSESSMENT

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Infrastructure Canada Alberta Program (ICAP) goal is to improve the quality of life of all Albertans and build the foundation for sustained long-term economic growth in the 21st century. Over 508 million dollars will be invested by the federal, provincial, and municipal government through ICAP in municipal infrastructure over the next five years. ICAP's first priority is "green " municipal infrastructure. This program focus is on projects related to water and wastewater systems, water management, solid waste management and recycling, and capital expenditures to improve or retrofit the energy efficiency of buildings and facilities owned by the municipalities. Secondary priorities include local transportation, cultural and recreational facilities, infrastructure supporting tourism, telecommunications, high speed Internet access for public institutions, and affordable housing. Applications for projects within the City of Calgary that meet the criteria of ICAP funding are submitted with an Environmental Assessment when required by the Canadian Environmental Assessment Act (CEAA). The environmental assessment information addresses potential environmental impacts that may result from the project's construction and operation and outlines mitigative measures and best practices to minimize these impacts. Upon project commencement, a program to monitoring the mitigation measures required in the EA approval is implemented and followed during the life of the project. Customized inspection checklists are developed for each project, which include the above-mentioned mitigative measures in addition to items addressing municipal bylaws. Inspections include fuel management, spill procedure and policy, erosion and sediment control, emergency response training, hazardous materials handling and recycling. Monitoring data is documented through digital photography, spreadsheets and correspondence with project managers, contractors and subcontractors. The City of Calgary has enhanced the monitoring program with development of corrective actions that address common project issues.

Key words: *ICAP, CEAA, mitigation measures*

CULTURAL HERITAGE? WHEN EIA IS GOOD BUSINESS

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The cultural heritage component of EIA presents an opportunity for private sector project proponents to enhance their projects, improve their relationship with governments and communities, and burnish their corporate image.

Cultural heritage may be valued not only by government authorities, but also by NGOs, religious bodies, local communities, scholars and tourists. Thus the identification, through EIA, of cultural heritage which is potentially affected by a project, provides opportunities not only to avoid harm, but also to do good, often at little cost. Integrating into mitigating measures such activities as enhancing the condition of cultural sites and artifacts or improving access to them, can expedite a project and win friends at all levels of society. In some cases, significant cultural treasures may come to light during project implementation, providing excellent public relations material and tangible evidence of corporate social responsibility.

The authors present results of research based on a number of case studies, demonstrating a variety of unexpected benefits derived by project proponents through the cultural heritage component. They also present guidance for project proponents and EIA practitioners in addressing this often neglected aspect of EIA.

Key words: *cultural heritage, EIA, corporate social responsibility, corporate relations with governments and communities*

THE IMPACTS OF HUMAN ACTIVITIES ON THE URBAN ATMOSPHERIC ENVIRONMENT

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Land-use patterns have rapidly changed since 1980s in accordance with urbanization in Seoul Metropolitan Region, South Korea. As a result local climate has undergone dramatic change as well, and has confronted with serious environmental problems in various aspects. This study intends to define the land-use changes, and then to show how they have brought about significant changes in local climate.

Satellite data (Landsat_5) for land-use patterns, NOAA AVHRR thermal data for temperature fields and various documents were analyzed to detect the changes of urban environment. Because the urban environment has changed so rapidly that up-to date maps and documents are not available at present, and meteorological station network in city areas are too meager to understand the characteristics of urban climate. Noticeable impacts of urbanization on the atmospheric environment were identified in the study area. The results of the analysis demonstrate that Green Space in the study area decreased from 94% to 62% while urban land-use increased ten times, from 4% to 39% for the period of 1972-1992. The resulting disappearance of biomass caused by urbanization may have implications for local climate. The results also demonstrate that urban climate became dr! ier and warmer due to man-made environment, and the dimension and intensity of changes are controlled not only by natural process but also by the policy and legislation. In this sense, the climatic aspect must be taken into consideration in the process of EIA to mitigate the well-known climatic alterations of urbanization and to improve energy efficiency. The role of EIA in planning and policy processes should be emphasized to reduce adverse influences regarding the ecological, economical and social aspects before any decisions are made in the projects.

Key words: *atmospheric environment, land-use patterns, adverse influence, man-made environment*

DESIGNING SEA TO FIT DECISION-MAKING

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The "one size fits all" has often been argued has not being suitable for SEA! Yet the formal adoption of SEA, particularly where legal implementation takes place, is recurrent in following a standard format for multiple applications.

Possible explanations for this fact may be related to a) the dominant inheritance after environmental impact assessment in relation to planning and policy-making in designing SEA methodological approaches b) the leadership of the environmental administration in the promotion and implementation of SEA with little or no ownership by sectoral decision-making.

The debate often stands between the need to rationalise this tool and make it easy to apply, and perhaps mainly to control, and on the other hand the need for assuring flexibility to suit the "capriciousness and dynamism" of decision-making. Examples multiply around situations where the moment that the information is needed, and can make a difference, has long gone before the same information becomes available! Which may certainly be much more complete and technically robust, but then too late to influence decision! At its best it may achieve minimization of consequences of options that have already been closed.

A brief review of the business literature tackling strategic decision-making show multiple parallels with "la raison d'être" of SEA. The process is there, the context too, it is more a question of substance, of issues that need to be brought into the "decision basket" as equally relevant factors for decision-making.

The proposed presentation will address the experience of designing three different SEA approaches, in quite different contexts (national, sectoral and multi-national) whereby it is conceptually quite feasible yet the paradigm of traditional EIA persists, offering strong resistance to innovation in making impact assessment differently, and perhaps more effectively. The reasons will be brought up for discussion.

Key words: *SEA, strategic impact assessment, decision-making*

SEA FOLLOW-UP—WHICH WAY?

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The notion of follow-up to a decision leads us to think about "what comes after" that decision. Normally we think about projects and the consequence is straightforward: the follow-up is project implementation (at a minimum construction and operation).

But what is implementation in SEA? SEA does not lead to construction, not immediately. In fact, talking about SEA requires an immediate definition of scale is it programme, is it plan, or policy? These are different levels of decision-making that imply different rationale the details are different, the products are different and consequently also the meaning of implementation.

When attempting to address the follow-up to SEA the problem becomes quite complex, at a minimum for two main reasons:

1) the follow-up to SEA does not necessarily mean observing the decision level immediately after, it may be the decision level immediately before, or even the same decision level. In other words, the follow-up to a plan SEA

may be traced in the preparation and implementation of a policy, in another plan or even in an existing situation! 2) The follow-up to SEA must confirm that whatever is being implemented is the same that was approved, or its modification! And sometimes these modifications are hard to follow, not to mention the follow-up in the way we have learned with project's EIA. In the limit, a policy or a plan may be approved but never implemented, and yet that becomes so important to follow-up!

Increasingly SEA approaches are concerned with defining follow-up mechanisms, mostly based on indicators that apply subsequently. How does that information enters back into the decision-making process and how effective these mechanisms can be are amongst the issues that can animate debate around this presentation.

Key words: *SEA, follow-up, decision-making, impact assessment*

AFTER THE PROJECT APPROVAL-HOW TO INVOLVE YOUR COMMUNITY, STAKEHOLDERS AND THE PUBLIC

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Formal public consultation is standard practice for almost all large environmental impact assessments. Most environmental impact assessment regulations and guidance material provides detailed descriptions of when and how to inform the public of a project and engage stakeholders in advance of the decision making. Much less attention has been given to involving the public during project implementation and follow-up. This paper recommends that community involvement should not stop when a project is approved rather move to the next phase. The approach and methods used to successfully engage the public during expansion of the Vancouver International Airport is outlined in the paper. Recent expansion of the Vancouver International Airport included construction of a new terminal and a highly controversial new runway. A comprehensive environmental impact assessment was conducted for the project and resulted in a series of mitigation requirements. The Vancouver International Airport Authority developed a comprehensive follow-up program that included ongoing public involvement and consultation. Stakeholder working groups, monitoring committees, public open houses, community mail outs and annual reports have all been utilized as part of the follow-up program. Two key stakeholder committees created for the project are still active today, twelve years after project approval and eight years after completion of construction.

Key words: *community engagement, impact assessment, follow-up, airport expansion*

THE VALUE OF EARLY SOCIAL ASSESSMENT IN MINING

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Social and environmental impact assessment has historically taken place in the mining industry at the point in time when a mining company is able to define a financially feasible project. As few projects actually make it to feasibility studies, and exploration activities can last from a few to 10 or more years, this is late in the process for effectively addressing social issues, especially when trying to support sustainable development goals in which early planning, community capacity building, and avoidance of impacts rather than their mitigation are important tools. The paper will discuss several examples of mining projects in which the absence or weakness of early social assessment led to significant problems being faced by the project proponent or the neighboring communities. Several case studies will also be discussed, briefly, highlighting the way that early social assessment, particularly thorough baseline research and community profiling of social networks, interest groups, and socio-economic power relations, allowed for effective management of social impacts and enhancement of the community benefits deriving from the project. Examples will be drawn principally from developing countries with indigenous as well as poverty issues.

Key words: *early assessment, social, mining, sustainable development*

MONITORING OF THE SOCIAL AND ENVIRONMENTAL IMPACTS OF THE RAGLAN NICKEL MINE PROJECT IN NORTHERN QUEBEC (NUNAVIK), CANADA

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Through monitoring, the pertinency and relevancy of impacts and mitigation measures, identified by an EIS at the pre-project phase, can be assessed and evaluated. And , in turn, with a better understanding of impacts associated with development projects, EIS can become more efficient tools in identifying impacts of projects.

Falconbridge's Raglan Nickel Mine Project in Northern Quebec (Nunavik), Canada, has been in operation since 1998. After 5 years of monitoring the impacts on the environment and on the Inuit communities, it is possible to assess the projects impacts and remedial measures as defined in the EIS conducted in the early 90's.

We will see that most of the impacts defined in the EIS were of concerns. However, in practice the intensity and the degree of importance were quite often different and, more important, impacts not identified in the EIS have retained our attention and proper remedial measures have to be identify and implemented.

Key words: *monitoring, Raglan Project*

STRATEGIC ASSESSMENT OF DEEPWATER OIL AND GAS DEVELOPMENT IN NIGERIA

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This paper is submitted in support of the IAIA 2004 conference theme of private sector involvement in the application and advancement of impact assessment.

The concept of "strategic assessment" encompasses two major axes of the field of impact assessment: "comprehensive and integrated" and "proactive and creative." It spans multi- and cross-sectoral concerns among market, government, and civil society interests with a view to the formulation, implementation, and management of development policies and plans, such as privatization and deregulation, and their potential impacts, e.g., on equity and sustainability.

Because of the strategic nature of the petroleum resource, the scope of assessment necessarily extends to a wide consideration of issues and options across the full range of assessment scales, from local to global.

Part of the analytic problem then is to engage and manage this order of social complexity. An analytic framework for industry impact assessment is applied to Nigerian and comparative cases (West Africa, Gulf of Mexico, South Atlantic, and North Sea) to gauge the feasibility and effectiveness of this approach.

The specific objectives of the study are: (1) to estimate the existing conditions of deepwater Nigerian oil and gas development; (2) to project future conditions assuming the continuation of present trends; and (3) to evaluate alternative policies whose implementation might produce "desirable" alternative futures from the standpoint of the parties at interest and risk-local, national, and international.

Correspondingly, the scope of strategic assessment necessarily involves multiple publics, purposes, perspectives, and methods. It represents a further expansion of assessment scale to the proportions of entire industries and countries.

This is an ambitious model. As a strategy for field development in impact assessment, strategic assessment poses both problems of analytic complexity and possibilities for meaningful participation by professional colleagues, including members of IAIA-Nigeria, in anticipating and shaping impact trends and events.

Key words: *strategic assessment, petroleum development, Nigeria*

REGULATION OF OIL AND GAS EXPLORATION AND DEVELOPMENT ON THE EAST COAST OF CANADA: EARLY OBSERVATIONS ON THE CNSOPB BECOMING A FULL-FLEDGED CEAA AGENCY

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The Canada-Nova Scotia Offshore Petroleum Board ("CNSOPB," the "Board") is a joint federal/provincial agency responsible for regulation of petroleum affairs and safe practices offshore Nova Scotia.

In late August of 2003, the Board became an official Federal Authority ("FA") under the Canadian Environmental Assessment Act ("CEAA"). As such, it becomes the lead Responsible Authority ("RA") for the environmental assessment process of most exploration and development projects involving oil and gas off Nova Scotia. Other Federal Authorities include: Fisheries and Oceans Canada (DFO) and Environment Canada. The Environmental Impact Assessment ("EIA") requirements prior to the CNSOPB becoming a FA and after are reviewed and compared in terms of documentation, approval process, timelines and overall efficiency. An additional scoping step has been added to the review process. Overall efficiency of the process is discussed; as is the impact of the scoping step which has the potential to improve focus on Valued Ecosystem Components ("VECs") and pathways, allowing the EIA to concentrate on potential significant impacts, while maintaining a thorough review process. At the same time, more operations fall under the EIA process and Comprehensive Study Reports ("CSRs") may be required for more projects. One positive element is the creation of a public registry that allows tracking of the review process. A downside is a potential increase in the time required in the review process. This paper will review the early observations on the change from the viewpoint of the consulting and oil and gas industries.

Key Words: *oil, gas, offshore, regulation, CEAA, federal authority, EIA process, efficiency, public registry*

TRENDS IN THE ENVIRONMENTAL IMPACT ON THE HEALTH BURDEN IN THE NETHERLANDS: 1980, 2000 AND 2020

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The Centre for Environmental Health Research, part of the National Institute for Public Health and the Environment in the Netherlands, has done research on environment related health burden in the Netherlands over time. This research was done within the framework of the Environmental Balance, a book which is yearly published and describes trends in the Dutch environment and the effectiveness of the policies pursued. For the years 1980, 2000 and 2020, the health impact of several environmental factors has been studied, namely air pollution (PM10 and ozone), radiation (UV and radon), dampness, traffic and noise. For these environmental factors, Disability Adjusted Life Years (DALYs) were calculated. The DALY is the only quantitative indicator of burden of disease that reflects the total amount of healthy life lost, whether from premature mortality or from some degree of disability. Therefore, each health state has been attributed a weight factor (ranging from 0 for completely healthy and 1 for death). Several health states have been investigated, ranging from cardiovascular morbidity or mortality related to PM10 exposure, to sleep disturbance and annoyance caused by noise. At the time of writing, only preliminary results were available. These results indicate that traffic was the biggest cause of environmental related health burden in 1980, but this burden is declining and in 2020, health impact of noise will be the main cause of environmental DALYs. Furthermore, the health burden of ozone is increasing over the years, whereas the health impacts of PM10 and dampness are decreasing. The results of this research can be used by policy makers to reflect on policy measures taken in previous years, and to anticipate on the projected future changes. However, DALY's contain many uncertainties and should only be interpreted as a crude estimation of reality.

Key words: *HIA, environment, DALYs, trends*

WEIGHING THE CONSEQUENCES: ENGAGING BRITISH COLUMBIA COMMUNITIES IN OFFSHORE PETROLEUM ASSESSMENT

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Community impact assessment is a now well-established field from which many lessons can be learned by those about to embark in an assessment process. Considerable experience around the world can also be drawn upon regarding community impacts of offshore petroleum development. ! Despite these information and experiential advantages the question of whether or not to lift a long-established moratorium on offshore oil and gas development in British Columbia, Canada remains highly controversial. Questions of ecological and coastal community impact are at the center of the provincial debate. This paper will review and critique steps taken to date to explore questions of community impact in BC and to involve relevant communities in the process. The story of BC's offshore oil and gas debate demonstrates many lessons of its own. A range of tools has been employed with varying success to engage communities in the debate. Weaknesses in existing offshore petroleum information and information availability have been highlighted, along with the pitfalls of engaging in such a debate without a strategic, participatory approach to information management. Finally, the offshore petroleum debate in BC emphasizes the importance of co! ntext and both the strengths and limitations of comparative analysis.

Key words: *offshore petroleum, community impact assessment, community participation*

ENVIRONMENTAL ASSESSMENT INFORMATION PORTAL FOR SOUTH-WESTERN ALBERTA

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Industry, including forestry and the oil and gas sector, agencies and private consultants all require biological and geographica1 information when conducting an environmental assessment (EA). This information is often scattered, difficult to find, resulting in an inefficient process with duplication of efforts. Miistakis has developed an on-line interactive Geographic Information System (GIS) tool to aid in the EA process. This tool links remote biodiversity databases to an on-line GIS environment allowing users to compile species occurrence data with relevant spatial data (i.e., jurisdictional information, transportation networks, hydrology, vegetation).In addition, this tool is linked to a database that houses reference material including past EAs, policy documents, monitoring reports and other related materials. Users are able to define an area of interest onscreen which results in a display of all related materials. This, in combination with species occurrence data effectively assists in the environmental assessment process, allowing fast and easy access to critical information. The system is being developed in close consultation with the provincial, federal and corporate EA community. The pilot portal focuses on the Rocky Mountains with a particular emphasis on the Eastern Front of Alberta. The environmental assessment information portal consists of three key elements: 1) Basic geospatial data 2) Biophysical data 3) EA information sources (primarily grey literature) This tool enhances the EA process by producing information to support decision making, ensuring accessible information on shared biological wealth to expedite the role of individuals and organizations in assessing environmental needs. This tool also reduces costs to the EA process by reducing the time required to access information, identifying monitoring reports thereby reducing redundancy of efforts and encouraging cooperation between environmental assessment practitioners, industry and agencies.

Key words: *environmental assessment, GIS, on-line, information*

THE USE OF COMPARATIVE ECOLOGICAL RISK ASSESSMENT AS AN IMPACT ASSESSMENT TOOL

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An ecological risk assessment is the scientifically based, systematic evaluation of potential risks to ecological systems from a human activity. Risk is defined as a combination of the likelihood of an event occurring and the consequences of that event. Ecological risks are further characterized in terms of the exposure of ecological systems or natural resources to a stressor, such as toxic chemicals, and the resulting ecological effects of that stressor on specified species, habitats, or other resources of concern to society. For an ecological risk to exist, two conditions must be satisfied: 1. The stressor must be hazardous, i.e., have the inherent ability to cause adverse effects; and 2. The stressor must contact or be exposed to an ecological component (e.g., a species, biotic community, habitat) for both sufficient intensity and duration to cause an adverse effect. A comparative ecological risk assessment addresses ecological risks from two alternative potential stressors in a side-by-side comparison to evaluate whether the risk from one stressor is greater than, equal to, or lesser than the risk from the other stressor. The initial step, problem formulation, defines the site characteristics and the ecological conceptual model for the study. The second step is the analysis of the two fundamental components of ecological risks: exposure and effects. The third step is risk characterization, in essence the integration of the paired exposure and effects quantifications. The analyses uses paired outputs, allowing the direct comparison of the ecological consequences of two stressors. These outputs, and their synthesis and assessment, are an effective means of visually communicating the results of the ecological risk comparisons to decision-makers, the scientific community, and stakeholders interested in the potential environment impact of human activities. Case studies will be used to illustrate the application of this analysis process.

Key words: *methods, comparative ecological risk assessment*

THE GUIDELINES PROJECT

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This paper reviews the past experience, present status, and future prospects of efforts to formulate and implement guidelines for social impact assessment (SIA).

Guideline development is a normal part of the professionalization process in any field of knowledge and practice. It is the codification and promulgation of "lessons learned" from "best practice" in the application of such knowledge representing a consensus of professional judgment among practitioners. As such, it reflects both of the condition of organized knowledge in the field and of the professional community whose members are the bearers of that knowledge.

Efforts to formulate guidelines for SIA have been underway at least since 1972, with the convening of a largely academic consultant group by the Institute for Water Resources (IWR) of the U.S. Army Corps of Engineers. The author of this paper joined the IWR staff the following year, and has continued this work ever since. He viewed professional community building as prerequisite to guideline formulation; IAIA is in part an outgrowth of that strategy.

Beginning in 1990, a concerted effort was mounted in the U.S., specifically in the context of the National Environmental Policy Act (NEPA), to increase SIA legitimacy and efficacy. In May 1994 the Interorganizational Committee on Principles and Guidelines for Social Impact Assessment. Including IAIA representatives, published "Guidelines and Principles for Social Impact Assessment" under the auspices of the National Marine Fisheries Service, U.S. Department of Commerce; it was revised in 2003.

Corporate involvement in SIA guideline formulation commenced shortly thereafter under the leadership of Murray Jones, and continues down to the present in the context of "Integrated Assessment Guidelines." Since 1998 IAIA members under the leadership of Frank Vanclay have undertaken to "internationalize" SIA guidelines; the result of that extended effort is IAIA's May 2003 statement on "Social Impact Assessment: International Principles."

Key words: *social impact assessment, guidelines*

THE CANADIAN CONNECTION

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The "connections" series began at IAIA'01 in Cartagena and continued in successive years at the Hague and Marrakech. It consists of three interconnected parts: (1) the impact history of the host country and community, (2) highlighted and, ideally, experienced in impact tours at those scales; and (3) the development and contribution of impact assessment by, in, and about those peoples and places. The idea of "connections" suggests their intersections and interactions.

IAIA and the field of impact assessment in general owe much to Canadian colleagues and institutions for their significant and sustained contributions to advancing the state of the its, science, and craft. Canadian impact assessment has been-and remains-at the forefront of our field. I have offered my appreciation of these achievements on previous occasions-special "Canadian content" issues of my occasional, erstwhile publication, Social Impact Assessment, and citations for IAIA's Rose-Hulman Award (Tom Berger and Gordon Beanlands/Peter Duinker).

On this occasion, it may be recalled that IAIA's founding meeting was held in Toronto in 1981, in conjunction with the annual meeting of the American Association for the Advancement of Science. This year's conference marks the third time IAIA has convened its annual conference in Canada-Montreal in 1989 and Quebec City in 1994 (not counting the 1998 regional conference in Calgary).

Vancouver occupies a special place in the affections of the social impact assessment (SIA) community. The first international meeting of SIA was held down the road in Richmond in 1982, though predated a year by the First Canadian Symposium on SIA held in Kananaskis, Alberta. Vancouver and British Columbia are the site of a various major events in impact history, a number of which (Burchard, Kemano, Revelstoke, Fraser River, Whistler, etc.) are documented, mapped and, again ideally, visited in the Vancouver/BC Impact Tour. Only connect.

Key words: *Canada, impact assessment, IAIA*

THE CANADIAN INDUSTRY PROGRAM FOR ENERGY CONSERVATION (CIPEC): PRESENTATION ON THE DYNAMICS OF A 28-YEAR ENERGY EFFICIENCY PARTNERSHIP

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Launched in 1975, the Canadian Industry Program for Energy Conservation (CIPEC) has been a key element of the Canadian government's industrial energy efficiency efforts. Under the auspices of Natural Resources Canada, CIPEC provides provides a focal point for a joint industry/government voluntary alliance to increase energy efficiency, limit emissions of energy-related greenhouse gas emissions and increase economic competitiveness. Key program outputs include energy efficiency improvement

targets and action plans to achieve these targets at a sector and sub-sector level. Through a network of 26 sector task forces supported by 45 related vertical trade associations, CIPEC provides Canadian industry with access to services designed to reshape and/or reduce marketplace barriers to the implementation of energy efficiency practices and programs within their respective organizations. This presentation will expand upon the above outline, highlighting how the initiative has adapted to significant energy and environmental policy changes since its inception.

Key words: *industry, energy efficiency, partnership, greenhouse gas, reduction*

STRENGTHENING BIODIVERSITY CONSERVATION THROUGH COMMUNITY ORIENTED DEVELOPMENT PROJECTS: AN ENVIRONMENTAL REVIEW OF THE INDIA ECODEVELOPMENT PROJECT

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The India Ecodevelopment Project supported from Global Environmental Facility funds has been a major conservation initiative of Government of India that was initiated in 1997 in seven Protected Areas in the country. Like most people-centered conservation and development projects, this project also aimed to strengthen biodiversity conservation by establishing critical links between conservation and community well being. The project led to appropriate interventions for improving the management of wildlife habitats and biodiversity values and community based natural resource management to reduce dependence on the Protected Areas. The objective of Environmental Review of the India Ecodevelopment Project was to evaluate inherent risks and negative impacts associated with project supported activities within the Protected Areas or at interfaces with community inhabited areas that could significantly undermine the conservation benefits of such a project. From an environmental standpoint, most project interventions positively influenced the prospects of biodiversity conservation in all the project sites. The project has also contributed significantly in improving the quality of life of communities living in and around the Protected Areas through specific inputs for improvement of agricultural productivity; livelihood opportunities; social and physical infrastructure and viable resource alternatives. Potential impacts associated with some interventions were minor and could be mitigated through simple measures that included involvement of landless beneficiaries in project activities; adoption of consensus driven reciprocal agreements for benefits sharing and encouraging community decisions; development of woodlots and plantations for protection of fuel wood and fodder species and construction of physical structures for soil and water conservation and crop protection. The India Ecodevelopment Project had proven benefits in improving conservation prospects by addressing negative impacts associated with resource use and livelihood practices but has been limited in scope to address biodiversity threats from unplanned development and incompatible landuse around Protected Areas that are far more significant threats.

Key words: *India ecodevelopment project, biodiversity conservation, resource use, livelihood impacts*

BUILDING CAPACITY FOR HEALTH IMPACT ASSESSMENT IN EUROPE

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The World Health Organization is actively promoting HIA as a resource to raise the profile of health considerations in the decision making process. As one of the means to raise awareness of the potential of HIA, we have been engaged in several activities in capacity building and training. We organized a few training sessions, mostly taking place in countries of the European Region where radical changes are underway (e.g., countries accessing the European Union or moving to market economy). The aim of these courses was to provide a general introduction to HIA, discuss applications in areas of interest for the audience, always with a strong emphasis on practical and participatory aspects.

In designing these courses, we have tended to respond to different needs as they arose from recipients. Such reactive approach has advantages and disadvantages. Addressing participants' needs and providing a contribution towards solving concrete questions is normally very well received; training sessions thus become integral part of specific HIA exercises. Participants, on the other hand, are not all in a position to always tum the training into real work, so the long term benefit, apart from some valuable awareness raising, is unclear.

Discussion is under way as to best design these courses. Demand for HIA training remains high in Europe and it is important to maximize the return of a costly activity such as capacity building when developing plans for the future. A more proactive approach based on a "core" course, to be used regardless of the local circumstances, might be beneficial.

Difficulties in striking the appropriate balance reflect the variety of ways in which HIA can be used to support the decision making process and its loosely defined methodology. However developing more capacity building using recent experience and the many lessons learnt is among WHO's priorities in
HIA.

Key words: *health impact assessment (HIA), capacity building, WHO*

URBAN PLANNING AND CO-EXISTENCE IN SWEDEN OR - WHO CAME FIRST - THE PLANT OR THE VILLAGE?

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The paper presents the problem with old cities where a once-small rural industry develops and changes its production activity into a potentially more hazardous production. This changing has, in many old cities in Europe, taken place over a long period of 150 years, since the middle of 19th century. At the same time, the residential areas around the factory have grown from simple, small village houses to larger, more heavily-exploited housing areas. The modern urban planning in Sweden of course doesn't allow such co-existence when new areas are planned, but with existing urban areas the problem is there—"who came first"!

The paper presents two examples. The first is a chemical industry, one of Europe's largest, "Akzo Nobel Surface Chemistry," producing chemicals north of Gothenburg. Important application for raising the production with 50% is under trial at the moment. The paper presents how the authorities, stakeholders, the residents as well as the NGOs meets at different arenas before and during the decision making of the production raise is taken.

The other example is a former old industry from about 1850 that over the years has changed into a modern international industry, "Eastman Chemicals," squeezed between housing areas in an old town in eastern Gothenburg. The neighbours' demands to reduce the hazardous production are getting more and more intense, and are often well exposed in media. At the same time, developers also would like to build new houses in the (maybe contradictory) attractive central area. Several impact assessments have been done.

The paper presents how impact assessments with risk analysis are integrated in the decision making process in Sweden and afterward, with international comparisons, an extensive and democratic public participation.

Key words: *sustainability, urban planning, EIA, risk analysis, public participance, decision making, co-existence*

INTEGRATING BUSINESS PROCESS AND BIODIVERSITY CONSERVATION

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The Royal/Dutch Shell group of companies (hereafter referred to as Shell or the Group) has identified biodiversity as a one of the key drivers for decision-making. In addition to legal and regulatory incentives, there are strategic, operational, reputational and financial reasons as to why Shell sees biodiversity as integral to the success of its operations. The potential for conflict is very real. Energy is essential for economic development and raising living standards. Long-terms energy scenarios indicate that global primary energy demand by 2050 could be up to three times what it is today, with a large proportion of this coming from the traditional fossil fuels oil and gas. The challenge to society in the coming years will be to ensure continued economic and social development given the increasing global human population, while at the same time maintaining the health and integrity of the world's ecosystems. We also are seeing a huge increase in the numbers of protected areas over the last few decades with over 11% of the earth's surface currently under some sort of protection. There is also a target of having 15% of the marine environment protected by 2015. Can the extraction of coal, oil and gas resources be carried out in such a way as to not negatively impact on biodiversity values, whether it falls under protection or not?

This paper highlights Shell's approach to addressing the issue of biodiversity conservation in order to face this challenge. It focuses on the three key areas that Shell has been working on: playing a role in the public policy debate with regards to protected areas, working to minimise its operational footprint, and making a positive contribution to biodiversity conservation. It presents in some detail the steps the company has taken to address the issue of protected areas and how the company is playing a role in the public policy debate. It highlights key initiatives that the company has been focusing on to integrate biodiversity into decision-making, a corner-stone of which has been the integration of biodiversity into its impact assessment process. And finally, the paper presents some of the many ways in which Shell has been making a positive contribution to biodiversity - through collaborative partnerships with renowned conservation organizations.

IMPACT OF SCHOOL CONSTRUCTION PROJECTS BY CANADIAN NGOS IN NICARAGUA

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This paper presents findings by the author while doing research on the impacts of school construction projects in Nicaragua.

There is a shortage of schools in Nicaragua. Because of this, volunteer organizations build schools there. In recent years