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**IMPACT ASSESSMENT
IN THE URBAN CONTEXT**

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The Environmental Professional's Forum
Bringing together

- *Environmental Decision-makers*
- *Industry and Community Leaders*
- *Professional Practitioners*

ABSTRACTSVOLUME

IAIA

NOTES

This volume contains the abstracts of papers and posters presented at IAIA'01, the 20th Annual Conference of the International Association for Impact Assessment.

Abstracts received by the International Headquarters and represented by one or more authors registered on or before 15 April 2001 are included.

Abstracts are arranged by alphabetical listing of primary authors. Key words and author indices are included at the end of this volume.

Abstracts have been minimally edited for style consistency, grammar, spelling, syntax, and mechanics; length in excess of 300 words was subject to deletion. Abstracts, contact information, and key words are otherwise reprinted as provided by the author(s).

The Need for Environmental Protection Legislation in the Niger Delta Region of Nigeria

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The need for bottom-top Environmental Protection Legislation in the Niger Delta Region of Nigeria cannot be over-emphasized. It is glaringly clear that we cannot liberate ourselves and rise on one hand and sink on the other.

It is therefore imperative that the oil-bearing communities no longer wallow in dissolute neglect, sheer deprivation and monumental environmental devastation through the deliberate effects of FEPA's ineptitude and the federal government's continued practice of a unitary system in the guise of a federal system. What the ecological abuse, economic disenchantment and social frustrations have brought to the region is youth restiveness, communal conflicts, and violence which the present state government in place has spent so much time, energy and resources to put out.

The way forward, therefore, is the provision for environmental protection legislation from the grassroots level as it concerns the oil industry which should be transferred from the exclusive to the current legislative list so that states, and indeed the Niger Delta people, will be empowered to make laws directed at checking further degradation of their peculiar environment, arising from the continued exploration and exploitation of oil.

This is the enshrinement in the USEPA Act of the United States of America from which the FEPA Act was extracted. The federalism of the United States from which Nigeria copied the federal system of governance is the legislative right of the Niger Delta people.
environmental degradation, national policy, true federalism, unitary system of government, national policy of environment, accomplice or watch dog, EIA report, PRA report, action/work plan, assessment for liability or compensation, sustainable development

Capacity Development and Linkages for Environmental Impact Assessment in Africa (CLEIAA) (Poster)

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The importance of Environmental Impact Assessment (EIA) was emphasised at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992. Consistent with the concept of Sustainable Development, principle 17 of the Rio Declaration endorsed the universal application of EIA as a national instrument. The participating heads of States at UNCED therefore adopted Agenda 21 and the Rio principles.

Pursuant to the above mentioned, the Africa Ministers Conference on Environment held a meeting in Durban in June 1995 (prior to IAIA'95). This was also followed up by a series of meetings by Technical Experts, culminating in the Nairobi stakeholder workshop in 1998 on "EIA Capacity Building in Africa."

In order to move the process significantly forward, a consultative meeting on Environmental Assessment Capacity Development in Africa was held on May 25th and 26th, 2000, in The Hague. The main outcome of the meeting was the organization of the Capacity Development and Linkages for EIA in Africa (CLEIAA), whose interim phase was started in October 2000.

The goal of the CLEIAA initiative is that "in 2010 all African countries have a working EIA system in place, adapted to the needs and capacities of each country."

The objectives of the interim phase are:

- A. Improve provision of information to the African countries, the donor community, and relevant national sub-regional, regional and international organisations;
- B. Harmonise EIA capacity development efforts on the African continent; and
- C. Design the long-term sustainability of the initiative and related structures.

The poster would outline activities, goals, objectives and expected outcomes of the initiative. It is intended to create awareness and inform African countries, as well as the international community of the new initiative.

capacity, development, linkages, environmental, impact, assessment, Africa

Colombia Shifts into New Planning Systems. The Integration of Environmental Assessment in the Bogota Municipal Master Plan. Case Study.

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The case study aims to establish how, through many years of structural change, Colombia has undergone a crucial process of transformation in its decision-making systems that finally allows the application of key planning instruments and different techniques in order to improve the quality, objectivity and feasibility of public policy. It focuses on the development of spatial planning and environmental legislation, establishing through the evaluation of the process of approval of the Bogota Master Plan, the existence of an early stage of integration between environmental appraisal and spatial planning instruments. It finds that existing elements could help strengthen, some of the forms of integration that would allow the introduction of formal or informal SEA procedures, into the recently implemented spatial planning processes. Finally, it puts into consideration some adjustments that could be implemented in the intermediate master plan revision, due in three years.

“Equity, Prosperity and Tranquility”: The Niger Delta Project

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The Niger Delta Project is a regional and community development project initiated by the Nigerian affiliate of the International Association for Impact Assessment (IAIA-Nigeria). Its purpose is to assist communities, governments, and industries in securing “equality, prosperity and tranquility” for the Niger Delta region of Nigeria. Although the project was launched at the annual meeting of IAIA-Nigeria held 16-18 October 2000 in Yenagoa, Bayelsa State, its roots go back to earlier efforts to relieve suffering in the region from economic deprivation and political repression under previous regimes.

In June 1999 the new government of Nigeria issued a call for expressions of interest in preparing a master plan to promote “equity, prosperity and tranquility” in the Niger Delta region. A response was submitted in August 1999 on behalf of a number of Nigerian and international colleagues. At the time, it was felt however that a “bottom up” grassroots approach was more appropriate to meeting the needs of people in the region. The master planning exercise has not progressed to date, due to delays in establishing a Niger Delta Development Commission which stem from political controversy and unrest over “resource control.”

At the Yenagoa meeting in October 2000, the public was invited to participate in exploring problems and possibilities for community and regional development. Some 750 registered; daily attendance averaged around 450. Participants heard formal presentations and formed groups based on local government areas to identify and rank community problems and propose solutions to them with and-more importantly-without external support. Following community consultations after the meeting, formal proposals were submitted to IAIA-Nigeria coordinators for review and endorsement by state government and, ultimately, by the federal government and international donors.

community development, community impact assessment, participatory development

Mangrove Revegetation in the Sustainable Environmental Management of Niger Delta Region of Nigeria (Poster)

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Dr. E.A. Akpofure’s team on mangrove revegetation operations started from early experience acquired from the first plantation development in Rivers State which apparently also became the first mangrove plantation development work in Nigeria in 1986. The initial experience guided the different methods later developed in raising *Rhizophora spp.* In the nursery, in view of the prevailing local conditions, human and pest problems associated with mangrove seedling development in the field. The various methods tried ranged from single containers for a multiple number of seedlings, the use of polybags of various sizes for single seedling production, and direct planting of propagules in the field to single chikoko block for single or multiple seedling development in the nursery. The first Pilot Study for Shell Petroleum Development Company of Nigeria Limited (SPDC) was Dr. Akpofure’s team as the first to deliver the needed possibility of raising mangrove seedlings

in a large scale. In pursuance of this effort she successfully executed the first seismic line of single row planting of 6 kms with *Rhizophora spp.* in Otokolomabia Creek near Bonny, Rivers State, Nigeria. This achievement led to her executing another seismic line planting of 560 kms at bonny West and 650 kms in Opobo Channel in 1995/96 all in Rivers State, also in 1997, she revegetated 1327 kms of seismic lines for ELF Petroleum Nigeria Limited in their OML 57 in Delta State. In 1996 she rehabilitated a dredge spoil near Soku with *Zyzigium spp.* Rehabilitation of backfield Right of Way with multiple rows of mangrove seedlings particularly with *Rhizophora racemosa* of a gas pipe line Right of Way (ROW) 29 kms by 20 m wide from Nembe in Bayelsa State to Soku in Rivers State (all in Nigeria), is the most current successful project carried out by this team. Dr. Akpofure and her team have therefore proffered possible solution to mangrove plantation development in Nigeria, in the sustainable environmental management of the Niger Delta described by experts as "an epic center of environment conflict." The method adopted will be very useful in other parts of the world where there are similar mangrove ecosystems.

forest management, environmental remediation

**The Population, Energy and Environment Program:
Lessons from a Tri-partite Dialogue**

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This program is a response from countries sharing the Amazon to the challenge of developing an oil industry compatible with the objectives of sustainable development. It is a joint initiative by OLADE (The Latin-American Energy Organization) and The World Bank, aiming at supporting governments, industry and indigenous peoples in their dialogue for developing common criteria to improve the handling of environmental and social impacts of oil operations.

At the origin, governments appointed high level officials – National Coordinators (NC) – who agreed on the need of a long-term action plan, involving key stakeholders from industry and indigenous peoples organizations. The PEA has hosted two meetings gathering the NC, company representatives, ARPEL (the regional industry association), indigenous peoples organizations and COICA (the coordinating organization of Amazon indigenous federations). As a result, it has generated a tri-partite dialogue that is paving the way for joint activities, such as:

1. National dialogues to open communications among key stakeholders
2. Development of an information network, sponsored by Corporación Andina de Fomento
3. Preparation of Reference Documents to harmonize industry regulations, funded by the Canadian Cooperation
4. A training program to improve social and environmental standards and existing dialogues, activity is executed in 5 countries, sponsored by the German CDG Foundation.

Complementarily, there are other initiatives:

1. The IDB is preparing loans to support governments wishing to engage in consultations prior to licensing exploration blocks
2. A comparison of oil rents' distribution mechanisms and the shares received by oil provinces and indigenous peoples affected by the industry

It is evident that the PEA program has facilitated an effective dialogue among the key stakeholders and thus is increasingly calling the attention of other institutions. The next tri-partite meeting will be in Cartagena (May 23-25).

indigenous peoples, oil industry, environmental and social regulations, tri-partite dialogue

**Results of the Environmental Impact Assessment
Systems Review in Latin American and Caribbean
Countries**

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Since the 80s most of Latin American and Caribbean, LAC, countries adopted the environmental impact assessment (EIA) process which was often supported by the Inter-American Development Bank (IDB) with their financing of

projects. A diversity of methodologies in the environmental analysis and different systematic expressions of the EIA process in the countries have generated a series of individualized EIA systems adjusted to the reality of each country. Growing regional integration makes it a priority to seek greater harmonization of the EIA systems, principles, and procedures on a regional basis.

After two decades of EIA in the Region, the IDB sponsored a review of the 26 EIA systems in LAC countries. This review examines the EIA system's operational aspects, its regulatory framework, and the perception of 691 experts from the public and private sectors, NGOs, consultants and academics on the effectiveness of EIA systems. It concludes by assessing requirements to strengthen EIA systems in the region.

The results show that the institutional foundations of EIA, its laws, principles and administrative procedures are reasonably well established in most of LAC countries, reflecting the fact that recent steps have been taken toward strengthening many national EIA systems.

LAC EIA systems have been successful in informing stakeholders on the important actions or projects, which will significantly affect the environment. EIA systems in the region have also helped in the application of environmental protection criteria and consideration of environmental impacts in the decision-making process. Finally, there is a recognized general acceptance on the necessity to articulate the EIA process under a unique national EIA system.

Main strengths and weaknesses are identified for the EIA systems and analyzed to draw policy recommendations to improve them in several areas, including building enabling conditions and strengthening the institutionalization and political will, the citizen participation and the administrative procedures.

environmental impact assessment systems, environmental impact assessment process, environmental impact assessment reports, Latin American countries

Integrating Spatial Planning and EIA in Ghana

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There are various actors in Environmental Assessment (EA) who also play roles in other development endeavours. There are two basis sets of laws governing development activities in

Ghana. These are: (i) *Town & Country Planning Law 1945 and Local Government Act 1993, Act 462* and (ii) the *Environmental Protection Agency Act 1994, Act 490 and the Environmental Assessment Regulations, 1999 (LI 1652)*.

The lead institutions with regulatory mandates for development in Ghana are the Town and Country Planning Department (TCPD), responsible for the former laws, and the Environmental Protection Agency (EPA), for the latter laws above.

While TCPD is decentralized to the District level, EPA is decentralized to the regional level. The District Assemblies are the planning authorities with responsibility for management of areas under their jurisdiction. The Assemblies operate through the TCPD and have established schemes and standards for land use zoning and project categorization. EIA is applied in Ghana as an improved planning tool, strangely however the planning authority has no formal mechanism for its use. EPA is responsible for the screening of undertakings for EIA though the Agency is not represented at the district level.

These are anomalies that impede the functions of the two important institutions and stifle sustainable development. This paper looks at the following possible collaborative innovations that could remove the observed bottlenecks:

1. Comprehensive understanding of EIA procedures and laws by TCPD and planning laws and procedures by EPA officials
2. Development of single screening criteria
3. Decentralization of screening to the District level
4. The TCPD of the assemblies to play a lead role in screening supported by a committee of relevant decentralized institutions and the District Environmental Management Committee
5. SEA to cover land use planning schemes
6. EPA clearance to precede all other permits
7. Joint monitoring of approved projects

spatial, integration, planning, district, assessment, development, impact, environmental, decentralization, screening, laws

Experiences in Wastewater Treatment and Disposal in the Cities of Barranquilla and Santa Marta (Colombia)

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The cities of Barranquilla (1.3 Mio. inhabitants) and Santa Marta (350,000 inhabitants) are situated in the Northern part of Colombia at the Caribbean Coast and belong to the small group of Colombian cities that possess wastewater treatment plants.

The evaluation of environmental impacts of similar projects should occur before, during and after the development of projects to ensure that they are meeting their intended objectives. Conscious of this responsibility a permanent monitoring program for the wastewater treatment plants of Barranquilla and Santa Marta was implemented. The evaluation and interpretation of the results of the monitoring program allow for preventive and corrective action to avoid or minimize impacts to receiving waters and the environment.

Wastewater treatment plant "El Pueblo," Barranquilla. The wastewater treatment facility "El Pueblo" treats wastewater from the southwestern portion of the city of Barranquilla, a population of around 350,000 inhabitants or 25% of the total population of Barranquilla. It is expected to reach its design capacity of 1.400 l/s in the year 2025, serving a population of 500,000. "El Pueblo" is based on treatment using stabilization ponds.

Benefitting from day-to-day experience and constant monitoring, evaluation and interpretation of results, the initial designs were improved for the entire treatment system.

Wastewater treatment and disposal in Santa Marta. Due to the geography of the city, its coastal location and the lack of wastewater treatment installations, Santa Marta has opted for the construction of a system consisting of a preliminary treatment and a submarine outfall. The project is currently discharging 850 l/s and is expected to reach its design capacity of 2,500 l/s in the year 2030.

This section will present the conditions in the discharge area before and after construction of the outfall.

wastewater, wastewater treatment, wastewater treatment plant, environmental impacts, monitoring program, stabilization ponds, submarine outfall, Colombia, Barranquilla, Santa Marta

Sustainability Indicators in Austria - Case Studies at Regional (Styria) and Local Level (Graz)

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Environmental policy's discussions of the last years identified the crucial importance to develop and apply not only ecological, but sustainability indicators. Such indicators are an instrument to operationalize environmental, social and economic quality goals of plans, programmes and policies (PPPs) dealing with sustainable development issues.

Such indicators can be used for a judgement, whether the PPPs have reached their objectives and if so, to what extent. Moreover, they support decision-makers to adapt and revise their PPPs, and they are momentous for monitoring measures.

This paper selects two activities in Austria dealing with sustainability programmes and parameters. Their development and application will be highlighted by presenting a regional and a local case study. One is describing the indicators of the "Provincial Environment Programme of Styria" (approved in 2000), the other those of the "Local Agenda 21 of the City of Graz" (won as the first city in Europe the "European Sustainable City Award" in 1996).

The latter one came into force five years ago; a first evaluation has been completed in March 2000. In both cases the chosen indicators measure the progress or the retrogression made in policy fields dealing, e.g., with climate protection, energy issues, water management, transport, consumption of raw materials, agriculture, forestry, waste management, and land-use planning. It is to state that those indicators are currently focusing more on ecological issues than on socio-economic ones, but that gap is becoming smaller.

sustainable development, indicators, Local Agenda 21, Austria, Styria, Graz

Gene Technology Assessment and Regulation in Australia: Recent Developments

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In December 2000 the Australian federal parliament enacted legislation for the assessment and regulation of gene technology in Australia. It does this by regulating certain dealings in relation to genetically modified organisms (GMOs), including research, manufacture, production, propagation, commercial release and import. State and Territory legislation will complement the federal legislation.

The legislation will fill gaps in existing regulatory arrangements and does not replace existing schemes for the regulation of food, therapeutic goods, human gene therapy and agricultural, veterinary and industrial chemicals. The Gene Technology Act 2000 establishes the office of Gene Technology Regulator (the "Regulator") to perform functions and exercise powers under the Act. These include the performance of risk assessments for proposed releases, the preparation of risk management plans and the issuing of licences. The Act also establishes three committees to provide scientific, ethical and policy advice respectively to the Regulator and/or the Ministerial Advisory Council.

The Act requires the Regulator to seek advice from the federal environment Minister in relation to proposed dealings involving the intentional release of a GMO into the environment. In some circumstances such dealings may also trigger the environmental assessment and approval provisions of the Environment Protection and Biodiversity Conservation Act 1999 – the principal environmental impact assessment legislation at the federal level in Australia.

The paper will outline and discuss the provisions in the new legislation for the assessment and regulation of GMOs, including consideration of criticisms of the legislation from various quarters. It will also discuss how the new scheme fits into the overall arrangements for regulating the production, use and distribution of genetically modified products in Australia.

Australia, gene technology, genetically modified organisms (GMOs), risk assessment, risk management, regulation

The Australian Regional Forest Agreement Process: a Case Study in Integrated Assessment and Decision-making

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Conflict over Australian forest resources, especially between conservation and wood production, has in recent decades been deep-seated and acrimonious, at times spilling over into physical violence. Overlaying the fundamental conflict

between conservation and wood production has been conflict between the Commonwealth (federal) and State governments arising from intervention by the Commonwealth in State forest management issues.

In an attempt to find a lasting solution to these conflicts, Commonwealth and State governments have since the mid-1990s been pursuing a regional forest agreement (RFA) process, which includes a wide-ranging program of environmental, economic, social and cultural heritage assessments known as comprehensive regional assessments (CRAs). These assessments are integrated and form part of an integrated assessment and decision-making process.

The RFA process includes the design of a comprehensive, adequate and representative reserve system, recommendations for ecologically sustainable forest management practices and identification of industry development opportunities.

The paper examines the RFA process as a case study in integrated assessment, with illustrations drawn from particular RFAs. Issues examined include the policy origins and underpinnings of the process, the CRA methodology scientific aspects of the process, public consultation trade-off mechanisms and the environmental, economic and social benefits and outcomes of the process.

Australia, strategic environmental assessment, integrated assessment, regional forest agreements, comprehensive regional assessments, forests, wood production, conservation

Psycho-morphological Overview to Impact Assessment & Crises Management (Case Study Niger Delta)

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It is evident that the psycho-socio ecological problems of the Niger Delta (Nigeria), worsened by the past hazy political scenario has a direct impact on the youths, precipitating various escalating incidents of crime, restiveness, and vandalizing attitudes closely associated with the youths most of whom are unemployed even now, because of no academic or vocational skills to market. Various levels of government-oriented impact assessment and crises management techniques have been employed which led to the employment of diverse suppressive security apparatus and diversionary crises management techniques, aimed at checking the climaxing nuggets of anti-social vices perpetuated by the youths which have continued to lead to

societal decadence. In this abstract, we believe that the most viable solution to the holistic impact assessment and crises management of the Niger Delta Region is a well articulated and implemented sustainable psycho-morphological impact assessment and crises management program. The said approach will act as: a) A base line for crises and environment management techniques in the region; b) The best approach to initiate the sustainability of the rural industrialization scheme and participatory rural appraisal report/work plan; c) A model design for the promotion of cordial relationship between the host communities, the government and guest companies; d) An unprecedented model for psycho-socio- economic and environment and community development blueprint for the grassroots development of the Niger Delta Region of Nigeria.

Niger Delta, psycho-morphological impact assessment and crises management, hypo-chrondaias, endo-morphological approach, ectomorphological approach, mesomorphological approach, ambimorphological approach

A 5-year Update of the Development of EIA Follow-up Works Internationally and the Latest Experiences and Development in Hong Kong

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This presentation would take stock of and update the development after the international review of the EIA follow-up works undertaken by the Hong Kong Environmental Protection Department in 1995 as part of the International Study on the Effectiveness of Environmental Assessment. It would also outline some key developments and experiences of the EIA follow up works in Hong Kong and the likely future directions in the 21st century.

The Integration of Sustainability Objectives into Policy Processes in South Africa

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Guidelines for Strategic Environmental Assessment (SEA) in South Africa were produced in 2000 by the CSIR, in partnership with the national Department of Environmental Affairs and Tourism (DEA&T). During the stakeholder workshops, which were held as part of the formulation process for these Guidelines, it became evident that SEA applied to the policy level of decision-making would be different to that of the plan and programme levels. This is due to the amorphous, incremental and more political nature of the policy-making process. The current SEA Guidelines only relate to the plan and programme levels of decision-making, therefore, research is being undertaken by the CSIR on applying SEA to the policy process.

The challenges facing the integration of sustainability into policy-making include: understanding the practical implications of sustainability in the South African context and within each sector in this country, and developing an approach which is not only applied by environmental specialists, but is also easily understood and used by political decision-makers and ensuring that this approach responds to the strengths and weaknesses of the South African policy environment.

Stakeholders in policy processes have indicated that a proactive approach to the integration of sustainability into policy processes is required rather than a reactive assessment after a policy has been formulated. Key questions relating to sustainability objectives, to be asked at various stages during the policy formulation process, are therefore being developed.

In this paper, a brief overview of the policy environment in South Africa and the implications for the integration of sustainability into policy processes is presented. Finally, an approach to the development a tool for the integration of sustainability objectives into policy processes is described.

strategic environmental assessment (SEA), sustainability, policy

Assessment Tools for Biodiversity Businesses: Setting the Scene

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Achieving sustainable development requires a re-think of business as usual. Businesses of today and the future are thinking increasingly of what they can do to improve the environment. A number of businesses have even adopted conservation as a core component of their mission – seeking

to benefit biodiversity while making a profit. Furthermore, recent years have witnessed the emergence of a number of conservation investment funds which are actively seeking out such businesses. But just how can these funds and the businesses they are looking for be sure that their for-profit enterprises are contributing positively to biodiversity? This paper will provide an overview of the development of a biodiversity business sector and highlight key questions relating to the assessment of the impact of such businesses.

biodiversity, business

Environmental Assessment Follow-up: A Framework for Environment Canada

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Environmental assessment follow-up (EA follow-up) is recognized as an essential component of an effective environmental assessment (EA) process. EA follow-up is a program for: ensuring the implementation of mitigation measures, determining the effectiveness of those measures, and verifying the accuracy of the EA. Despite the recognized importance of EA follow-up, it is rarely undertaken in EAs conducted in Canada. Many stakeholders in the EA process have recently voiced the need to strengthen the role of EA follow-up. The Canadian Environmental Assessment Act (CEAA) sets out the responsibilities and procedures for the EAs of projects involving the federal government. Proposed changes to CEAA are expected to strengthen the role of EA follow-up.

Environment Canada (EC) is a federal government department that has two specific obligations under CEAA. As a Responsible Authority, EC must conduct EAs for projects that it undertakes as a proponent or supports through provision of funding, lands or a specific regulatory

approval. As a Federal Authority EC must provide specialist or expert information to other federal departments and agencies who are conducting EAs. Depending upon its role EC has different responsibilities with respect to EA follow-up.

In response to the recognized weakness of EA follow-up, and in anticipation of the pending amendments to CEAA, EC has developed an EA Follow-up Framework. The framework provides direction for EC in conducting and participating in EA follow-up programs. Specifically, the Framework: establishes criteria to aid in deciding on the need for EA follow-up, establishes criteria for scoping the follow-up issues, identifies potential tools and methodologies that may assist in the design and implementation of the EA follow-up, and identifies EC's roles and responsibilities in the EA follow-up. This paper describes this framework and how it will be used by EC staff when conducting or reviewing project EAs.

environmental assessment, follow-up, mitigation, monitoring

English Regions and Sustainability: Towards the Development of a Productive Strategic Environmental Assessment System

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Central to this paper is the suggestion that planning and development frameworks in England are currently at a potentially productive, although problematic turning point. Whilst on the one hand the UK is attempting to make the institutional and procedural changes necessary to facilitate the process of regionalisation and devolution, it is at the same time facing the challenge of accommodating the need to make decision-making at different levels accountable to the over-riding objectives of sustainable development. In the light of these challenges, the authors highlight the value of strategic environmental assessment (SEA) as a mechanism for improving the environmental quality of decision-making and make recommendations as to how regional governance can benefit from the development of an SEA system which is capable of reconciling the sustainability conflicts derived from different tiers of decision-making.

The paper is organised into three main sections. In the first part of the paper, the authors describe current English regional provisions and evaluate the degree to which Regional Planning Guidance and Regional Development Agency Economic Strategies can effectively deliver sustainable development. The second part of the paper then explores the use of SEA as a means of achieving sustainable conflict resolution and considers the benefits which are to be derived from effective SEA application. In the final part of the paper, the authors suggest how SEA can aid the realisation of sustainable development within the context of current UK regional provisions. Although the authors highlight the fact that the UK government has made tentative steps towards the development of a system of regional environmental assessment, the paper concludes that such provisions are too limited in scope and that a more dynamic and comprehensive SEA system is required.

England, regions, planning, devolution, SEA

Systems Approaches for Strategic Environmental Assessment in New South Wales Local Government,

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Many of the established tools for sustainability planning and strategic environmental assessment (SEA) assume that the objectives of and issues for assessment are well defined and articulated. However, sustainability planning and SEA frequently encounter poorly defined or "wicked" problems characterised by high levels of complexity, uncertainty, conflict and controversy. Stakeholder dialogue during a scoping phase is widely promoted in order to capture alternative perspectives; however, the analytical phase of SEA generally remains the province of supposedly objective and dispassionate experts. This paper explores some of the methodological alternatives available to SEA practitioners from the application of "systems thinking" and learning organisation approaches. Several strands of systems thinking are evaluated in terms of their possible contribution to SEA. Drawing on the author's experience with local government planning in New South Wales, Australia, it is argued that these systems tools are of great value, particularly when applied in SEA processes that adopt an interdisciplinary, participative and learning-oriented approach. The importance of institutional structures (particularly legislative frameworks) that support such a conception of SEA is highlighted.

strategic environmental assessment, systems thinking, local government

Sustainable Approach to Wastewater Treatment Plants Design

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Systematic approach of design of wastewater treatment plants is usually focused on the basis of the best economic and technical solution. Processes are differently chosen relating to different characteristics of wastewater loads, sometime forgetting that a design can be functionally correct but can produce serious impacts on its surroundings.

In Europe growing interest in environmental issues and scarcity of land due to high density of population makes difficult the siting of wastewater plants in urban areas. Advances in legislation increase the consideration given to evaluate adverse effects which may result from the possible solutions upon the social, economic and environmental resources of the area.

The paper will discuss environmental impacts due to wastewater treatment plants with a "general to specific" approach. Different issues followed in siting issues in UE and in USA, cost effectiveness of technological solutions in developed and developing countries and specific environmental impacts are briefly presented. A screen is proposed useful to help the identification of wastewater treatment process alternatives and to identify best solutions related to specific sites. Potential adverse impacts are examined, discussing how it is possible reduce to an acceptable level or mitigate by structural or not structural measures visual, odor and sound impacts.

design, wastewater treatment plants, environmental impacts

SEA of Marinas in the Region of Liguria

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The 8000 kms of the Italian coastline are a complex, dynamic and unique system, created through centuries of human pressure and continuous degradation. The area is densely inhabited; population growth, continuous urbanization, the exploitation of the sea bottom for industrial purposes, the hazards stemming from maritime traffic, agricultural methods, uncontrolled fishing and many other factors have a considerable impact on the environment and the coastal growth management. Tourism has its responsibilities for the state of the coastline and the quality of its environmental resources: many typical features of the Italian coastal ecosystems have already been swept out. On the other hand, the tourist industry is aware of the potential of the marine environment and the affluence this could generate, if correctly exploited. Policies to protect, preserve and improve the quality of the marine environment have been defined at national level. For the first time in Italy, the regional administration has drawn up a locally coordinated coastal plan (Piano Territoriale di Coordinamento). The municipalities of the coastal areas will be the main actors, although they will play their part in the wider context of a national strategy.

The SEA of the Regional Costal Plan of Liguria has

managed to strike a balance between the need to develop marinas and to follow the conservation requirements set by regional and national policies.

With the use of a matrix, we developed scenarios which could minimize environmental impacts, by limiting the number of marinas, after taking into account the carrying capacity and environmental emergencies due to the global climate change.

strategic environmental assessment, integrated costal zone management, coastal tourism, Italy

Percolation and SIA in Urban Planning

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The Urban Impact Evaluation takes many parameters into account: air and water quality values, availability of green areas, entropy of energy cycles to be kept under control, the problem of the urban sprawl. One of the keys to urban and regional sustainability is maintaining the ratio between source and sink.

We suggest the generalized use of the landscape ecology analysis, before drawing out any urban plan and before any evaluation of urban impact. Plans and projects must comply with the need to maintain continuity between source and sink: this is an indispensable pre-requisite to any sustainable plan or project.

It is therefore necessary to apply the theory of percolation as a first step to any work, plan or project, in order to achieve a higher than positive percolation value (pc higher than 0.59).

The percolation indicator will then be the most reliable value found so far in an ecologically oriented planning and evaluation exercise.

To this purpose we have experimented an application model valid for Mediterranean coastal urban areas. The model was tested and gauged on specific coastal sites and situations: the shoreline project in Cervia (Ravenna, Emilia Romagna Region, 1999), the revision of the Pozzallo master plan (Ragusa, Sicily, 2000), the Strategic Impact Assessment (SIA) of Kenzo Tange Master Plan in Jesolo (Venice, work in progress, 2001).

strategic environmental assessment, urban planning, landscape ecology, percolation

Adding a Health Component to SEA and EIA, with Reference to Periurban Development

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It is widely recognised that health is a neglected component of both EIA and SEA. There are a number of current initiatives that are designed to remedy this problem. These will be described. At the same time, it is not always clear to a nonhealth audience what kinds of health concerns should be addressed. The paper will describe some of these health concerns with reference to the urban and periurban environment of developing country cities. Further confusion arises because the term health impact assessment is used in different ways and some of these will be described. The advantages and disadvantages of adopting a quantification approach will be included. There is a growing consensus that the method of health impact assessment is based on analysing how the determinants of health may be changed by a policy, programme, plan, or project. It is not always clear what constitutes a determinant of health. These can be broadly classified into biophysical factors and social factors. Both are equally important. Even where an assessment is driven primarily by concern about the biophysical environment, the social determinants of health require attention. This will be illustrated by examples.

health, environment, strategic

Taking a Fresh Look at SEA's Role from a Decision-making Perspective

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The paper aims to address the basic – but arguably fundamental – questions about why we think we need SEA, and what it can do for us. It argues that theoretical perspectives on the role (and limitations) of assessment methods such as SEA can be enriched through the cross-reference to decision-making theory and policy-making theory. The relevance of these theories can be traced back

to the most common definitions of SEA, which stress its role in supporting strategic decision-making processes (programmes, plans and policies). It therefore seems essential to understand how an assessment process can influence them, what stages it can relate to, and how it can identify and influence the type of considerations made in these context.

The paper refers to a number of case studies (in the transport sector) to argue that the assessment culture, and the political and planning context within which SEA is applied, can dictate much of the scope and form of the assessment. This leads to a discussion about the potential contribution of SEA to sustainability and long term change in the organisational and cultural characteristics of policy-making institutions. Some of the issues raised here may also have important implications for how we present and use good practice examples and the lessons learned from them.

SEA, role of SEA, decision-making theory, policy and political context, sustainability

Environmental Assessment of Trade Agreements: Initiating a Process in the Latin American Context

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About a decade ago environmental assessment started to be applied to the trade liberalization process. To date, multilateral organizations, like the WTO, UNEP and OECD, have set up environmental committees and are making specific recommendations about environmental assessment of trade agreements. Countries like Canada and the USA have executive orders that make the environmental review of trade agreements compulsory. Recently the concept of "Sustainability Review of Trade Agreements" has been gaining popularity, broadening therefore the environmental dimension of the assessment.

The situation in Latin American countries is quite different though. In many occasions environmental reviews are seen as threats to a freer trade regime. The base line information – required to pursue an environmental review – is scarce. There is little experience with environmental assessment processes in general. And, in some cases, there is a lack of transparency and of a consultative approach towards decision making.

Although there has been substantial progress in the international experience of environmental assessment of trade agreements, there is still much to do to adapt such processes and methodologies to the Latin American reality. This paper will present the activities and partial results of a two-year research project about how to adapt and implement a participative assessment of the FTAA agreement in Chile.

trade and environment, environmental assessment of trade, public participation, strategic environmental assessment

Public Participation in the EIA System in Chile: Preventing the Conflicts?

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The prevention of conflicts, and their negotiated resolutions in case they arise, has always been a major task attributed to public participation within the EIA system. A two-year research project in Chile was dedicated to answering the question: What key factors in our public participation experience, within the EIA system, can contribute to preventing and resolving conflicts? Two case studies were studied: a pulp mill development project (a private investment of over one billion US dollars) and an urban highway development in Santiago (a public investment of over three hundred thousand US dollars). The study of both cases reveals a number of concrete recommendations for possible changes to the EIA system. Additionally, two major issues – the need for participative social impact assessment and for participative urban planning – were identified and studied.

The progress we need to make is, however, not only restricted to the EIA system but also refers to the broader cultural dimension, suggesting the need for major changes in our political culture. What is finally in play is our capacity for a democratic coexistence, characterized by tolerance, dialogue, and the search for agreements. This is, undoubtedly, a major and long term goal.

Environmental conflicts are a permanent reminder that the idea of “sustainable development” must be put in practice

through the construction of negotiated agreements between economic, environmental and social interests. Public participation has, therefore, an important role in paving the road to the changes we need. This paper will present the main results and recommendations drawn from this research project.

public participation, EIA, social impact assessment, urban planning, conflicts, Chile

Public Participation in the Forestry Sector in Chile

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Among the main barriers to additional forest development in Chile are the difficult relationships between the companies and neighboring communities as well as environmental concerns. This paper presents the development, results and lessons of a public involvement program in the case of a medium size forest company in Chile (Forestal y Arcola Monte Aquila, part of the Shell Group), and one of its neighboring communities, the city of Curanilahue (about 30,000 inhabitants). The program’s objective was to enrich the relationship between the company and the community, in order to contribute to a better quality of life for the community and a better productive performance for the company. A main concern for the company was the occurrence of forest fires and its correlation with a deficient relationship with the communities.

The involvement program implemented was inspired by Desmond Connor’s approach to “constructive citizen participation.” The program had four steps. In the first step both the company and the community were systematically studied. Issues such as history, past conflicts and issues, leadership, channels of communication, and mutual perceptions were covered and analyzed in both cases. This first step was the basis

for defining the most appropriate ways to continuing with the program. The second step was dedicated to informing the community about the company, this program and the corresponding activities. The information was conveyed through “responsive publications” that included a detachable coupon requesting opinions and comments. Through the publication the community was invited to the third step of the program: a face-to-face meeting in the format of an “open house.”

Both company and community have considered the program very successful. The main issues of concern for both

parties were identified, and creative solutions are being implemented.

public participation, forest sector, Chile

The Environmental Impact Assessment in Chile and its Relation to Foreign Direct Investment in the Forestry Sector: the Trillium Case

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The Rio Condor lumber harvesting project in Tierra del Fuego, located in the far south of Chile, owned by the U.S. firm Trillium Corporation, had taken a series of initiatives that went beyond those required under the Chilean Environmental Law. Even though the forestry project has provided an "acid test" for Chile's incipient environmental legislation.

The case, which has mobilized a wide range of actors in favor and opposed to the project, has finally been approved, after three years of delay, in 1998, subject to a series of conditions that must be met in the future.

The multifaceted aspects of this case have provided insights and raised questions concerning the efficacy of Chile's Environmental Impact Assessment System.

Trillium Corporation arrived in Chile with a new environmental ethic and with the idea of implementing sustainable forestry based on adaptive management principles. In spite of this, its Rio Condor forestry project has been subject to the criticism of extremist environmental groups, a prolonged process of public discussion and had become a emblematic environmental conflict in Chile.

The goal of this paper is to analyze the context in which the Rio Condor Project took place in order to understand the potential and limitations of the environmental regulations for Foreign Direct Investment in the forestry sector in Chile. To reach this, the paper presents the local investment context, the environmental regulatory framework, and a map of the social process that took place. Further, the paper presents the participants of this process, their perspectives, and the situations they faced during the approval process by the Chilean Government and Courts.

Foreign Direct Investment has contributed to consolidating the country's integration into the international economy in the last decade. The paper will seek the relationship between private investment and the environment protection in the Rio Condor project and analyses the outcomes and effects of the social process over this topics. The

recommendations are made in the light of the opportunities for attracting more private investment to the forestry sector and enhancing the capacities of the Environmental Impact Assessment System.

Chile, native forest, foreign investment

Cumulative Impacts in Southeast Florida Marine Habitat from Offshore Dredging for Beach Fill Activities

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The United States Army Corps of Engineers is currently involved in filling an inordinate number of beaches along America's seashore. The main sand gaining method that the Corps uses for these projects is dredging from offshore sand deposits. They place this limited mineral resource on eroding beaches. The offshore dredging areas are commonly referred to as borrow pits; however, borrowing is somewhat of a misnomer because it is unlikely that the sand will ever be returned to these fragile ecosystems.

A great deal of these dredging activities occur in the southeast coastal areas of Florida. This area contains coral reefs, hard bottom ecosystems, and important transition zones. Extensive dredging activities threaten this fragile combination and essential fish habitat. The report highlights the lack of information about these effects, explores the environmental impacts of sand dredging on these biologically sensitive areas and analyzes the shortfalls of the current regulatory regime.

The analysis is tailored to Dade, Broward and Palm Beach counties. This unique coastal region will be irreversibly damaged if the frequency, size or number of these dredging projects persists.

The report begins with an identification of the counties within the case study area and the corresponding offshore dredging sites. A detailed description of the dredging activities is presented. Then, the authors describe the underwater ecosystems and the diverse life within them. Next, the Army Corps' current offshore dredging activities and the possibly irreversible impacts of this destructive process on these delicate ecosystems is discussed. The National Environmental Policy Act and other federal regulations apply to these projects. Finally, the paper

includes an opinion as to whether the impacts of dredging are sufficiently considered within these requirements.

The findings highlight inadequacies of the documented impacts. Cumulative impacts of past, present and future offshore dredging is superficially covered. The lack of concern for the cumulative impacts could result in irreversible impacts to this extremely fragile ecosystem.

cumulative impacts, NEPA, marine habitat

Development of a Framework for Joint Implementation Measures in Developing Countries to Reduce Green House Gases in the Atmosphere

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Concentration of GHGs in the atmosphere is rising rapidly, mainly because human activity is changing the way the atmosphere absorbs and emits energy, changing the world's climate. The international community has recognized climate change as a serious problem and as a result, the 1992 United Nations Framework Convention on Climate Change (UNFCCC) became the first binding international legal instrument to address the issue precisely.

The UNFCCC establishes the possibility for joint implementation measures to reduce GHGs between industrialized and developing countries in Article 4.2.a, initiating a process still under development for joint

implementation measures to fulfill the objective of the Convention.

In 1997, the Parties to the Convention adopted the Kyoto Protocol including commitments to reduce their overall emissions of GHGs, by at least 5% below 1990 levels between years 2008 and 2012. The Protocol also established emissions trading, joint implementation between developed countries, and a Clean Development Mechanism (CDM) to encourage joint emissions reduction projects between developed and developing countries.

The main purpose of the CDM is to assist developing countries in achieving sustainable development and contributing to the UNFCCC objective. Therefore, a developing country must create the adequate political, institutional and technical framework to participate in the

implementation of these mechanisms. This research develops such a framework

The IDB Environmental and Social Requirements for Environmental Management of Large Scale Infrastructure Projects

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The mandate of the Inter-American Development Bank for direct financing to private sector investments focuses on large infrastructure projects in energy, transportation, water and sanitation, communications, and capital market sectors. The Environmental and Social Unit (ESU) of the Private Sector Department (PRI) has adapted the IDB environmental and social requirements to reflect the specific characteristics and aspects of private sector projects and activities. The fundamental environmental, social and health and safety requirements for PRI projects are:

- Compliance with all applicable in-country environmental, social, health and safety legal requirements;
- Compliance with all the IDB environmental, social, and health and safety policies and guidelines;
- Promotion of information disclosure, stakeholder involvement, and transparency.

In addition, the ESU also requires that the Project sponsors (a) adopt sound environmental, social, and health and safety practices and management systems, and (b) promote positive externalities related to the Project, at the local and regional levels. The ESU encourages environmental, health and safety managers to place environmental and social issues on the agenda at all levels of their organizations – from operations to finance and administration. ESU also fosters and supports project sponsors in their efforts to make environmental management pro-active and cost-effective and to integrate environmental, health and safety management into core business practices.

The ESU also encourages the sound use of IA and EIA (when required) as a first step to develop project-specific environmental management plans or corrective action plans (when required). The ESU believes that cost-effective pollution prevention and clean production projects can improve operations.

One of the main objectives of the ESU is to ensure that the Bank provides environmental and social benefits

additionally to projects, not only by ensuring that negative impacts are minimized and mitigated but also by encouraging and assisting sponsors to develop initiatives to maximize the company's environmental and social contribution to the local communities.

Piecing Together the Jigsaw of Environmental Management Tools: A Model

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The need to understand the relationships between environmental management tools (e.g., EIA, SEA, LCA, EMS, etc.) is receiving increasing recognition. At IAIA'00, the authors, in a similarly titled paper, proposed the development of a comprehensive model of environmental management to improve understanding of the relationships between different environmental management tools. This is a follow-on to that paper, reporting work in progress. It describes the research methodology and a preliminary model of environmental management tools and concepts. It characterises a range of environmental management tools and concepts along several dimensions, including, *inter alia*, methodology, data requirements, data input, users, applications, legislative status, environmental management "attitude," and organisational structure. This umbrella model is used to identify relationships between different environmental management tools across these dimensions. The paper

demonstrates the value of our model-building approach for improving the understanding of environmental management.

environmental management, EIA, SEA, environmental management systems, life cycle assessment, environmental auditing, environmental reporting

The Development of Real-time Environmental Impact Assessment Review Procedures

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Most established guidelines for reviewing environmental impact assessments adopt a historical perspective. This perspective is used because the aim of most published reviews has been to monitor change over time in either the nature or quality of environmental assessments. This paper presents a structure that has been developed to assist persons responsible for real-time review to assess the adequacy of project related EIAs and to guide subsequent action. The stress is on quality assurance and good practice rather than change through time. Two fields and nine areas of review are suggested. The first field is quality assurance, which includes review of:

1. professional ethics
2. adequacy of information
3. clarity of communication
4. due consideration of alternatives.

The second field is procedural and covers review of:

5. description of project and affected environment
6. legislation, policies and plans
7. scoping and participation by interested and affected parties
8. assessment and evaluation of impacts
9. mitigation, enhancement, management and monitoring

The guidelines consist of a number of key questions, supported by key considerations and information boxes pertinent to each review area; the reviewer is guided to assess the adequacy of the EIA as a sound and reliable basis for decision-making. The principles underpinning EIA and

good decision-making form the basis for such judgements. The reviewer is provided with a structured assessment form on which the adequacy of each review area is noted. Based on these entries, and guided by a table addressing possible review outcomes, the reviewer completes a report summarising the findings of the review and indicating where and what further action is needed.

EIA, review, quality assurance

Why is Social Impact Assessment the Orphan of the Assessment Process?

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With the possible exception of New Zealand, social impact assessment (SIA) has not been widely adopted as a component of the assessment process for project or policy appraisal. The reasons for non-adoption are many and varied. First and foremost, there is minimal consensus as to what it is. Secondly, there is little agreement on the relationship between social impact assessment (SIA) and environmental impact assessment (EIA). Indeed, are they related and should the two processes be done collectively or separately? When is social impact assessment required? If it is not required and does not contribute to the assessment of resource development projects, then why do it? What were the origins of SIA and why was it seen as important in the first place? What is included in a “social impact assessment”? Does a body of research findings exist that tells the practitioner what to assess and how to proceed? Do we have examples where a social impact assessment has actually made a difference or been followed in the appraisal process?

In this paper we focus on the “sociology of knowledge” question—is there evidence that we are accumulating a body of knowledge that can be labeled social impact assessment? Whether SIA has become institutionalized will only be partially addressed in the paper and then only in the sense of whether we have accumulated a SIA knowledge base.

Our source of data is a content analysis of all the articles published in the two main impact assessment referred journals – *Environmental Impact Assessment Review* and *Impact Assessment and Project Appraisal*. These two journals

are the repository of knowledge in the field as well as providing a history of how impact assessment developed as a policy discipline and research topic. We wanted to know how many articles had been published on SIA. How was SIA labeled – social impact assessment or social assessment? What is the content of refereed SIA articles? Are the papers dealing with findings about SIA or procedures, that is, steps in the process. And a final question—have the Guidelines and Principles for Social Impact Assessment (1994, 1995) been influential in guiding the research and practice of SIA? Each of the above questions are addressed based on the content analysis of the 160 articles on social impact assessment appearing in the two journals since founding.

Learning About Social Change: Using Social Impact Assessment in the Planning/Decision Process (Poster)

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This poster illustrates the use of social impact assessment at the community and project level to help planners, change agents, elected officials and concerned citizens understand likely future change in their community as a result of project implementation or policy change.

After a brief definition of social impact assessment and a history of its use in the planning process, the basic Social Assessment Model is laid out. I provide visual examples of how an SIA matrix can be used in a variety of project and policy settings. Next the SIA scoping process is outlined as the way to identify likely social impacts (issues) based on past research and assessments of similar project and policy changes.

The content of the social assessment (analysis) is made up of 28 social impact assessment variables (social science concepts) which I use to explain change in a variety of project/policy settings. These indicators have been extracted from completed environmental and social impact assessments and ex-post facto social science research on rural and urban communities. Next is a definition and ways of measuring and analyzing selected SIA variables, followed by demonstrations of significance and procedures for reducing

the number of SIA variables to fit a project setting. The use of different data sources for social assessments is also shown.

The presentation includes a ranking procedure for the selection of significant SIA variables. Once identified, these SIA variables become the basis for mitigation and enhancement of the change process. Examples of mitigation and enhancement alternatives are displayed for a representative project. The poster concludes with an outline for presenting the analysis and the SIA key citation index.

Practical Suggestions for Planning a Project-initiated CEA Study

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The current practice of environmental impact assessment (EIA) is largely derived from worldwide professional experience aggregated from conducting impact studies on numerous types of projects. Current and future practices related to incorporating cumulative effects assessment (CEA) within the EIA process for proposed projects can also be aided by incorporating professional experience. Based on several recent planning efforts regarding project-initiated CEA studies, this paper summarizes practical suggestions derived therefrom. These suggestions represent considerations which can be useful in improving the process by which CEA can be incorporated in the EIA process for proposed projects. The suggestions are related to: (1) preparation for study planning by reviewing key court cases, establishing an inter-agency coordination team, and the use of peer reviewers; (2) use of the Worldwide Web throughout the process; (3) determination of the impact footprint for the proposed project followed by selection of impact indicators, and development of cause-effect linkages via use of adapted checklists, matrices, and/or networks; (4) inclusion of cumulative effects in the scoping process; (5) identification and aggregation of historical baseline information; (6) selection of descriptive, conceptual, or quantitative models for quantifying cumulative effects; (7) coordination with various governmental agencies in the development of significance criteria for impacted resources, ecosystems, and human communities; (8) delineation of governmental agency management goals for the impacted components; (9) coordination with various agencies in planning monitoring and mitigation for the significant cumulative effects; and (10) dealing with inadequate information on future actions and inadequate understanding of fundamental scientific information on impacted resources and ecosystems.

Environmental Assessment in Changing Societies: Lessons from Transitional Countries of Eastern Europe and the Former Soviet Union

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Between 1985 and 2001, the 27 transitional societies of Central and Eastern Europe and Central Asia introduced more than 100 legal acts on Environmental Assessment (EA) and subjected dozens of thousands of proposed activities to this procedure. Their goal has been to transform EA from a technocratic appraisal integrated into centrally planned economies to a more transparent procedure, designed to ensure interdisciplinary analysis of environmental impacts and linked to publicly accountable decision-making. The paper aims to describe the key driving forces and the practical outcomes of this transition.

The main driving force in the reform of EA systems has been the change in their societal context. The main policy agendas – environmental protection, democratisation of decision-making, market reforms and conforming to international requirements – along with the institutional context of EA regulations and practice have influenced both the change of EA systems over time and the regional variations in the patterns of their evolution.

The evolution of EA has followed distinct regional patterns. In most Central European nations, EA systems have been radically reformed to approximate the procedures used in developed countries. In contrast, EA in most of the former Soviet republics is still based on a procedure inherited from the USSR and substantially different from 'Western' EA. Finally, about one-third of the transitional countries, severely affected by regional tensions and conflicts or especially profound social and economic dislocation, have, so far, failed to establish functioning EA systems. Throughout the region, there has been a gap between EA legislation and practice, especially concerning interdisciplinary analysis of environmental impacts, public participation, and utilisation of EA findings in decision-making.

The paper argues that an effective EA system reform should be "in gear" with socio-economic transformations by demonstrating how "advanced" EA regulations failed in unreformed societies and how "stagnating" EA systems have become obstacles to economic and environmental reforms.

environmental assessment, countries in transition, Central and Eastern Europe, market reforms, democratisation

Managing Cumulative Effects of Multi Large Projects

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The paper demonstrates an approach to regional cumulative effects management, of multiple large scale projects, using the case of oil sands development in Alberta, Canada. The 17 existing, approved or planned projects, all concentrated in a relatively small region, pose significant challenges for impact assessment. This activity does present an alternative to conducting and reviewing cumulative effects on a project by project basis. In response, stakeholders have initiated a Cumulative Environmental Management Association. Advantages of this approach include 1) more efficient gathering and sharing of information, including a common database, 2) setting acceptable regional environmental thresholds for all projects, 3) collaborative assessment of similar cumulative effects from related projects, 4) coordinated regulatory review and approval process for overlapping cumulative effects assessments, and 5) institutional empowerment from a Regional Sustainable Development Strategy administered by a public authority. Resourcing this initiative has challenged all stakeholders to provide funding for stakeholder involvement, research and administration in a fair and equitable way. Working groups, organized for specific environmental themes, develop a work plan and manage the individual research, monitoring and inventory initiatives. The working group results are used to develop regional environmental thresholds. This case provides a model for integrating project-based cumulative effects assessment with regional management of cumulative effects.

EA of large scale projects

Environmental Considerations for Corps of Engineers Projects

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With over 200 years of support to the United States in civil and military works, the mission of the U.S. Army Corps of Engineers has evolved to incorporate environmental stewardship into its planning process for ongoing and proposed projects. This evolution has resulted from a greater awareness of the impacts of its actions on natural resources and also a necessity to comply with federal environmental laws and regulations that have been enacted over the past 50 years. Before any major project can be undertaken, the National Environmental Policy Act (NEPA) requires that an environmental impact analysis must be completed. In order to conduct this environmental analysis, investigators must first examine and describe the current environmental conditions that exist within the proposed project area. Resources examined to compile this baseline data include in part: land use, air quality, noise, water resources, soils, infrastructure, hazardous and toxic substances, biological resources, cultural resources, and socioeconomic conditions. The beneficial or adverse effects of implementing or constructing the proposed project on these resources are then analyzed and described in the environmental impact analysis. This environmental analysis document and its conclusions about impacts are made available for public review and comment and help to guide Corps of Engineers decision makers about whether, or how a project should be implemented. Many tools are now available to more accurately assess the potential impacts to our environment. These tools include GIS, hydrologic, hydraulic, and water quality models. My presentation will address some of these tools and their application in the environmental impact assessment process.

Organization Development for Public Participation: The Next Challenge

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Public participation connects an organization, corporate or governmental, to its various publics interactively. The social technology for public participation is by now fairly well developed. But what happens if the organization's internal communications are poor and its management is ineffective? Informed publics, expecting real-time responses to their questions and suggestions, will quickly become frustrated. The organization's internal systems are likely to crash and burn – what to do?

There are five dimensions to internal communications – how rapidly and effectively do information and questions get (1) IN to the system from its various publics, (2) OVER to other parts of the system which need to know, (3) UP to senior management without selective screening, (4) DOWN to the working level once a senior management decision has been made, and (5) OUT to the concerned publics? In my client workshops, participants usually identify major deficiencies which form an agenda for the organization's Human Resources Dept.

There are five functional issues which any system must manage: (1) define, monitor and achieve its goals, (2) adapt to changes in its internal and external environment, (3) develop standard operating procedures for recurring activities, (4) manage the tensions which develop when work is done, and (5) develop and maintain its esprit de corps or morale.

A brief overview of organization development will be provided so that session participants can visit in-house or other human resources staff and discuss how internal communications and management can be improved in their organization, especially through participative management.

public participation, internal communications, management functions, organization development

Public Participation and Personal, Organizational and Cultural Group Values

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As I live and work overseas, I find it important to become aware of my own values, those of client organization and those of other cultural groups involved in a project. How do I make choices when faced with ethical issues which arise out of diversity in gender, ethnicity, nationality, etc.? How do the client organizations and other cultural groups make their choices? One way to deal with these questions is to examine

them using a common framework. Some years ago, I found the schema of "Variations in Value Orientations" developed by anthropologist Florence Kluckhohn and others in the early 1950s useful. Using it, we can become aware of and compare our own values, those of our organization and those of a cultural group; then identify values shared by all three as a strength to work with, unshared values to acknowledge and respect, and values in conflict which we need to address. Here is Kluckhohn's framework:

1. Time - what is your usual time preference? Future: seeking change, Present: accommodating change, or Past: maintaining tradition?
2. Human Relations - how do you relate to others? Lineal: a hierarchy based on age, expertise or experience, Collateral: seeking consensus or reciprocity, or Individualistic: based on self-reliance & majority rule?
3. Person-Nature - how do you relate to the forces of nature? Mastery over: controlling the forces, Subject to: controlled by the forces, or Harmony with: balancing control between you and the forces?
4. Activity - how do you express yourself in activity? Doing: emphasizing external activity, or Being: focusing on expressing your human personality?
5. Human Nature - how do you view human nature, and is this fixed or changeable? Evil: fatally flawed, Neutral: neither good nor evil, a Mixture of Good and Evil, or Good? Do you see each of these conditions as mutable or immutable? E.g., the assumption that people are born sinful but may be saved.

public participation, values, value orientations, Kluckhohn

The Public and Healthcare: A Radical Proposal (Poster)

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Across Canada and the world, access to health services at an affordable price is a priority issue. Adding user fees, permitting a parallel private healthcare system and increasing taxes are not real solutions. I propose that we engage more informed and responsible citizens as partners in this enterprise. After a brief historical review of healthcare in Canada and a definition of health, a summary of recent surveys of public attitudes, knowledge and behaviour is provided. The publics for healthcare are identified and an analysis of the general public is outlined using two variables – knowledge and motivation. This generates four types of people: Informed Actives,

Uninformed Actives, Informed Passives and Uninformed Passives.

A model of public management, a provincial highways department, is examined. The public management of drivers works because: there are clear goals and rules of the road, a minimum and tested level of driving literacy is required, strong motivation (positive and negative) is provided. This model is applied to healthcare to raise the levels of knowledge, e.g., a health literacy test, and motivation, e.g., through graduated premiums for medical services plans. Some reflections bring out the parallels between managing drivers and managing citizens about health. The nature of citizen engagement is reviewed and applied to health. In conclusion, the elements for national and community-level programs are identified. By creating opportunities for citizen engagement, people can work on health issues with their neighbours, health administrators and elected officials. When citizens become more informed and active on health issues, a more streamlined, efficient, effective and affordable healthcare system is in sight. See the Library at www.connor.bc.ca/connor for background information.

healthcare, public participation, citizen engagement

An Introduction to the Euro-Mediterranean Free Trade Zone

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Source Document: *Euro-Mediterranean Free Trade Zone: Implications for Sustainability. Case Studies, Assessments and Recommendations. Friends of the Earth Middle East.*

In 1995, 27 governments and the European Union signed the Barcelona Agreement, a joint policy initiative to increase political, economic and cultural ties between countries around the Mediterranean Sea by forming the "Euro-Mediterranean Partnership." The Partnership includes Algeria, Cyprus, Egypt, Israel, Jordan, Lebanon, Malta, Morocco, the Palestinian Authority, Syria, Tunisia, and Turkey, and the 15 member states of the European Union.

The main goals of the Partnership include:

1. Definition of a common area of peace and stability through a reinforcement of political dialogue and security.
2. Construction of a zone of "shared prosperity" and the gradual establishment of the region as a free trade zone, to be functional by the year 2010.

3. Rapprochement between peoples through a social, cultural and human partnership.

To date the economic program with its focus on creating a regional Euro-Med free zone (Mediterranean Free Trade Zone) has received the most attention. The Mediterranean Partner Countries (MPCs) represent a very minor share of the EU's economy, but the EU accounts for approximately half of the total trade of the MPCs. Given the heavy economic dependence of the MPCs on the EU, the Euro-Med's trade liberalisation program will have a profound effect on the economies and lifestyles of the MPCs. Work has begun on achieving a balance between economic development and social stability, but associated impacts on the environment and long-term sustainable development have not yet been addressed. To begin to fill this gap, Friends of the Earth-Middle East and partner organizations in Egypt, Israel, Jordan and Palestine undertook five case studies to provide insights into some of the most significant issues at stake.

trade, trade agreements, resources, industrial countries/developing countries

Socioeconomic Impact Assessment and Management: A Proposed Methodology

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The paper summarizes a methodology for the assessment and management of socioeconomic impact of projects. This methodology was developed through 20 years of field experience in different kind of projects in Latin America. The proposed methodology makes use of existent environmental impact assessment methodologies and integrates socioeconomic component at the early technical stages of a project. The methodology develops this component in each one of the following stages: (i) screening and scoping of the main features of the project and the region where it will be located, (ii) socioeconomic diagnosis of the region and the communities involved, (iii) description and analysis of the project, (iv) impact identification, (v) impact assessment, (vi) formulation of impact management plan in order to enhance the positive impacts and prevent, control, mitigate or compensate adverse impacts, and (vii) implementation and evaluation of the management plan. The importance and methodology for each stage is analyzed as well as the main tools to be used.

methodology for socioeconomic impact assessment, integration of socioeconomic impact assessment to environmental assessment

Reasons for Weak Integration of Social and Natural Dimensions in EIAs

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Methodologies for Environmental Impact Assessment have been developing since 30 years ago. However, the integration of socioeconomic aspects in these methodologies is still very weak. This situation is due to several aspects. First, is the fragmentation of scientific knowledge during the XX Century and the separation of social sciences from others sciences. Second, the widespread assumption that every project was implemented for the progress of the human beings and for that reason they did not cause any harm. And third, the subjacent belief that mankind is the highest being on earth, with capacity and power to dominate nature. The lack of integration of natural and social dimensions into Environmental Impact Assessment has had several consequences: no attention to the impacts on communities affected by projects, overcosts for the late identification of impacts, and frequent conflicts between companies and communities, among others. The integration of natural and socioeconomic dimensions leads to holistic analysis of the projects, reduces the costs of studies and management plans, encourages community participation during the impact assessment and the implementation of management plans, creates synergies in the management of the impacts, and plays an important role for the sustainability of the projects.

socioeconomic impacts, integration for natural and social components

The Cheviot Mining Project: Lessons for Professional Practice

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The Cheviot Coal mining project is proposed for the Rocky Mountains in west central Alberta, Canada. The proposed open pit (surface) coal mine permit area is approximately 23 km long by 3.5 km wide. Overall, the proposal includes the construction, operation, and decommissioning of a coal processing plant, and the development, operation and reclamation of a large open pit coal mine.

In Alberta, the development of a coal mine is based upon a two-stage regulatory approval process. The initial approval stage deals primarily with the conceptual plans for the mine project as a whole. The second stage allows for site-specific changes to the conceptual plans approved during the initial stage of review. The two-stage approval process for coal mine projects is designed to look at the full range of likely environmental and technical issues associated with a project on a broad scale basis. In the case of the Cheviot Coal project, a federal approval from the Department of Fisheries and Oceans was also required.

From the aspect of environmental impact assessment, the Cheviot project involved both provincial and federal requirements. In addition, specific requirements for cumulative effects assessment came to be problematic for the project. The public hearing process and court challenges initiated by environmental groups opposing the project complicated the eventual regulatory approvals. The major lessons learned from this case study have had significant consequences for other projects undergoing assessment, especially in terms of the requirements for cumulative effects assessment. These lessons deal with such interesting issues as the treatment of future human activities in cumulative effects assessment, availability of information related to other industrial activities, and the management of cumulative effects.

This paper will document the review process, compilation of the environmental impact and cumulative effects assessments, and describe how legal and regulatory requirements affected the practice of impact assessment in this case. Emphasis will be on the lessons learned from what has been described as the most important cumulative effects assessment case study in Canada.

environmental impact assessment, mine development, cumulative effects assessment

How to Ensure 100% with an EIA Law: Canadian International Development Agency Case History

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The Canadian Environmental Assessment Act has been law in Canada since 1995. Although CEAA is a national law, it does apply to any federal departments including CIDA that are funding “projects” outside of the country. For the last 5 years the Environmental Assessment and Compliance Division of CIDA has been working very hard to ensure CIDA has the tools and information to properly apply the Act. Training was put in place, management frameworks signed, staff hired and manuals prepared. A casual inspection would make one believe that the Act was being applied well and effectively. During 1999 an internal corporate audit was done on compliance with CEAA the results of which were to prove otherwise. CIDA had obtained a compliance of 41%. One can be critical of audit results and question their accuracy. Nevertheless, the fact remains that compliance with the act was not satisfactory. These results can be attributed to lack of understanding about the Act, inadequate staffing, poor communication, CIDA culture, other priorities or workloads. The audit result caught the attention of CIDA’s President who quickly responded with a set of actions which are targeted at the audits findings. Having spent 4 years at the World Bank as Canada’s Executive Director as well as serving two terms as Environment Canada’s Deputy Minister, he was well versed on how public institutions need to respect environmental laws and policy. Following the release of the Audit, the President released a series of Directives which called for 100% compliance with CEAA. These directives specify how CIDA will respond technically and procedurally, and outline the management systems which need to be developed. Key to the compliance strategy is ensuring that no funds for projects can be released unless certain CEAA fields are completed in SAP, CIDA’s financial and project management system. As well, these fields can only be filled out by designated environmental specialists who must review the CEAA report and process before coding the required information in SAP which then allows project funds to flow. These responses to the audit have been met with quite a range of reactions and views. Lessons learned about the audit and subsequent actions will form the core of the presentation. This talk will be of interest to any EA practitioner who faces EA challenges with respect to compliance.

Canada’s First Nations, Development and Environmental Protection

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The link between First Nations in Canada, development co-operation and environmental protection overseas is not obvious. To some First Nations leaders, development efforts have ignored their concerns while favouring distant countries. To some in the international development community, First Nations appear to show little interest in the South apart from occasional humanitarian or political activity, and the cultural dynamics seem perplexing.

In reality, Canada’s First Nations – more than 630 communities and about a million people – are an untapped resource offering a unique pool of experience. In effect, Canada has several hundred developing countries here at home to learn from and co-operate with in their struggles for development. They share many of the challenges faced by developing countries: rural life, urbanism, health, education, women’s participation, private sector involvement, infrastructure, good governance, poverty reduction, and the environment. They present a wide range of models and innovations, from the independence-oriented James Bay and Northern Quebec Agreement to the integrationist Nisga’a treaty.

Some communities have produced important learnings based on their own principles and social structures – and various mixtures of this indigenous knowledge with Euro-American approaches have produced some spectacular successes, moving certain communities to full and rich development in one generation. The lessons learned should be of interest to the development community, and the First Nations themselves may be enriched by involvement with international communities.

This paper tries to show the value, to international development, of First Nations approaches – and, conversely, what in international development may be of interest to First Nations. It begins by noting relevant aspects of First Nations culture and history that explain apparent reticence to become engaged in international development. After describing development principles adopted by First Nations, and some international development projects undertaken by them, it outlines what First Nations can offer the majority culture, in terms of learning about environment and development, and suggests what aspects of international development are of potential interest to First Nations.

Environmental and Social Management Plan for the Cana Brava Hydroelectric Power Plant (Cana Brava HPP)

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Cana Brava Project involves the construction and operation of a 450-MW hydroelectric power plant and the construction of a 60-km 230-kV transmission line. The Project is located on the Tocantins River, between the municipalities of Minaçu and Cavalcante in the State of Goiás, approximately 250 km north of Brasília, in the mid-west region of Brazil.

The Project is among the first private projects to be developed under the new institutional and regulatory framework established in 1995 and 1996, and is also one of the first Independent Power Producers (IPP) or self-generators to be financed under a project finance scheme in Brazil. The concession was obtained by Companhia Energética Meridional (CEM), which is a subsidiary (SPC) company of Tractebel Group. The environmental and social impact assessment of the Cana Brava HPP includes the biological, physical and economic impacts caused during the construction and operation period.

The consistence and performance of the Environmental Management Plan, detailed in Environmental and Social Management Plan (ESMP) to Cana Brava Hydroelectric Power Plan are described in 19 specific programs covering many subjects of regional scientific interest such as the “cerrado” flora and fauna, archeology, environmental education water quality and site contingency and emergency plans. It also includes several social programs related to the resettlement of the people affected by the 139km²-reservoir, social, as well as health and sanitary compensation to the Minaçu city (which is located on the very edge of the reservoir area). Since the IDB was included in the financing process, the mitigation and management of the environmental and social impacts gained more relevance, when compared with the requirements of the in-country government agencies.

CEM sees the introduction of the IDB environmental and social guidelines as an important benchmark for the Brazilian national energy sector. Moreover, these environmental and social guidelines reflect the “good practice” in environmental and social management that CEM is proud to implement as part of its corporate policy and entrepreneurial vision of sustainable development.

The World Bank's Approach to Social Analysis

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This paper presents and discusses the conceptual framework that guides social analysis and the operational implications this framework has for the Bank. Social analysis is been used in the Bank as a framework for understanding the social factors that have an effect on development interventions as well as for assessing the potential social risks and impacts of those interventions. In the Bank's work, social analysis starts from the premise that the goal of social development is equitable and sustainable economic growth. Social analysis contributes to this goal by helping to design strategies for social inclusion and empowerment. Social analysis in Bank operations examines patterns of social diversity, social risks and participation in order to formulate strategies for social inclusion and empowerment, particularly of the vulnerable and the poor.

In Bank operations, social analysis helps to establish operational feasibility of proposed interventions by setting criteria and procedures for assessing social issues and social risks. The role of social analysis in lending operations is determined by a preliminary scoping exercise. Social analysis is carried out along with other technical analyses (economic, financial, institutional, environmental). As such, it is an umbrella that embraces the range of social issues relevant to Bank operations, including the social safeguard policies (involuntary resettlement, indigenous peoples, cultural property). Social assessment is carried out through a range of instruments, including socio-economic surveys, focus group discussions, case studies, participatory rapid appraisals, social audits, and social impact assessments.

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The Links Between SEA and EIA: The Practice

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In literature and in practice there are a lot of expectations concerning the relations between SEA and EIA. A prior SEA of a policy, plan or programme will have benefits for the following EIAs at the project level. These expected benefits are also used as an important reason to introduce SEA obligations. But what are exactly these links? Do they exist in reality? And under which conditions? These questions were the reasons for the EIA and SEA unit of the ministry to start a study of the links between SEA and EIA in the practice. This study was co-financed by the European Commission and covers experiences in several member states of the European Union.

The study concludes that positive relations exist but that they do not occur everywhere in the same way. Factors as tiering in the decision making system are important. Legally binding tiering does however rarely exist. And the decision making follows not always a rational path from policy to project level. The conclusions of the study will be presented: SEA does not replace EIA. SEA addresses other alternatives and impacts than the project level EIA. EIA is not always applied at project level but sometimes at the planning level. The conditions for these benefits are mainly a good communication between the levels and may be enhanced by legal arrangements. The reduction in time and costs for the EIA level of the application of SEA is however hard to prove.

The results of the study are available in print but also in the English section of the website of the ministry:
www.minvrom.nl

SEA, EIA, links, practice

A Role For Internal Audit In Achieving Compliance With EIA Legislation

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The Canadian Environmental Assessment Act (CEAA), applies to activities funded by Canadian tax dollars in Canada and abroad including CIDA's development projects. Internal audit provides independent and objective information to management to assist in making informed decisions. In 1998 CIDA's Executive Committee approved an audit of the implementation of the CEAA at CIDA. The audit reviewed CIDA's management framework and processes, then assessed CIDA's compliance with the Act. CIDA's Policy Branch was accountable for developing the framework while individual program branches were

accountable for actual implementation. The framework was judged to be exemplary. With appropriate management processes in place, it might have been difficult convincing management that compliance with the Act was significantly less than expected. Ultimately the careful application of five audit techniques allowed the auditors to present credible findings which guided management to focus on correcting problems. First, statistical sampling allowed projection of results right across CIDA. Second, the sample was kept confidential to avoid false identification of problem areas. Third, field staff were asked to sign observation sheets to prevent subsequent disagreement. Fourth, Policy Branch was kept aware of preliminary findings to avoid surprises when reporting. And fifth, an interim report identified the key finding: potential disconnect between the management framework, and implementation. As a result, management quickly accepted the audit results and took action to correct shortcomings. An action plan called for 100% compliance with the Act. Vice-presidents were made responsible to report compliance, and a follow-up audit was scheduled. The audit was credited with identifying the problems and supporting management decisions necessary to ensure full compliance. Every branch has undertaken extensive new training, and informal reports indicate compliance levels are now very high. We expect the report of the follow-up audit to be good news.

environmental legislation and auditing, Canadian Environmental Assessment Act, CEAA

Sharing Knowledge in the Institutional Framework of an EIA Process

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Impact assessment brings together people with various levels of expertise, different (institutional) backgrounds and different roles to play. A successful IA process requires that all parties involved have at least a basic understanding of the rules and regulations that guide screening on the legal need for IA on the one hand and analysis of the actual potential (bio)physical and socio-economic impacts (scoping) on the other. This is valid not only for the IA professionals, but also for project proponents, governmental organizations such as the competent authority and other institutions, NGOs and participants in the EIA process in general. This presentation will focus on concepts for knowledge sharing, recent developments in software supported instruments for knowledge management in general and the DR EIA program in particular. The paper illustrates the use of shared

knowledge in the frame-work of the institutional and organisational setting of participatory IA and EIA processes.

IA, EIA process, screening, scoping, participatory planning, knowledge sharing

Minimizing Impact of Transportation Infrastructure on the Environment and Biodiversity by Using SEA

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The complexity of habitat fragmentation caused by linear transport infrastructure to nature and fauna makes it difficult to describe its negative environmental influences. Although in an efficient environmental planning information of both new road construction projects as for managing of the existing road network, pragmatic instruments are needed to translate environmental data into decision-supporting information. At an early stage in the decision-making process projects are often still “open” and the proposition of alternatives can be important in order to reduce environmental impacts. In this perspective the vulnerability approach seems a promising instrument.

A methodology of vulnerability impact assessment (VIA) has been elaborated for the effect-groups habitat-loss and the barrier-effect on fauna caused by linear transport infrastructure. Existing biotic and a-biotic cartographic information – digitally available throughout the whole studied region Flanders (the northern part of Belgium) – and knowledge about dose-effect-relations and effect-prediction models have been used. The elaborated vulnerability maps formulate a spatial indication on the distribution of vulnerability to the considered effect-groups at the locations transected by linear transportation infrastructure. In combination with other data layers, including information on nature protection areas, on the ecological networks, fauna distribution data, etc., a priority-dataset of locations (“hotspots”) on the transportation network where negative influences for the ecosystem can be expected, is obtained.

In the ongoing master transportation plan of Flanders, the bottleneck locations deducted from the priority-dataset will be used in order to propose specific environmental (fauna) mitigation measurements on the Flemish transportation network.

vulnerability impact assessment, geographical information system analysis, transportation planning, habitat-fragmentation, habitat-loss, mitigation measurements

The Impact of Forest Road Construction in Ecuador

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The government of Ecuador currently has no health impact assessment policy, no procedures and no capacity to undertake assessments. However, it is engaged in a series of development projects with major health consequences. These projects like a road in the north of the coast near the border with Colombia are severely disrupting the livelihoods of indigenous forest dwelling peoples causing malnutrition and psychosocial disorder, changing the prevalence of vector-borne diseases and generating an epidemic of sexually transmitted diseases. It is probably too late to prevent any of this. However, by knowing the consequences of such projects, interventions can be implemented to reduce the negative effect of such factors on the population. Additional consequences seen in the area are: migration, intensive deforestation, land use change, ancient community practices loss.

This paper presents a description of the area, analyses the results of an evaluation of the changes telling how this case study of the health impacts of a road have been presented at a high level, high profile national government seminar under the auspices of the WHO launching a process of incorporation of health impact assessment policy and practices. The lessons learned will increase the capacity of the Ecuador government to manage its development more effectively.

Finally the document analyses how less ecologically disruptive economies where natural ecosystems are respected and valued and wealth resides in stocks of various types of capital determining that human, social capital while protecting natural capital should better protect and enhance health. After the incorporation with the global economy, this reality confronts an increasing income economy which is unlikely to enhance health, quite apart from its ecological devastating consequences.

Ecuador, health impact assessment, health diagnosis, development, vector borne diseases, road impact

Environmental Assessment Tiering in Transport Planning - Where Is the Evidence?

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If planning procedures and environmental assessments were conducted in a rational manner, they would most likely be organised in a tiered system, i.e., policies would lead to lower tier plans and programmes and ultimately into concrete projects. Whilst this concept has been advertised by various authors (dating back to Lee and Wood, 1978; see also Hübler et al., 1995), it has remained unclear to what extent a clear tiering structure does in fact exist in reality. Without empirical evidence, SEA tiering is bound to remain a theoretical construct, possibly without any connection with reality.

To date, tiering in impact assessment has received only comparatively little attention. This paper therefore looks at tiering practice for six selected infrastructure projects (road and rail) in Germany and the UK. The relationships of lower and higher tiers of decision making (particularly of environmental impact assessment (EIA) and strategic environmental assessment (SEA)) are described and analysed.

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tiering, SEA, EIA, transport planning

An Ecosystem Approach to Biodiversity Management for Minerals Development.

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This paper investigates biodiversity at the interface of the biological and social arenas. It does so through the guiding principles of the ecosystem approach (EA) as outlined by the secretariat to the Convention on Biological Diversity (CBD). As such, it addresses the conservation, sustainable use and equitable sharing of biodiversity. Like the EA, this paper promotes the use of a holistic systems oriented methodology to address core issues for sustained biodiversity. It does so at numerous levels of the acknowledged biodiversity hierarchy, and from both scientific and social perspectives. Included herein is the link between site-level biodiversity and national action plans or policy. In addition to an understanding of ecosystems, the paper addresses an understanding of people and natural resource relationships as well as land use impacts and technologies. These relationships would ideally be established during the process of baseline data gathering and environmental impact assessment.

A conceptual model for biodiversity management is presented in the context of minerals development. The model is seen as being applicable to many aspects and scales of mining operations, and includes contextualisation with those activities surrounding the focal area. The model framework is derived from systems theory and based on field validated ecosystem and biodiversity issues. It includes the principles of EA and selected biodiversity indicators derived from the literature. Use of the model and potential (sociological) complications to biodiversity management are noted with reference to recent field examples. The author suggests that the systemic inclusion of dynamic social processes with those of the ecosystem, make this approach an effective assessment and management tool.

biodiversity, ecosystem approach, impact, indicators, local community, company

Good Dams - Bad Dams in Latin America: Log-book of an Hydro-Quebec Environmental Advisor

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Privatization of electrical utilities is under process since almost a decade through Latin America. Social and economical stabilization, deregulation of the energetic sector, openness of the electricity market for foreign investors and capitalization needs by Latin American countries catalyzed the privatization of electrical utilities. Over the last five years, Hydro-Québec and its subsidiary, Hydro-Québec International (HQI), participates in dozen of restructuring and privatization process of electrical utilities in

various Latin American countries.

As environmental advisor, I have participated, over the last 4 years, in six due diligence missions required for the privatization processes in five Latin American countries. I have visited more than 30 sites including hydro and thermal power plants, substations, maintenance areas and encampment sites.

We wish to present and discuss our observations about good and bad environmental management practices that we have noted. Some examples will come from our recent subsidiary in Panama (EGE Fortuna). Rare or unusual infrastructures would also be shown. We want to share the positive aspects and the difficulties of making environmental audit in foreign countries. We have learned that the challenges of environmental management are more complex in tropical environment. Interesting exchanges with Latin environmental specialists help us to look in different ways over our proper practices.

IMPORTANT NOTICE : We will respect the confidentiality of the due diligence process. The countries or companies' names that I have audited will not be mentioned excepted for the Hydro-Québec International subsidiary.

Hydro-Québec, environmental audit, environmental due diligence, hydroelectric utilities, thermal utilities, Latin America, environmental practices

How to Determine the Reserved Flow? The Major Issue of Tabaret Hydroelectric Power Plant

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Hydro-Québec is studying the feasibility of building a new hydropower plant on the Kipawa reservoir located in the Temiscaming region (Quebec). The reservoir covers a surface area of 284 km² and has two outlets: the Kipawa river (Laniel dam) and Gordon Brook (Kipawa dam). Dams were built between 1909 and 1911 to control flooding along the Ottawa River. The generating station would be located some 40 km northwest of Témiscaming City, between the two existing outlets. The development would include a 500-metre-long headrace canal, a 130-MW power plant (90-m head) and a tailrace ending in the Temiscamingue Lake. The flooded area (1-km²) would encompass two lakes. This project would reduce significantly the mean annual flow in the two outlets.

The 15-km long Kipawa river is located in a natural

environment. The landscape is characterized by a shoreline covers with mature forests and the presence of 14 rapids. The river is the site of an annual white-water rally. Canoeing, kayaking and trekking activities are also practiced. The river shelters fish populations and spawning grounds.

The 14-km Gordon Brook runs through an urban landscape (4,000 inhabitants). In its first half, the brook is constituted by a chain of lakes surrounded by residential and recreational infrastructures. In the second half, the brook runs through an artificial channel. Water intake for industrial and residential purposes are located on the brook. The brook shelters fish populations and spawning grounds.

We present the methodology applied to determine the reserved flow in each outlet to preserve the aquatic habitats and to maintain the actual uses and values of this environment: recreation and tourism, white-water activities, drinking/industrial-water supply and landscape. The methodology includes, hydrological and wildlife data recollection, water quality and aquatics 1D/2D models, environmental, social and landscape surveys and working sessions with concerned publics.

ecological flow, reserved flow, Hydro-Québec, environmental impact assessment, methodology, hydroelectric power plant, white-water activity, fish habitat

The PUP of Trento: An Italian Case Study of Integrated Planning

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The accountability of environmental issues in different planning and decision-making levels has always met difficulties and perplexities in Italy.

In the past, the urban system has been considered as the only system to plan and manage; more recently environmental planning has been intended as a part of urban planning or as a process to identify the natural resources in "special areas" or the cultural goods to protect. This has generated the Italian's current planning system, characterized by a high level of plan fragmentation, in the establishment of several agencies and legislative requirements to preserve and protect specific environmental components rather than others. We have lost the sense of the "big picture," the concept of the territory as a whole, as a resource and heritage, where the identities, values,

structures, qualities, capacities and vocations must be taken into account in order to better define the conditions for a sound development. The attempt to interpret the behaviour of urban, environmental, regional systems and strategies and actions able to guarantee the development of the human and natural environment in a compatible and sustainable manner, is now becoming a national policy also in Italy.

In Trentino, an autonomous Italian region and province, this interdisciplinary, integrated and complete approach has been translated in the planning and decision-making process, and more in detail in the "Piano Urbanistico Provinciale" (PUP) of Trento. The PUP is an urban, environmental and regional planning tool, and a law as well. It has also a programme and management nature, since the socio-economic development program (Programma di Sviluppo Socio-Economico) has been integrated in the plan. The Piano Urbanistico of Trento aims to identify dynamic strategies and goals, operates choices, provides elements of coordination, indicates compatibilities, establishes priorities, defining the political and functional hierarchy of targets and actions.

integration, sustainable development, urban, environmental and regional planning, Italy

NGO-Government Collaboration for Gender Balanced Development in Southeastern Anatolia, Turkey

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NGOs in Turkey have started shifting their activities from the distribution of goods as charity institutions run by volunteers to more professional organizations run by permanent staff striving for alternatives to traditional development practices in the country. Multi-purpose community centers functioning as women's organizations in Southeastern Anatolia is one such example of an NGO-government cooperation aiming at gender balanced social development in the region through grassroots participation. In the 22 community centers currently active in the region the aim is to develop women's resources and build capacity in order to make them aware of their potentials and

contribute to sustainable human development. These community centers are mostly set up in squatter neighborhoods in cities of Southeastern Anatolia. These migrant communities are formed by families leaving their villages either due to the armed conflict in the region or the lack of infrastructure and facilities in their former rural settlements. Working with women is particularly important in these migrant neighborhoods and communities which have been formed from people with a wide range of differing experiences, interests, and worldviews. The results of a social impact assessment of these community centers reveals the influence of the centers on the local women and their families as the target group as well as the government institutions. Through these women's projects, NGOs as the link between the local community and the government authorities are evaluated.

NGOs, gender balanced social development, community centers, migrant neighborhoods, Turkey

Capacity Building for Trade Impact Assessment: Lessons from the Development of EIA

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The paper examines difficulties in creating capacity in developing countries to undertake impact assessments of trade policy, and possible approaches to overcoming them. The assessment of trade agreements and of related policies can be a highly complex task, involving many different specialist disciplines. In addition to the technical difficulties, many hurdles have to be overcome in order to integrate an effective impact assessment process into policy-formulation and decision-making mechanisms. Difficulties which are in some ways similar, but in other ways different, have been encountered in the development of effective EIA systems in developing countries. Many of the lessons learned from the introduction of EIA systems are directly relevant to building capacity for trade impact assessment, and others are indirectly relevant. The paper reviews EIA capacity building experience, and considers how the lessons learned might be applied within initiatives to build capacity for the impact assessment of trade policy.

trade impacts, world trade, sustainability impact assessment, capacity building, institutional strengthening, developing countries

UNEP's Reference Manual for the Integrated Assessment of Trade-related Policies

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That international trade can have both positive and negative economic, environmental and social effects is not disputed. These effects cross many boundaries from individuals, households, regional and eco-systems, across companies and across industries. Consequently, a more integrated way of examining these effects is needed.

This presentation will provide an overview of two UNEP initiatives in understanding the role of assessments in addressing the negative impacts of trade liberalization and promoting the positive ones. It will present a review of the Reference Manual for the Integrated Assessment of Trade-related Policies and assessment studies.

The Manual has been published as a reference document intended for use by policy makers, practitioners in the developed world and developing countries to conduct integrated assessments of economic, environmental and social impacts of trade policy and trade liberalization.

This presentation will discuss the country assessments and what lessons were learned, and outline the objectives, purpose and elements of the Manual and its central themes on the role of national government's approaches to environmental and trade policy and liberalization. It will also explain the role of meaningful stakeholder participation, the application of appropriate methodologies, the concept of integrated assessment, the objective of "flanking" policies and the principle of "learning by doing" integrated impact assessment.

UNEP's Manual provides the international impact assessment community with a valuable reference resource for integrating environmental and trade policy. The challenge for Impact Assessment professionals is to show the way forward in enhancing capacity by engaging and supporting national actors in project identification, formulation and implementation.

Consequently our session will be drafting a submission to the World Summit (Rio + 10) in Integrated Assessment for

Trade and Sustainable Development, which includes environment, economy and society. Your participation is encouraged and welcome.

Copies of the Manual will be available to participants of the session.

overview, integrated assessment, environment, trade, Manual, case studies

Certifying Green Development: An Incentive-Based Application of Impact-Assessment

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Certifying certain types of economic activities as “green” or sustainable has expanded in the US and abroad to encompass forestry, agriculture, and industrial activities, among others. In these sectors, this provides an economic incentive to undertake these activities in an environmentally sustainable manner through the use of a transparent and systematic process.

In this paper, the authors develop an impact-assessment based methodology for certifying land development as “green” or sustainable. As a starting point, the State of California’s Environmental Quality Act (CEQA) list of environmental factors was adapted and expanded to more explicitly and thoroughly incorporate sustainability criteria. Then a ranking system was developed to determine the conformance of each proposed development with principles of sustainability. This model was applied to an actual case study in the San Francisco Bay area. Strengths and weaknesses of this approach were identified. The value of this approach (the carrot) in promoting sustainable development is addressed and compared with the effectiveness of standard CEQA EIA procedures (the stick) in promoting sustainable development.

sustainability, “green” certification, economic incentives, land development

Case Study: Citizen Values Assessment “Social Impacts of Large Scale Depots for Heavily Contaminated Sediments”

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Citizen Values Assessment (CVA) is a tool to investigate the way in which groups of citizens value the qualities of their living environment and to use this information as one of the sources to judge and compare project alternatives in an Environmental Impact Assessment (EIA). It generates a systematic, objective overview of the values that determine the quality of the living environment from the perception of the affected citizens themselves. This profile of citizens’ values is used to determine possible impacts of future projects.

The CVA study described in this paper was an integral part of an EIA. The EIA concerned a project on finding a structural solution to the heavily contaminated sediments of coastal harbours in the Province of North Holland in the Netherlands. Removing of (heavily contaminated) sediments is necessary to keep the Dutch (sea)ports near the North Sea channel en the western part of the Waddensea accessible for (marine) shipping and because of possible risks for the environment. At present however, there is insufficient capacity for removing and cleaning up of heavily polluted sediments. On several locations solutions are sought by three types of approaches: large scale depots, processing units and measures avoiding pollution. The CVA study revealed the possible impacts of the project alternatives on the quality of the living environment, seen from the perspective of residents, holiday makers and day trippers. The results of the CVA study are not only fully integrated in the final EIA report, but also fulfilled a major role in the communication and public consultation/participation which was part of the EIA process.

citizens values assessment, social impact assessment, SIA-methodology, environmental impact assessment, judging project alternatives on the basis of citizens values, public participation

European Cooperation for Urban Sustainability

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A lot of efforts are being made in different countries in order to achieve more sustainable cities. One of the priorities of the European Union's Fifth Framework Programme is focused on the city of tomorrow and deals with "new models for the sustainable development of European cities." In the early 1990's the European Action COST Urban Civil Engineering was launched, in order to meet the increasing demand for promotion and co-ordination of research related to the complex process of city transformation, viewed from a design standpoint. COST (Co-operation in the Field of Scientific and Technical Research) is a framework and forum for international R&D collaboration, which enables the co-ordination of national research at a international level. COST has a geographical scope beyond the EU and welcomes the participation of interested institutions from non-COST-member states without any geographical restriction. Today its nearly 200 Actions involve some 40000 participating scientists from 32 European member countries and from nearly 50 participating institutions belonging to additional 14 different countries.

This paper focuses on the work and results of COST Action C8, "Best Practice in Sustainable Urban Infrastructure," whose main objective is to develop better solutions for sustainable urban infrastructure by:

- exchanging experience on,
- assessing and developing solutions for,
- comparing and developing methods to assess various solutions for and promoting the diffusion of best practices concerning sustainable urban infrastructure.

The secondary objective is to achieve a common understanding on sustainability and related criteria for decision-making in urban planning and design, as well as to document these results in proceedings, compendiums, books or other publications or websites available to all European countries. The Action will operate for 5 years and involves 16 countries: Austria, Belgium, Canada, Denmark, Slovenia, Finland, France, Germany, Italy, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the UK.

cities, decision-making, sustainability, urban infrastructure

GISability of SEA (Poster)

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To what extent could GIS be a suitable tool for SEA? Strategic Environmental Assessments usually address a large geographical area and capture considerations from various disciplines, integrating ecological, economic and socio-cultural criteria. The data scale and level of detail are reduced. Sustainability indicators and broad concepts are used, such as energy consumption, spatial impacts, atmospheric and noise pollution, cultivable soils loss, etc. Could GIS be used to integrate all of them, providing a direct reference to the spatial context in which they occur? Geographic Information Systems allow modelling, dynamic visualization, up-to-dates, etc. and offer a great capacity of data treatment. Could they be used to integrate the large amount of data of various natures (qualitative and quantitative, graphic and alpha-numeric) that have to be taken into consideration throughout the planning and decision-making process? Could GIS be used as a spatial analysis tool to represent and analyse for example the evolution of complex systems such as cities (spatial development or urban decline) and the effects of human action on the natural environment? This poster tries to give an answer to all these questions and presents some conclusions on the GISability of SEA.

decision-making, geographic information systems, GIS, spatial planning, strategic environmental assessment, SEA

Geographic Information Systems in Environmental Impact Assessment Context – The Colombian Case
 (Poster)

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In Colombia, environmental impacts caused by different activities developed by man produce many detrimental effects on the environment. Environmental assessment is a task that has become important in the country in the last 25 years and is made by different organizations and institutes, being at the present time the Ministry of the Environment, the coordinating axis of the national environmental management.

Throughout that time, multiple policies and regulations at national, regional and local level have been designed, whose fundamental intention is the suitable protection, preservation and handling of the natural resources and as a whole, have allowed to define a coherent operational scheme, that orients the present processes of environmental assessment.

Nevertheless, the frame of construction of the processes of environmental assessment by the government has ignored the use of modern computer science technologies, like the case of the Geographic Information Systems (GIS), basically because of three aspects: the limitations that a transference of opportune technology implies towards countries in transition; the shortage of enabled human resource in these subjects and finally, the high costs that implies to access the technology.

This situation has come correcting gradually in Colombia, in the first place because the government interest of implementing modernization policies result in suitable way to respond the necessities of a country in continuous process of change, and also because of marketing aspects, which have allowed the increasing use of this type of technologies originating a considerable reduction in the price of hardware and software allowing consequently, the access to these tools with its respective programs of qualification.

Since decision making processes and a generation of new knowledge have contributed, GIS has been widely demonstrated as a very useful tool in diverse fields such as academia, research, politics, industry and commerce.

In this sense, the present document has as purpose to show the advances and utilities of GIS as a tool to improve the making decision support process, within the context of environmental impact assessment in Colombia.

geographic information system, environmental impact assessment, Ministry of Environment, Colombia

Oil and Gas Exploration in Dureji Game Reserve, Pakistan - Anticipated and Actual Impacts on Wild Ungulates

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In the summer of 2000, Premier & Shell Pakistan B.V. conducted a seismic survey and drilled an exploratory well in Dureji Game Reserve, Pakistan. Dureji Game Reserve is located in southern Pakistan, and is a semi arid area that supports scattered populations of Afghan urial (wild sheep) and Sindh ibexes (wild goats).

Both the seismic survey and the exploratory well were located in and around core urial and ibex habitat, due to which special mitigation measures were implemented to reduce project impacts on wildlife. The projects also included regular monitoring of wildlife behavior and distribution, which was compared with baseline information collected earlier to assess the actual impacts of the oil and gas exploration activities.

Mitigation measures for the seismic survey included the use of portable equipment that could be transported by people or camels, so that constructing new access roads was not necessary, and strict personnel management (limiting the number of people, their movement, the areas they were allowed to work in, the duration that they could work, etc.) when working inside the core zone.

The main mitigation measure for the exploratory well was the implementation of a range management program (RMP). The objective of the RMP was to reduce grazing pressure in the area by stall feeding domestic goats, thereby improving conditions for wild ungulates, and compensating for the disturbance caused by the drilling.

Wildlife monitoring results showed that the actual impacts of the seismic survey and exploratory well on wild ungulates were lower than those predicted in the project environmental impact assessments.

This paper describes and discusses the seismic and drilling projects, the measures taken to mitigate project impacts on wildlife, wildlife monitoring methodology, and the results of the wildlife monitoring programs.

oil and gas exploration, impact assessment, wild ungulates, urial, ibex, wildlife monitoring, range management

Health and Environment in Sustainable Development in Bahrain (Poster)

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The project "Health and Environment in Sustainable Development in Bahrain" is being implemented in partnership between a national team of the government of Bahrain, an international team from IMPACT – the international health impact assessment consortium at the University Liverpool and the United Nations Development Programme.

The state of Bahrain is a small – mainly urban – island state with limited land and depleted oil and gas resources. The country has embarked on economic diversification led by the industrial sector. Land reclamation, waste dumping and pollution caused by industrial expansion and the effect of the recent two gulf wars are causing serious environmental health and other hazards. This interface between development, environment and health is taking place against an already complex health situation.

Bahrain is a country in transition from a traditional pattern of morbidity and mortality to an industrialised pattern. The country is afflicted by both types of health hazards, the traditional communicable diseases, and the typical health hazards of an industrialised country such as non-communicable diseases, over-nutrition, injuries and psychosocial disorders.

The government has recently recognised that sustainable development of the country can only be ensured if the full range of potential impacts of development projects are assessed in a timely fashion and action proceeds from that assessment. However, to date no comprehensive environmental health impact assessments have been undertaken. This is mainly due to the limited capacity of the Government authorities and other relevant institutions. The project objective is the institutionalisation of environmental health impact assessment as a tool of environmental policy and a planning tool for sustainable development.

The project will seek to integrate health, environment, social and economic impact assessment methods and procedures. Nationals will receive in-country and overseas training in this powerful new discipline using hands-on and inter-disciplinary task-based methods.

The ultimate development aim of the project is to develop national self-reliance in Bahrain on all matters related to protection and management of the physical and social

environment in order to protect and enhance human health.

health, environment, Bahrain

Assessment of the Environmental and Social Impacts of the West Siberian Oil Industry

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An environmental and social assessment of the impacts of the oil industry in West Siberia was the original wish of Greenpeace. Greenpeace required an independent assessment to support their scientific field trips to West Siberia in the summer of 2000 as part of a campaign targeted at the Russian oil industry. IWACO B.V. Consultants for Water and Environment was commissioned to provide independent scientific data to support the Greenpeace campaign. The vast geographic scale and sheer size of the oil sector's activities however called for a more scoped task. The result was a strategic Environmental and Social Profile, based on environmental impact assessment principles. The project provides a tantalising glimpse of the impacts of the oil sector on the physical and social environment in West Siberia.

The proposed paper will first introduce the project and project activities, which included a definition and scoping of the project area, narrowing down of the geographic area to the oldest oil producing region of Nizenvartovsk and discussion of possibilities for extrapolating the findings to West Siberia. The scope was also affected by the particular demands of the client, including the entirely NGO funded budget, access to the region and industry and authorities. This in turn influenced the approach, which aimed to be as scientifically rigorous and independent given the scale, scope and budget. The paper will introduce the novel approach which included conducting an oil industry and environmental and social baseline, hazard assessment and sensitivity analysis, determination of key environmental and social issues following an interactive priority ranking with Greenpeace, data gathering by literature review, interviews, remote sensing and fieldwork, impact assessment and development of proposals for environmental management and mitigation measures and reporting. The paper will discuss and justify the activities that produced the Profile: a literature review and desk study; Remote sensing analysis;

Fieldwork and sampling; Fact finding missions and interviews; Chemical analysis of samples, with the output a series of reports.

The paper will present a summary of the West Siberia physical and social environment and oil industry, the initial assessment of potential environmental and social impacts and the final social and environmental assessment. A number of practical, but possibly controversial potential environmental management measures for the impacts were proposed – these will be outlined in the paper. The reactions of a number of stakeholders to the project: the oil sector, Russian governmental authorities, NGOs and international financing institutes will be discussed.

oil industry, environmental and social assessment, West Siberia

The Analytical Strategic Environmental Assessment (ANSEA) Project

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The Analytical Strategic Environmental Assessment (ANSEA) project is a research financed under the 5th Framework Research Programme of the European Union. The overall objective of ANSEA is to develop an approach and framework for SEA that ensures a sound integration of the environment into decision-making processes. Current practice of SEA is often based on modified environmental impact assessment (EIA) procedures and methods. EIA focuses on the “objective” identification, prediction and evaluation of environmental impacts of concrete development options. However, in the case of PPPs, we suggest that the environmental assessment procedure must go far beyond the analysis of the environmental impacts: it should also influence the process and content of priorities, issues and values in decision-making.

Placing the decision-making process as the departure point is suggested to be the appropriate way to define a consistent object of study for SEA. This approach requires a conceptual framework based on decision theory, which involves the systematic analysis of decision processes. The project can be summarised in four steps.

1. The partners involved in the project will consolidate and formalise the conceptual elements of a SEA based on an analytical framework.
2. The ANSEA concept is applied/tested to case studies in four policy areas (transport, urban development, Forestry and energy) in five EU countries (Germany, UK, the Netherlands, Spain and Sweden). At the same

- time, a review of existing experiences in SEA of policies, plans and programmes (PPP) will be carried out in two additional member states (Italy and Portugal).
3. The theoretical basis for ANSEA is revised and finalized and the design of a methodological framework for its practical application is developed, based on the results of the case studies.
4. The results will be disseminated through a European symposium, two books and a web page.

strategic environmental assessment, environmental assessment

Analytical Strategic Environmental Assessment of Santiago de Chile Urban Transport Plan

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The National Environment Commission (CONAMA) of the Metropolitan Region of Chile asked TAU Consultora Ambiental (Spain) to elaborate a strategic environmental assessment methodology of urban transport planning in the city of Santiago de Chile. TAU elaborated a proposal on the concept of an analytical strategic environmental assessment (ANSEA), based on a simple idea: the environmental assessment of a strategic decision which has the objective of obtaining the adequate incorporation of ALL the environmental considerations relevant in the decision, without limiting itself to its possible environmental effects, which are nearly impossible to identify in this case. The methodology incorporated the following elements:

- Identification of the basic environmental decisional considerations to be borne in mind in the planning of urban transport.
- Detailed functional hierarchical description of the planning process.
- Identification of decisional domains in the functional hierarchical description having an environmental relevancy (environmental decision domain).
- Specific allocation and description of the decisional environmental considerations to the single environmental decision domain.
- Analysis of the effective incorporation of the environmental considerations in the environmental decision domain in the actual urban transport plan.

Main results

- ANSEA endorsed the precise identification of the environmental considerations that the transport plan had inadequately incorporated, which were approximately a hundred. The assessment identified

precisely the environmental decision domains where those environmental inconsistency were located.

- Definition of an *ad-hoc* SEA institutional procedure for the urban transport plan which could be applied in the future.
- Design of a strategic environmental assessment follow-up programme for the execution phase of the plan.
- Characterisation of the planning process and its relation with environmental shortages.
- Production of strong arguments for CONAMA in its dialogue with the Transport Secretary (SECTRA), which will apply the ANSEA approach in its next programme.

strategic environmental assessment, environmental assessment

Development of Environmental Impact Assessment Training Programmes at the University of Debrecen (Hungary) from Undergraduate Level to M.Sc. Diploma Course – A Tool for the Enhancement of European Union Pre-accession Process

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Hungary makes significant efforts for the European Union (EU) accession and early implementation of *Acquis Communautaire*. One of the most sensitive areas for the pre-accession process is the environment. Both the pre-accession process and EU membership requires significant human resources development. Well-trained civil servants and experts who are aware of the international practice and able to apply the acquired skills directly are needed. The need for these experts is already high, and the University of Debrecen (Hungary) is willing to meet this challenge by developing and launching a training program in this field. Special significance is given to EIA as one effective tool for the implementation of the environmental policy.

Starting from the early undergraduate training, a rapid and effective development happened in this field. One element is the integration of an EIA module into the Environmental Management and Policy course (module based, one-year, full-time M.Sc. program, run in English in Pan-European co-operation). The Environmental Impact Assessment Management postgraduate diploma course has been developed and was already launched in the 2000/2001 academic year.

Graduates of the Environmental Impact Assessment Management part-time course will be able to coordinate EIA

report development and undertake given tasks within the process.

The necessity for the training is also underlined by the fact that a new EIA Act – harmonizing with relevant EU regulations and Espoo conventions – just recently came into force in Hungary.

development of environmental impact assessment training programme, University of Debrecen Hungary, EIA diploma course, EIA and EU pre-accession process

Strategic Environmental Assessment (SEA) in Korea

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In Korea, Environmental Agreement System (EAS) has been introduced to achieve environmentally sustainable development since the early 1980s. This EAS has been incorporated with decision-making process by considering the environmental impacts of the development activities and recently divided into two systems of Environmental Impact Assessment (EIA) and Environmental Review (ER) in Korea.

EIA in Korea has contributed to make the developers and decision-makers understand the importance of the environmental aspects for sustainable developments. However, there have been discussions that EIA in Korea has a passive tendency due to its limited applicability only to the individual development projects. In order to overcome this deficiency of EIA system in Korea, an ER system which is similar to Strategic Environmental Assessment (SEA) was introduced in 1993. The major purpose of the Korean ER system is to implement the environmental considerations at the level of Policy, Planning and Programme. However, it does not play an important role because there is neither supplementary regulations nor laws to impose the developers to fulfil the pre-agreed environmental considerations. Hence the current Korean ER is considered as a part of an administrative procedure in the development approval process, not as a pre-development agreement system.

An effort to secure the effectiveness and implementation of the ER system was reflected in the amendment of "Framework Act on Environmental Policy" in December 1999. Although the basic law has been amended in favour of the ER system, it is not quite effective than was expected because there still are such problems as limited range of development plans where the system can be applied, many

exemptions, lack of regulations and laws subsidizing the ER system, and lack of public participation.

Consequently, various efforts are necessary to improve the Korean ER system and it will take a long period of time to settle down the system. Meanwhile, the priority can be given to the modifications of ER process and regulations for the subjected development plans. The ER procedure should be modified for the inclusion of various types of public and stake holders' participation at each stage. The regulations should be modified in a way that the Korean ER system can be widely applied to development policies and plans, such as the national 5-year development plan and national land use plan.

Korea, environmental impact assessment, environmental review, strategic environmental assessment

Including Biodiversity in Impact Assessment - Can We Include That Which We Don't Know?

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At the species level of biodiversity, it is estimated that we currently have described and know as little as ten per cent of the organisms which inhabit the planet. By and large those which have been described are the larger plants and animals, those which can be described as the "users" or "beneficiaries" of ecosystem services or which are ultimately impacted on. The smaller and micro-organisms which make up the remaining 90%, which perform such beneficial ecosystem services as pollination, nutrient cycling, and soil generation and propagate such deleterious impacts as disease transmission and parasitism, are relatively unknown, undiscovered and undescribed.

At the current rates of discovery and the estimated rates of species loss, we are losing species far faster than we are getting to know of their existence, let alone their roles, interrelationships and functions. Unless significant steps are taken to rectify this imbalance as well as to slow the rates of loss, we are unlikely to be able to adequately include biodiversity in impact assessment other than as a general estimate of species loss. A massive injection of resources into taxonomic capacity building globally is required as part of this redress. Taxonomy is the basis of all biology, of all that is known about organisms and thus of biodiversity impact assessment. Without taxonomy, no knowledge is available on living organisms - and if you don't know what you have,

you cannot determine what the impacts are, or implement preventative or mitigative actions during "development."

biodiversity, species loss, numbers of species, taxonomy, conservation

EIA Follow-up - Experiences within an Norwegian Energy Company

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The paper will describe briefly the legal basis for EIA follow-up in the Norwegian legislation (Plan and Building Act and Petroleum Act). The paper will also describe the conclusions from a seminar in Norway about EIA Follow-up which will be held in March and where national authorities, researchers and EIA practitioners will participate. Further it will describe some experiences and findings of how EIA follow-up is practiced within Statoil (international energy/oil and gas-company in Norway). This description will partly be based on findings from two case studies within the company in 2000 (a gas pipeline and an offshore field development) where observed practice is compared with criterias for good practice for EIA follow-up - and partly on general EIA experiences over the last decade within the company that included reviews conducted by national environmental authorities.

EIA follow-up is probably one of the weakest parts of the EIA process and is expected to be more focused in the future. Good environmental practice is expected to be more important for commercial companies and good procedures for EIA follow-up are regarded as essential in this context. Based on these acknowledgments and the findings in the case studies, experience within Statoil and the conclusions from the Norwegian seminar, proposals for improving the practice of EIA follow-up will be suggested.

EIA follow-up, projects, industry/energy company

Application of Risk Analysis Methods to Two Alternatives of a Large-scale Wastewater Disposal Scheme in Hong Kong

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Large-scale wastewater collection and treatment works constitute extremely complex systems, involving mechanical/physical, biological, environmental, and human factors. Modern wastewater systems often require advanced treatment at a very high technical reliability and hence the application of modern process-control techniques. This in turn requires more plant components, which increases the failure probability of the system. However, reliability or risk assessments of large wastewater systems have rarely been carried out in connection with environmental impact evaluation, although successful risk identification, evaluation, and analysis would lead to higher system reliability, thereby contributing to a higher effluent quality and improved water environment.

In this paper, important factors influencing system reliability were identified and mathematical formulations for quantifying reliability and risk in wastewater systems are presented. A rational, semi-quantitative methodology was established for the determination of comparative environmental risk potentials according to the state of the art. This approach was then applied to two potential alternatives of a large-scale wastewater disposal scheme in Hong Kong in terms of reliability/risk analysis, namely (i) a model centralised system, and (ii) a model decentralised system. Each system was divided into interconnected subsystems, which were individually analysed quantitatively, based on available reliability data from actual wastewater treatment plants. Then the overall environmental risk potential of the two alternatives was determined quantitatively, taking into account hydraulic characteristics and sensitivity of the receiving water bodies in Hong Kong.

The results showed that, contrary to expectation, the centralised system exhibited a higher system reliability than the decentralised system resulting in a lower risk potential to the water environment. The usefulness and limitations of the applied methodology as an integral part of modern decision support systems for large-scale infrastructure development and its environmental risk potential are discussed.

reliability, risk analysis, environmental risk potential, wastewater system, Hong Kong

**Integrating Biodiversity in EIA. An Experiment:
 Ground Water Extraction in a Wetland Area**

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The Netherlands Commission for EIA started implementing the following recommendation by the fifth Conference of Parties of the Convention on Biodiversity. Preparation of guidelines for the integration of biodiversity in EIA. This resulted in a checklist of biodiversity aspects to be studied in EIA, which has been presented at IAIA in Hong Kong. The objective is guidelines for the integration of biodiversity in EIA in the Netherlands. The checklist will provide the primary information.

Further development of the checklist / guidelines will be done by way of testing a number of EIA studies. For testing the following project has been selected: extraction of 3.0 million m³ ground water in an area adjacent to an international and national protected wetland (Ramsar site). In this EIA, different site and capacity alternatives and their impacts on biodiversity will be assessed and compared. Testing is limited to the first phase of the EIA procedure, the preparation of guidelines for the EIA study.

Lessons learned: (i) Ecosystem as starting point; links between impacts on the abiotic and the biotic environment should become clear by preparing an impact tree. Determination of the use and non use values of the ecosystem / biodiversity needs further study; (ii) With regard to the impact on species and their habitats it has been concluded that only protected species should be considered as a number of species of this group can be identified as indicators for non-protected species; (iii) Only plant communities which are affected will be considered. In particular the value of the affected surface should be determined in order to make a comparison of the impacts of the different alternatives possible; (iv) In national decrees on protection of species and habitats it is mentioned that significant impacts should be studied. It needs further study what is meant by "significant."

biodiversity, EIA, guidelines

**Eco-physiographic Elaboration -- Environmental
 Foundation of Planning of Land Development in Poland**

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A new act called Environmental Protection Law will take effect Poland on 1 July 2001. It will replace the current act in force on protection and shaping of the environment, from

1980. Solutions in the new act were adjusted to the ones binding in the countries of the European Union.

In some cases, as for example in land development planning, the solutions are different and they reflect Polish experience and in substantially more effective way allow for using procedures of drawing up, consulting and agreeing of master plans as the procedures that make the idea of balanced development real.

Eco-physiographic solution is a document that is characterised by individual elements of the natural environment and mutual correlation of these elements. It is drawn up in advance, i.e., prior to the commencement of planning works and is to serve to take into account the environmental conditions in forming a land development design.

Therefore, the eco-physiographic elaboration will be used in the very initial phase of the concept formation, i.e. functional and spatial structure of the defined area. Although it is a planning process, individual [subjective] decisions on the land use are taken at this stage. Although due to the planning solutions these are not formal decisions, i.e., the decisions taken on the basis of the administrative law regulations, their subsequent results have substantial meaning. The Minister of Environmental Protection and Natural Resources got a statutory obligation to issue the ordinance defining kinds and a scope of the eco-physiographic elaboration.

The eco-physiographic elaboration may be used as a basic or problematic elaboration. The basic elaboration is drawn up for all three types of the planning elaboration in the field of the land development, however, the problematic elaboration is drawn up if additional problems requiring recognition are revealed during the planning works.

The eco-physiographic elaboration should include complete information on the environment and its functioning and make the basis for forming of the environmental objectives in the planning elaboration in the field of land development and defining of the land development conditions that result from the environment features. This paper includes the scope of eco-physiographic elaboration.

In order to ensure the same level of information particularity for the needs of planning elaboration, it was agreed that the eco-physiographic elaboration should be drawn up in the same scale as the planning elaboration.

land development, eco-physiographic elaboration

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The system of master plans in Poland is regulated by the act on the land development. A master plan is drawn up for the area of municipality or its part or a complex of municipalities or its part. The master plan drawn up for the municipality area constitutes a municipality regulation and a voivodship area, is based on the act on Geological and Mining Law envisaged for mining areas, and is drawn up in regard to the whole country. In

relation to these concepts, there is an obligation to carry out a proceeding concerning the environmental effect assessment, including changes introduced to these documents.

Although in the case of drawing up of concepts of changes in policies, strategies, plans or programs other than projects concerning the land development planning, the obligation to carry out the proceeding in the environmental effect assessment regards each master plan as well as all of its changes.

According to the act on access to information on environment, its protection and the environmental effect assessments, a public administration institution that draws up the concept of master plan or introduces changes in the already agreed and binding master plan prepares the environmental effect forecast, i.e., a report on the strategic assessment of the effect.

The public administration institution that draws up the master plan or introduces the changes in the already agreed plan provides the master plan along with the environmental effect forecast for the proceeding with the society participation and assessment by the public administration institutions.

Prior to the agreement of the master plan or its changes, the public administration institution provides to the public the information on possibility of submitting of remarks and motions within 21 days from making it public, at the same time indicating the place of submission of the remarks. Consideration of the submitted remarks and motions is the institution's obligation.

Nevertheless, the act on access to information on environment, its protection and the environmental effect assessments introduces a new format for making information public – by means of putting the information on the Internet site of the institution proper for accepting [agreeing] on the local master plan if the institution has such Internet site.

SEA, spatial planning

The Scope of the Report on Strategic Assessment of Environmental Effects on Land Development Planning

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The strategic assessment of the environmental effect on the land development planning was called the environmental effect forecast.

The scope of the report on strategic effect assessment, which is carried out during the process of drawing up and agreeing of master plans, is defined in the special ordinance by the Minister of Environment and Natural Resources from the year 2001 on particular conditions which forecast environmental effects of the local master plans' concepts.

According to the provisions of the above mentioned ordinance, the following elements should be defined and assessed in the report on the strategic assessment of the effect:

1. results of effect of implementation of the arrangements of the local master plan concept on the elements of natural and cultural environment, and in particular on people, air, ground surface including soil, mined minerals and surface and ground waters as well as material goods and cultural heritage;
2. environmental effects that may result from the envisaged use of the area in connection with introduction of substance or energy, operation, carrying out of earthworks, change of water relations, change of environmental structure, land reclamation, as well as introduction of species that are strange to local flora and fauna and a risk of occurrence of extraordinary hazards to the environment.

It should be stressed that not only natural environment but also cultural environment, i.e. cultural heritage and material goods are covered by the scope of the forecast. It is substantial extension of the scope in relation to the one that was established in the previous ordinance in force of the Minister of Environment and Natural Resources coming from the year 1995.

The Report drawn up in the proceedings concerning the assessment of the effect on environment of local master plans should include the following assessment:

- functional and spatial solutions and other arrangements included in the local master plan concept from the point of view of the environment condition and functioning, its sensitivity / resistance to deterioration, ability to regeneration, its values and resources defined in the eco-physiographic elaboration;
- functional and spatial solutions and other arrangements included in the concept of the local master plan from the point of view of the cultural environment values and protection of the existing material goods;
- solutions eliminating or limiting negative influences on the environment that may result from realisation of the arrangements included in the concept of the local master plan as well as the effects in the case of giving up the planned arrangements;

- effectiveness of the protection of flora diversity in the local master plan concept;
- the proposed particular conditions in the local master plan concept that result from the necessity of environmental protection, appropriate management of natural resources and protection of farming and forest soils;
- effects that may occur as a result of realisation of the arrangements of the local master plan in the existing and the envisaged protective areas;
- compliance of the arrangements included in the local master plan concept with regulations on the environmental protection including regulations from the acts on establishing of protective areas and buildings and protection plans;
- compliance of the planned land development with the local eco-physiographic conditions;
- potential trans-border effects.

The natural environment is treated as a compact system through underling of the requirement of the analysis of individual environmental elements in their mutual correlation, and therefore, this way of analysing the effects in the proceedings concerning the assessment of the effect on the environment of the local master plans is more adequate to reality and ensures greater efficiency of the forecasts.

SEA, spatial planning

Health Impact Assessment: Where to Next

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The linkages between environmental degradation and human health are emerging consistently as priorities for developed and developing countries. There is a growing understanding that the environment is a major determinant of human health and, conversely, that human health is a

key driver for action, on the environment.

Recognizing that achieving sustainable development on the national and international scenes requires addressing in an integrated manner, the close interconnection between human health and environmental degradation, Health Canada, together with a federal, provincial, territorial committee have developed a three volume Canadian Handbook on Health Impact Assessment outlining a common approach to assess the impacts of development projects on humans. Public consultations on the Handbook have clearly identified a need for mechanisms to provide practical training nationally and internationally to Health Impact Assessment/Environmental Impact Assessment practitioners. This paper will outline efforts within Canada to provide this training.

As well, a number of international activities (Meeting of Americas Ministers of the Environment, G8 Ministers' Meeting, the Rio+ 10 Summit, plus others) are planned over the next two years which are of significant interest to HIA practitioners. Details will be provided on Canada's efforts to engage in dialogue on the theme of health and environment with stakeholders to develop a robust health and environment agenda/position at these crucial meetings.

Offshore EIA and Compliance Monitoring in a Sensitive Region – Gulf of Guayaquil, Ecuador

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It is a well-accepted fact that the Gulf of Guayaquil, Ecuador, is both a productive and highly sensitive environment of exceptional species biodiversity. Following this understanding, a full EIA was conducted in the Gulf for

Ecuador's first offshore natural gas facility. As this project represented the first for offshore Ecuador, a thorough scoping process was necessary between the operator, regulatory body and key stakeholders to define specific articles and discharge limits for offshore operations. Preliminary discharge limitations were developed based on existing discharge limits in the region including the Environmental Regulation for Hydrocarbon Operations in Ecuador, and Venezuelan discharge limits, and also incorporated international limits including USA, Canada and the UK. The EIA forecast changes that may occur in the marine environment, and demanded a baseline understanding of the natural driving forces in the Gulf of Guayaquil. The process incorporated an intensive field programme, social assessment and a focus on the valued ecological components in the region including artisanal and commercial fishing, and the potential impacts to sensitive areas such as the island of Santa Clara. The Gulf of Guayaquil is in direct continuity with the eastern Pacific and is subject to varying oceanic phenomena including the El Niño Southern Oscillation. To ensure the sustainability of this project, a range of studies were carried out during El Niño and La Niña years to determine a baseline of criteria from which an appropriate compliance monitoring programme could be based.

marine assessment, sensitive area, offshore oil and gas, EIA, social assessment, compliance monitoring

Sustainability Impact Assessment of International Trade Agreements: an Emerging Tool of Strategic Appraisal

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Proposals for new trade agreements, international and regional, generate a great deal of controversy because of concern over their potentially significant economic, environmental and social consequences. This fact, combined with the growing commitment to sustainable development, has increased pressure to undertake

sustainability impact assessments (SIA) of both existing trade agreements and proposed new agreements.

During the second half of 1999, the Institute for

Development Policy and Management (IDPM) at the University of Manchester undertook, for the European Commission, a preliminary SIA of the proposed New Round of WTO trade negotiations (the Millennium Round). Its main purpose was to inform negotiators and other interested parties of the potentially significant sustainability impacts from such an agreement, which could require parallel flanking and other measures to correct where these were negative

This paper is based on the findings of that study and of subsequent work on the SIA of international and regional trade agreements. The main issues addressed are:

- What are the principal requirements of preliminary SIAs and the resulting findings relevant to the preliminary stages of negotiations of a Millennium Round?
- How should preliminary SIA methods be elaborated for use in the later, more detailed, stages of trade negotiations?
- How can SIAs contribute to the identification and appraisal of flanking measures, enhance the prospects of "win-win" outcomes and reduce the concerns and controversies surrounding trade negotiations?
- What are the key areas in which SIA methodology and its application need to be strengthened?

The SIA of trade agreements provides a striking illustration of attempts to extend environmental assessment to the global level of appraisal and to integrate this with strategic forms of economic and social appraisal. It raises important questions about SIA which apply well beyond trade reform appraisal.

world trade, trade agreements, sustainability impact assessment, methodology, flanking measures

Agricultural Processing Plants: Impacts for Rural Communities

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Expanded processing of agricultural products in rural areas has been widely pursued as a strategy for community economic development. In recent years, a substantial number of rural communities in the western Corn Belt and northern Great Plains have succeeded in developing or attracting new agricultural processing facilities. Expansion of value-added agricultural processing in rural areas is generally seen as a positive development; however, this expansion has not been without its problems. The objective of this study was to gain a better understanding of the socioeconomic impact of new agricultural processing plants.

Several alternative hypotheses about the impacts of agricultural processing plants on rural communities are evaluated through primary data collected from community leaders, company officials, and area residents in several North Dakota towns that are the sites of new agricultural processing facilities, as well as secondary data from a variety of courses. The communities studied had populations ranging from about 1,500 to 15,000 and each was the site of an agricultural processing plant developed during the 1990s. The plants represented a variety of processing activities and included a slaughter plant, a corn wet milling facility, a frozen french fry producer, and a pasta plant. Their initial investment ranged from \$1.6 million to \$260 million, while their employment at the time of the study ranged from 46 to 274 workers. Study results indicated that improved job opportunities and enhanced incomes were generally seen as major positive effects of each of the new processing plants. Residents' incomes were enhanced both by the plants' job and payroll (which often represented second incomes for area households) and by increased incomes for area farmers (either from dividends paid directly by the processing plants, or from higher prices for a crop already being produced, or by allowing producers to raise a commodity that previously had no viable market). Because most of the plant jobs were taken by persons already living in the area, the new plants did not lead to substantial immigration or major population growth in the host communities, but rather served to stabilize the local economy (or to slow the rate of decline). Of all the effects of the plants, only air quality and water quality were more often rated as negative than positive by local residents. However, interviews with community leaders indicated that even these effects did not constitute major problems or issues.

rural industry, manufacturing, food processing, socioeconomic impacts

Wetland Restoration to Reduce Flood Damage in the Red River of the North, USA

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The economic feasibility of alternative wetland restoration activities to store runoff water to reduce flood damage was evaluated in two subwatersheds of the Red River of the North (USA) watershed. Evaluation used data from recent hydrologic modeling and wetland restoration studies, the National Wetland Inventory, local land rental values, and site-specific historical flood damage. Neither simple wetland restoration based on plugging existing drains, restoration with controlled outlets, nor complete ecological restoration were found to be economically feasible. Inclusion of additional non-market wetland values in the analyses is not likely to tip the balance in favor of restoration, due largely to the abundance of wetlands and low human population density in the watershed.

wetlands, Red River of the North, flooding, restoration, North America, flood damage mitigation

Preparing for Another Flood of the Century in the Red River of the North, USA

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A major flood in 1997 disrupted the lives of over 100,000 people for several months and resulted in economic damage in the United States and Canada of over US\$5 billion. The City of Winnipeg, Manitoba, came within centimeters of far more serious flood damage. Red River of the North watershed residents on both sides of the USA-Canada international border met the challenge of that flood, but asked for government to analyze the root causes of the flood and to recommend mechanisms to mitigate potential damages from major floods in the future. Canadian Prime Minister Chretien and U.S. President Clinton asked The International Joint Commission to do the study and make recommendations. The IJC issued its report (Living with the Red) in late 2000, wherein it makes several observations and recommendations, such as: an even greater flood could occur; people, property, and the floodplain ecosystem will be at risk until binational solutions are developed; there is no single solution; major population centers need immediate attention; and governments at all levels need to promote a culture of flood preparedness.

flooding, transboundary cooperation, USA-Canada, Red River of the North, flood damage mitigation, flood of 1997

EIA as a Tool for Knowledge Generation in Similar Subsequent Projects

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One of the most important functions of EIA is to get hold of and present knowledge about the specific cause-and-effect relationships in order to improve decisions regarding conditions for project approval. In many cases knowledge about cause-and-effect relationships is not easily obtainable and requires comprehensive research, investigations or experimentation. This type of knowledge generation does, however, often demand more time and funds than the preparation of a single EIA can contribute with. A group of similar subsequent projects does increase the possibility of more thorough knowledge generation.

This paper analyses and describes the development of EIA as knowledge generator in several reoccurring issues in subsequent projects. The focus is attached to variations between different kinds of issues regarding EIA as a knowledge generator. One of the findings is that EIA has been more successful as knowledge generator in professional issues than in political issues. Variations between issues subject to regulation and issues with conflicting or diffuse goals have also been examined.

EIAs function in bringing knowledge about cause-and-effect relationship affects in a broader context EIA as a tool for management, monitoring and auditing. Variations between different kinds of issues regarding management, monitoring and auditing are also illustrated.

In total, 45 EIAs of plans for the development and operation of petroleum fields and pipelines on the Norwegian continental shelf, during the period 1985-1997 constitute the empirical basis. The development of knowledge about cause-and-effect with respect to five issues reoccurring in most of these EIAs has been analysed. These issues are (1) restriction-zones for the fisheries, (2) negative impacts on trawling caused by pipelines, (3) discharges to sea, (4) emission of CO₂ and NO_x and (5) the localisation of operating organisations and bases.

EIA, knowledge generation, auditing, petroleum, Norway

Environmental Assessment Applications in Large Oil & Gas Onshore Development Projects

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The Challenge

- Developing a large oil and gas development project in a beautiful and sensitive environment. The rough topography, the presence of important watercourses and some forested areas plus the presence of human settlements are some of the conditions that characterise the Casanare foothills in Colombia. These added to the special geological conditions pose extreme challenges to the drilling operations and the reservoir development.
- The development of Cusiana and Cupiagua has required the construction of more than 50 wellsites, 150 Km of new access roads and 250 Km of buried pipelines.
- Difficult access conditions have restricted our ability to acquire field information required for studies and designs.
- During the project's development Colombia has experienced a significant and continuous evolution in its environmental regulatory and institutional framework.

Our Approach

- These conditions on top of a commitment to apply high environmental standards have demanded the implementation of innovative environmental and project planning processes. They required the introduction of changes in the way decisions were made and great innovations both in the way key information was gathered and in the application of planning tools like environmental assessments at early stages.
- They also required the incorporation of several technological advancements: the implementation of a Geographical Information System (GIS) with satellite, radar and aerial photographs, thematic mapping of the environmental conditions and the location of the infrastructure; 3D surface and subsurface model visualization; videoconferencing & application sharing between the central office and field remote stations; and the use of data bases for storing and sharing documents, studies, designs, permits and licences.

EIA, oil & gas projects, large scale projects, GIS

EIA Serving Urban Sustainability: Czech Experience

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The project "Sustainability of Human Settlements," which the author has been responsible for, progressed into the stage of completion recently, as a part of a major UNDP Programme "Towards Sustainability in Czech Republic." The paper to be presented draws upon this project's outcomes, particularly in terms of criteria and indicators applicable for EIA and SEA.

The potential "pool" of criteria has been found very extensive. More than six hundred "elementary" criteria have been defined. They form selection framework for scoping in a major assessment procedure. A substantial first part of this pool has been made up by the criteria reflecting the state of environment in terms of its immediate impact on human health and physical condition in general (e.g., air pollution and emission parameters; water contamination of human origin etc.

The second part of the stock cumulates criteria connected with purely ecological constituents of urban structures (e.g., vegetation coverage and greenery, local, regional and superregional systems of ecological stability, etc.).

The remaining third part of the pool groups criteria that may be defined as physical constituents of urban environment resulting from human activities and representing at the same time selection of values considered to be permanent provision of urban life – with respect to the sense of communities' evolution. Into this category, the criteria include presence of aesthetically valuable elements, provision of public spaces making possible human contact, occurrence of visual intrusion, quality of perspectives, horizons, and silhouettes; many others should be included.

Diversity of urban areas calls for the adjustment of EIA to particular urban settings. Localisation of establishments and activities in cities brings up growing need to balance interests of various subjects, which EIA has to reflect.

EIA, scoping, urban environment, health, ecosystems, urban studies

Routeing and EIA for Overhead Transmission Lines

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High voltage, high capacity overhead lines are the economic and reliable choice for the bulk transmission of electricity throughout the world. The routeing of transmission lines is a complex process, and in the UK requires a balance to be struck between statutory obligations, engineering requirements, economic viability, land use and the environment. Transmission line routeing projects can rightly generate considerable public interest and debate, but are often focused on local issues such as visual amenity rather than the wider benefits of the project to society as a whole. Given the extent of their public and regulatory scrutiny, the Environmental Statements of such schemes must be objective and transparent in the approach adopted to the routeing strategy.

This paper sets out an explanation of ScottishPower's approach to the routeing and EIA of overhead transmission lines. The approach is based on the premise that the major effect of an overhead transmission line is visual and the degree of visual intrusion can be reduced through careful routeing. In addition, a well-routed line takes into account other environmental and technical considerations and will avoid, wherever possible, the most sensitive and valued natural and man-made features.

EIA, routeing, mitigation, energy industry, overhead transmission lines

A New Challenge for Industry: Integrating EIA within Operational EMS

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The ability of Environmental Impact Assessment (EIA) and Environmental Management Systems (EMS), such as BS EN ISO 14001, to promote better environmental performance is dependent on the capability and commitment of its practitioners. In the absence of commitment and resources they become theoretical tools turning environmental action into rhetoric and mere window dressing. Increasingly, EMS are providing a backbone to the construction, operation, maintenance and

management of new facilities and structures from their initial stages of development planning through to commercial operation. This article seeks to outline the experiences of a group of environmental practitioners within the energy industry as they attempt to move existing EIA processes into active EMS.

EMS, EIA, ISO14001, energy industry, environmental performance

Mitigation Linkage - EIA Follow up Through the Application of Environmental Management Plans in Transmission Construction Projects

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EIA is an anticipatory risk assessment process effective in assisting Decision Making Bodies to identify the significant adverse impacts of new developments prior to granting consent. Whilst viewed primarily as a decision-making tool for the regulator, its role in facilitating development practice is often overlooked. For many new developments, EIA acts as an important pre-construction planning exercise in which design attributes, site and routeing strategy and mitigation concepts are closely examined prior to finalised design and project costing. When moving out of the consenting process into the formal construction stage, it is thus important that the design commitments that mitigated environmental effect and assisted in the gaining of consent are carried through into practice. In ScottishPower's electrical transmission and distribution business, increased use of environmental management plans (EMP) has been adopted as the controlling strategy to link EIA into the company's ISO 14001 Environmental Management Systems. EMPs have been used as a tool to ensure mitigation linkage to construction project, to set audit programmes for contractors, and as management controls to ensure consent conditions are complied with. This paper seeks to outline recent experience in the planning and construction of new overhead electrical transmission lines and substations within the UK.

follow up, EIA, EMS, energy industry, environmental management plans

EIA of the Nuclear Power Plant Temelin – Background, Methods, Experience

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A very particular case has been taking place in the Czech Republic in the last months. A nuclear power plant has been constructed at Temelin in South Bohemia during the past tow decades. Based on a certain legal construction, the current valid Czech legal arrangement from 1992 did not apply to this construction. At the moment when the construction of the first of the two 1,000 MW reactors was finished and the testing operation of the reactor with the turbine was commissioned (the second reactor with a turbine is just being finished) a non-formal "screening" of the construction was held and on an agreement of the Prime Ministers of Austria and the Czechia and with the assistance of EC Commissioner the Czech party decided to perform an EIA of the nuclear power station.

While the basic EIA report was elaborated by the valid Czech EIA Act, the scoping list for the EIA review (including standard environmental assessment, health risk assessment, social impact assessment, etc.) was put together on the pertinent appendix of the EIA Directive of EU and with respect to comments of Austrian and German experts and requirements of EU based on the Euratom Agreement, the assessment itself was elaborated by a team of independent experts appointed by the Degree of the Czech Government which put together an extended expert background composed of experts not having dealt with Temelin NPP until then. All available applicable data were used. The assessing team worked in a contact with Austrian and German experts and under the assistance of EC specialists.

The background data (namely the EIA report, but also sets of ten of other documents), scoping list and EIA review were made public in Czechia, Austria and Germany. Public hearings were a part of the 30-day notification period of the EIA report. The conclusions of the experts and the comments of the public were involved in the final expert statement of environmental impact assessment of Temelin NPP.

This result should become documentation for following political negotiations of representatives of the concerned parties. Temelin NPP is not supposed to be commissioned into a commercial operation before concluding the above-mentioned exercise.

EIA, nuclear energy, public, scoping, Temelin

Ecological Vulnerability of Landscape - How to Categorise It?

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Categorisation system of ecological vulnerability of the landscape is designed as a modular system integrating available information sources on the landscape and interpreting the data from the point of feasibility of a policy, programme, or also a concrete project in a determined territory.

The ecological vulnerability features not only a nature-scientific but also a cultural dimension – as it corresponds with the character of a hundreds-years' inhabited and cultivated landscape.

The system of landscape categorisation should provide relevant data for assessment of environmental impacts and following decision procedures in the detail corresponding to the area of the affected territory and the extent and contents of the development goal.

The purpose of the landscape categorisation system is namely an expert support to:

- SEA - Strategy Environment Assessment
- EIA - Environmental Impact Assessment
- Design of regional and sectorial operational programmes
- Allocation of grants from the sphere of landscape management within both national funds and pertinent EU programmes (SAPARD, ISPA, PHARE)
- Design and modification of territorial development documentation

The aim of the categorisation does not consist in locking a considerable part of our landscape from any development but to hit off better the exceptionality of individual territories, their unique values and to support the development in the sense of real ecological capacity and genius loci.

The categorisation process results in ecological feasibility studies of realisation of development goals, priorities, trends, and concrete projects. Pilot categorisation was designed for ecological vulnerability and feasibility of a line construction, a 5-class feasibility categorisation was used:

- collision (unreal realisation)
- crisis (extra difficult realisation)

- compromise (conditionally real project)
- consensus (measures for realisation)
- non-collision realisation

landscape, vulnerability, feasibility, categorisation, EIA, SEA, physical planning, line constructions

Integrating Biodiversity Issues in Impact Assessments

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The rapid depletion of global biodiversity and the perceived dependence of mankind on biological resources have highlighted the need to conserve, sustainably use and equitably share these resources. The significance of Biodiversity Impact Assessment (BIA) as an extension of Environmental Impact Assessment (EIA) in order to ensure that biodiversity issues are explicitly considered in impact assessments is being gradually understood by the global EIA community.

This paper discusses the experience gained in conducting an ecological assessment of India's first expressway project linking two commercially important metropolitan cities-Mumbai and Pune. The expressway alignment transgresses through biodiversity rich forest landscape harboring a range of endemic and endangered species, both floral and faunal. During the scoping exercise the ecological criterion and the spatial context was established by bringing together experts on ecology, economics and sociology. The alternative options were then analyzed for possible impacts, benefits and costs keeping the biodiversity consideration in focus. Acknowledging that data and information on the status of biodiversity is always scarce and insufficient, the biodiversity community and the impact assessment community were brought together to plug-in information gaps. A range of mitigation measures based on the principle of "no net loss" of ecosystems, species populations and genetic diversity were developed, giving due consideration to factors that govern the conservation capability in a fragmented forest landscape. In-situ conservation measure of designating a biogeographically representative area as a "wildlife sanctuary" has been recommended for compensatory mitigation of some of the biodiversity related impacts due to expressway construction.

The paper stresses that concerted efforts are needed for integrating biodiversity concerns into planning and decision-making processes and issues relating to the (i) availability of researched information and (ii) promoting awareness about biodiversity amongst the impact assessment

community need to be effectively addressed for better integration of biodiversity concerns in EIA.

biodiversity conservation, expressway impacts, compensatory mitigation

Management Plan of an Area Affected by a Natural Disaster at Vargas Littoral, Venezuela

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The Plan site is located at the coastline of Vargas State and contains 85.5% of the population concentrated in its center, which has developed by forming settlements along the road parallel to the shoreline. Its surface covers 7% of the whole State.

The purpose of the Management Plan is the environmental recovery, the reconstruction of the urban environment destroyed by nature, and the creation of the corresponding regulatory instruments.

The magnitude of the disaster took place at the Central Littoral - due to meteorological, geological and anthropogenic causes - destroyed the urban areas and the roads. The worst damage was suffered by the infrastructure and service sectors, especially by the villages and areas located at the alluvial forks of rivers and creeks: Piedra Azul (Maiquetía), Guanape (Punta de Mulatos Sector), La Alcantarilla and Galipán (Macuto), Osorio, Germán, Cariaco (La Guaira), San Julián (Los Corales, Caribe and Caraballeda), El Cojo (Sector Las 15 Letras), Cerro Grande (Tanaguarena), Naiguatá (Naiguatá), Uria (Carmen de Uria), and Camurí Grande (Camurí). This highlighted the presence of unplanned settlements in high risk zones and without provisions for adequate environmental management.

In addition, to these problems are the environmental impacts caused by the loss of the vegetation cover, soils and other resources of flora and fauna at El Avila National Park; the negative effect of the hydrographic basins and the deterioration of the central coastal zone, considered the core of tourism, commercial and infrastructure services. Moreover, the coastal-marine ecosystems were affected and the shoreline suffered changes due to the accumulation of sediments.

After this event, the Management Plan was conceived as an instrument to give answers with an integral and prospective vision for a sustainable management of the area that covers

an approximate surface of 10,982 ha and includes 8 parishes. This instrument will contain all land use zones and establish the limits of the urban, tourist-recreational, conservation, protection and restoration areas related to the Northern slope of El Avila National Park and the existing basins, river beds and creeks; the urban area and the coast line, as well as the guiding the alignment of transportation and sanitary civil work corridors. Likewise, the Plan includes Special Regulation on the Use and Management of the area to give a legal framework to the proposals made.

New Zealand's Royal Commission on Genetic Modification: An Overdue Strategic Environmental Assessment?

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The Environmental Risk Management Authority (ERMA) is the New Zealand agency charged with considering applications for the importation, or local development, and release of new organisms, including genetically modified organisms (GMOs). The agency has been making decisions on GMO applications since July 1998, but its decisions were subject to increasingly vehement criticism from a variety of objectors.

In late 1999, the incoming government declared a moratorium on GMO approvals until a Royal Commission had had the chance to investigate the issue of genetic modification, and report back to government. The Commission began its work in mid 2000, completed formal submissions from recognised groups in March 2001, and is due to publish its report in June 2001.

This paper considers the role of the Royal Commission in the national debate on GMOs, characterises some of the key issues raised by submitters, and evaluates the process from the perspective of strategic environmental assessment.

New Zealand, genetic modification, GMO, Royal Commission, submissions, strategic environmental assessment

An Evaluation of Project-level Health Impact Assessment Practices in New Zealand

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The wording of the Resource Management Act 1991 in New Zealand implies that health effects ought to be addressed, where appropriate, in the assessment of environmental effects (AEEs) which developers must submit when seeking resource consents from regional and/or territorial local authorities. However, anecdotal evidence suggests health issues are not routinely considered by applicants, but when they are, they are viewed largely in terms of potential threats to physical health.

In the research described in the paper, carried out by the second author, a Masters student, the situation in Christchurch, the main city on the South Island of New Zealand, is used to explore the issues facing the effective practice of HIA in New Zealand. Various agencies, groups and individuals influence the way health issues are (or are not) captured by the consent process in Christchurch, and one aim of the research was to examine the perceptions key staff in these organisations have of HIA, its purpose, and how it should be carried out. Linked to this was the amount, and nature, of advice available for consent applicants from staff of the local councils and the public health agencies. The project also involved an evaluation of the treatment of health concerns in a number of AEEs.

The paper presents preliminary findings from the research.

health impact assessment, New Zealand, projects, resource consents, practices

EIA Follow-up: Outcomes and Improvement Discussion Paper

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Environmental Impact Assessment (EIA) follow-up refers to the activities undertaken during the post-decision stages of the process to monitor, evaluate, manage and communicate the environmental outcomes that occur in order to provide for some follow-up to the Environmental Impact Statement (EIS). Drawing on monitoring and auditing data, EIA follow-up is intended to provide feedback on EIA outcomes; e.g. ,How did the actual impacts of a project compare with the predictions in the EIS? Were impacts mitigated and managed in accordance with approval conditions set by decision-makers? How effective was the EIA process itself? In addressing questions such as these, EIA follow-up provides accountability for the outcomes of the process. The paper defines important terminology concerning EIA follow-up. It then briefly presents some key findings of a

workshop on EIA follow-up conducted at IAIA'00 Back to the Future in Hong Kong, June 2000. It is intended to provoke discussion which will generate answers to some of the challenging questions on the practice of EIA follow-up in key areas such as:

- EIA follow-up: what, why and how?
- What are the problems with implementation?
- What are the potential results and outcomes?
- What action can be taken on the basis of EIA follow-up results?
- Is EIA follow-up cost-effective?
- What is the role of EIA stakeholders during follow-up activities?
- What is the contribution of EIA follow-up to adaptive environmental management and broader issues such as cumulative impacts, health impacts, community impacts and Strategic Environmental Assessment?

In discussing these issues, the emphasis is on how to advance and improve follow-up activities which will in turn lead to improved EIA practices and acceptance of the process. Specifically this paper seeks to share the outcomes of recent EIA follow-up case studies, identify good practices in EIA follow-up and share the lessons learned.

EIA follow-up, monitoring, auditing, evaluation, best practice, adaptive environmental management

EIA Practitioner Perceptions on the Role of Science in Impact Assessment

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The process of environmental impact assessment (EIA) brings together a broad raft of professional practitioners including environmental policy-makers, administrators, decision-makers, government agencies, planners, engineers, scientists, social scientists, and business and project managers as well as the public. From the diversity of these practitioners it can be anticipated that people from different backgrounds will have different expectations of how the process should

function in practice. This paper presents the results of a follow-up survey of EIA practitioners in Western Australia. The purpose of the research was to examine the role of science in EIA based upon the experiences and expectations of EIA practitioners. Thirty EIA practitioners were interviewed. These were drawn from the Environmental Protection Authority (the peak body responsible for EIA in Western Australia) and its supporting administrative agency the Department of Environmental Protection, other government decision-making authorities, environmental consultants and project managers and environmental officers. Interviewees were also selected to represent different industry sectors (i.e. planning, industrial and resource development projects) as well as urban and remote settings. Interviewees were asked about the role of science in impact prediction, monitoring activities, mitigation and management, and EIA decision-making. The results indicate that practitioners have different expectations of the role of science in EIA according to the type of project and its location (i.e. urban or remote) and the stage of the EIA process. Most participants indicated that the role of science should be greatest during the earlier stages of EIA and provide the basis for these activities (i.e. baseline monitoring, impact prediction and mitigation design). Science was seen to be less important during decision-making and ongoing project management and should be kept in balance with other factors such as socio-political and economic considerations. Despite these differences, overall, good science was seen to be a hallmark for effective EIA.

science, environmental impact assessment, professional practice, monitoring, impact prediction, mitigation, decision-making

Tumen River SAP Project and Environmental Information System

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The Tumen River region in Northeast Asia is abundant with natural resources, has a great human resource potential, and is likely to become a focus of economic development. The region includes strategically and internationally significant waters, including the Tumen River with its tributaries, the Mongolian steppe, and Peter the Great Bay. This region has habitats of migratory birds and is also characterized by unique biological diversity.

However, the industrial and economic development will bring new dangers, and unless mitigation strategies are immediately implemented, growth in the region will

threaten the regional environmental resources. It is unlikely that national efforts will suffice to ameliorate their long-term impact.

There is a need for collaborative and region-wide activities to protect this area from the impacts of the industrial development that is likely to accelerate as a result of the recent geopolitical changes in the region.

Governments recognized early on that any success in attracting investment would have the potential to result in serious environmental degradation, if it were not managed properly and in a sustainable manner. For that reason, on the 6th of December 1995, the five member Governments signed the "Memorandum of Understanding on Environmental Principles Governing the Tumen River Economic Development Area and Northeast Asia."

The Tumen River Strategic Action Program (SAP) Project is to build the foundation for a long term, effective cooperation in the region called the TumenNet. GEF (Global Environment Facility) and five participating countries of the People's Republic of China, Democratic People's Republic of Korea (DPRK), Mongolia, Russian Federation, and Republic of Korea (ROK) funded 10.17 million dollars. DPRK does not, unfortunately, participate in the project yet. The project started last June.

It is composed of five components of SAP, Transboundary Diagnostic Analysis (TDA), Public Awareness, Environmental Information System (EIS), and Water Survey.

EIS component will contribute to increase the involvement of affected communities in the project and other project stakeholders and provide for basic information for Environmental Impact Assessment. The basic ideas for EIS are "Work for people, not scholars, minimize work scope, avoid new digitizing, utilize existing data, harmonize with sector reports." EIS deals with base information of international water and biodiversity, electronic-map, and web links.

Tumen River, Strategic Action Program (SAP), Transboundary Diagnostic Analysis (TDA), TumenNet, Environmental Information System (EIS)

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Strategic Environmental Assessment aims to incorporate environmental and sustainability considerations into strategic decision-making processes, such as the formulation of policies, plans and programmes. In order to be effective, the assessment must take the real decision-making process as the departure point. Existing SEA approaches are frequently tailored after an EIA model conceived from a rational perspective on decision-making. However, there are good reasons to assume that most strategic decision-making processes are characterised by a bounded rationality. Also, the predictability of environmental consequences generally becomes weaker at strategic levels than at the project level and complexity increases in terms of the numbers of actors involved in the decision. This paper examines various theoretical perspectives to decision-making and discusses the implications for decision support in general and SEA in particular. The authors argue that the design of the SEA must be more sensitive to the real characteristics of the decision-making context.

strategic environmental assessment, decision-making, rationality, decision sciences, complexity

SEA Analytical Tools and Their Application in the Energy Sector

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Strategic Environmental Assessment (SEA) has been developed to enhance the structured integration of environmental and sustainability concerns in strategic decision-making processes. SEA must be able respond and be adaptive to many different decision contexts. Different features will be necessary at different levels and in different sectors. This paper gives a theoretical and methodological overview of how SEA can be adapted to the energy sector planning and policy.

Decision-making and SEA: A Theoretical Perspective

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A key aspect, often neglected in SEA literature, is how and when to integrate various analytical tools within the SEA framework. The paper presents a theoretical model for SEA, specifically tailored for energy planning, which focuses on its relations to analytical tools addressing key aspects such as data input, scenario generation, uncertainty and preference/valuation. First, the theoretical foundations for SEA in decision-making sciences and the generic analytical needs will be discussed. Second the specific analytical needs for the energy sector are identified. Third, a description and analysis of a set of tools is carried out according to a set framework. Fourth, the principles and features of an integrated analytical-procedural SEA model are outlined.

strategic environmental assessment, SEA, policy and planning tools, energy, analytical tools, uncertainty, risk, valuation

EIA and Urban Air Quality: Which Standards Get Primacy?

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In environmental assessment, much is made of the issue of national standards. In urban areas, however, a dominant force is local standards, and often there are many layers of such standards: zoning standards, building codes, emission controls. Is EIA a source of additional standards or a means of articulating priorities among standards? Two Canadian examples will be used to show how different models of environmental assessment provide different answers to this question. Both examples are related to the issue of urban air quality and smog. The first example will consider new land development directly increasing air emissions. The second example will be new municipal road development indirectly increasing air emissions.

air quality, smog, zoning, emissions

EIA and Local Use of International Conventions: How Much Weight Should International Standards Receive?

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As more and more international environmental conventions reference environmental assessment as a central

implementation tool, it is necessarily essential that specific environmental assessments occurring at the local level consider these global issues. Yet, absent specific policies at the regime level, it seems unlikely if not impossible that individual assessments will provide appropriate consideration of such issues. Canada provides an important context for this issue given Canada's long history with environmental assessment and recent judicial consideration of international conventions. Three Canadian examples will be used to highlight the inconsistent consideration of international conventions in climate change and biodiversity. This will lead to an examination of options for reform.

Canada, conventions, biodiversity, climate change, judicial consideration

The State of the Environment in Bayelsa State of Nigeria

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Bayelsa State, which lies at the epicentre of the water-dominated and environmentally-fragile Niger Delta, is characterised by an intricate network of rivers, rivulets, creeks and streams which constitute the Nun River and Forcados River systems. These two river systems serve as the major discharge routes for the 2.23 million km² drainage basin of the Niger Delta and Benue Rivers.

It is interesting to note that Bayelsa State, which extends from the shores of the Atlantic Ocean in the south to about 10 kilometres north of the bifurcation of the River Niger into the Nun and Forcados Rivers, is prone to all types of devastating ecological problems.

By a sheer coincidence of fate, this same fragile environment is endowed with numerous natural resources, both renewable and non-renewable. The exploitation of some of these natural resources which include crude oil and gas, require technologically complex activities that leave in their trail unimaginable environmental devastation.

The cost of environmental degradation and health hazards posed to the oil producing communities is incalculable. Aquatic life in our rivers and creeks are made extinct since several species that were known to older generations are no more in existence. Agricultural yields are on the downturn as a result of continuous environmental pollution with reciprocal remediation of the land.

Environmental degradation is not limited to land and water only in Bayelsa but also to the atmosphere. One of the most devastating forms of environmental pollution is gas flares.

Bayelsa State, dissolute neglect, deprivation, monumental environmental devastation, topography, synergistic effects of velocity and volumetric flow, acidic compounds, pipeline corrosion

The Need for Resource Control / Management in the Niger Delta Region of Nigeria

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The history of resource control in this country dates back to the glorious days when agricultural produce such as groundnut, cocoa and palm produce were the mainstay of the economy of this country. In those days (in the 50s and 60s), coal and tin were mined in commercial quantity.

The parameters used in sharing the nation's wealth was 100% derivation. The peoples and regional governments directly controlled these resources and paid tax to the federal government.

However, the sudden twist in the history and dynamics of resources Control in the Country occurred when crude oil became the mainstay of Nigeria's economy.

Our big brothers in the north, west and eastern regions who enjoyed the full benefits of the groundnut pyramids, cocoa and palm produce, now turned around to fashion out obnoxious laws which vest the control of crude oil and gas in the hands of the federal government.

The situation our people have found themselves from this trend is abject poverty, a degenerated environment and mental torture.

In order to fulfill the wishes and aspirations of Bayelsans and to re-enact the tenets and practice of true federalism in the Federal Republic of Nigeria, it is therefore the collective WISH and WILL of the People of Bayelsa State, which we represent, to control our resources to have a new lease on life.

resource control, true federalism, marginalisation, tactical/strategic frustration, regional hypocrondiases, regional post traumatic stress disorder, exploration of crude and natural resources, oil exploration licence, oil mining lease, rights of pre-emption, regulation, delegation of powers, legality and interpretation, termination revocations

Lessons Learned - Preparing a Regional Environmental Assessment for the Elqui Watershed, Chile

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The Government of Chile, through the Ministry of Public Works, is designing a program to strengthen the integrated water resource management on a national level. Specifically, this program seeks to improve the management of water resources in eight watersheds in Chile by strengthening management tools, improving conservation and environmental and biodiversity protection, and targeted infrastructure investments.

REA Methodology and EA Process. For each region in which the program is considering interventions, a Regional Environmental Assessment will be completed as input into the Integrated Watershed Management Plan. Each REA will include watershed-specific analysis of the most critical environmental issues, legal and institutional analyses, an assessment of cumulative impacts, and an environmental management plan. Project-specific EIAs for projects funded by the program will each enter into the existing EIA review system of the Government. Review and approval of all Environmental Impact Assessments and Declarations of Environmental Impacts are a prerequisite for an environmental license.

Cumulative Effects Assessment. The effort to analyze cumulative effects was the first such effort in Chile. All projects whether ongoing or planned, public or private, with some relevance to water resources were identified and included in the analysis of impacts. The REA will serve as a tool to open future dialogue across various sectors.

Lessons Learned. This project is a World Bank-financed project, and is categorized as an "A" – meaning that there could be significant and irreversible environmental impacts of project activities. Therefore, the borrower was required to carry out an environmental assessment. The Bank project team suggested the methodology outlined above. The paper will explore this approach, and assess under what circumstances this is a sound and responsible way to comply with World Bank fiduciary responsibilities.

strategic environmental assessment, regional environmental assessment, integrated water resources management, lessons learned

Integrating Education, Training and Communication for Public Involvement in EIA

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We are going to a globalised world, thus involving the integration of every activity and every person. The public involvement in the development process is evident, taking into account that any objective will affect the people and any negative feedback could influence the result of the investment.

Generally the public could be influenced by amplification of negatively-evaluated consequences, resulting in psychosocial effects leading to illness or anxieties. This problem will be resolved by the public access to information provided by experts.

A real-time interactive communication system is proposed as an open tool in order to facilitate decision-making by access to rapid and reliable information.

The main task of the system is to collect, process, display and exchange the information relative to environmental impact assessment (EIA), to provide assistance and receive specific opinions, and for public understanding of the field.

The education and training integration will mitigate the barriers which may inhibit the interaction and communication process. To increase learning will assure specialists-public interaction and a good information flow for knowledge exchange.

The paper will outline key approaches in reaching agreement on the importance of the peoples' educational process. The impact of development will be available to the public revealing the positive consequences, such as increased employment and income.

An effective way to avoid negative reactions consists of extensive consultation to identify the concerns and needs of the public and access to suggestive and attractive programs for education and training.

The system is developing as a modern information module, integrated into complex international management systems. It can be placed everywhere; everybody could access the facilities for education, world experience and training.

Providing a real-time response to citizen concerns, the system represents an economical and rapid way to mitigate the consequences of development and to provide meaningful input to the decision-making process.

Lessons Learned: A Case Study of the Grand Coulee Dam

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In 1998, the World Commission on Dams began investigating predicted versus actual social, environmental, and economic impacts of large dams globally. The Commission selected the Grand Coulee Dam, and its associated irrigation works in Washington, for inclusion in its "knowledge-base." Below we describe lessons learned from examining the project's effects over the past sixty years.

Failure to provide an opportunity for Native Americans and relocated settlers to participate in planning led to resentment and conflict that, in some cases, is ongoing. This discontent underscores the importance of having an open planning process so issues among stakeholders can be addressed early.

Rules for project operations did not recognize how changes in scientific information, economic conditions, technological innovations, and social values would influence how project outputs and impacts were valued over time. Periodic re-evaluations of operations are needed to ensure that projects can adapt to changing conditions.

Stakeholders and planners did not employ a common framework for appraising portions of the project linked to irrigation. For example, they did not distinguish between a financial appraisal and an economic appraisal. Consequently, disagreements persist about the nature of the project's irrigation subsidies and the indirect benefits of irrigation.

Equity should be a major criterion in deciding how to compensate adversely affected parties. Grand Coulee's

planners simply employed market value in taking private lands for project purposes, but this failed to provide fair compensation to groups such as Native American tribes whose salmon-based cultures were significantly impacted by the project.

Actions having irreversible and cumulative impacts on anadromous fish in the Columbia River Basin were taken without careful study. The failure of planners to give weight to these impacts has impaired the ability of managing agencies to save several endangered species. Potential irreversible and cumulative impacts of dams should be studied *ex ante*, with input solicited from potentially affected parties.

Tennessee Valley Authority Integrated River Basin Development-From Strategic Planning to Project Implementation, Monitoring, and Evaluation

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The Tennessee Valley Authority (TVA) was created by an Act of the U.S. Congress in 1933 to develop the resources of the Tennessee Valley. TVA's early task emphasized an attack on the barriers to development-floods, poor transportation, poor land management practices, and a general malaise reflecting a population with little hope for the future. Following construction of an integrated system of dams and reservoirs, TVA managed the system primarily to provide for navigation, flood control, and (consistent with those purposes) power generation.

In February 1991, in response to the increasing public and political demands, the TVA Board of Directors changed the long-term operating priorities of the Tennessee River and reservoir system by adopting a 5-year Lake Improvement Plan (LIP). In developing the LIP, TVA prepared an environmental impact statement to evaluate the costs and benefits of alternative strategies to incorporate water quality and recreation into the three original operating purposes and to provide for extensive public involvement. Site-specific reviews were tiered from the EIS. Predictions and mitigation were monitored and evaluated to verify accuracy and effectiveness. Results include recovery of over 180 miles (290 km) of lost aquatic habitat, improved levels of dissolved oxygen in over 300 miles (482 km) of rivers below TVA dams, and extended lake level on 10 tributary reservoirs. Currently, a TVA lake-level policy task force monitors the changing needs of the region in preparation for a future

reexamination of existing river and reservoir operating policies.

This paper discusses the components of strategic and project-specific environmental impact assessment, including monitoring and evaluation, as derived from the literature and the application by TVA of those components in making policy and subsequent project decisions that address the changing needs and public demands of the people of the Tennessee Valley region.

strategic impact assessment, river basin planning, public involvement, project monitoring and evaluation

Molecular Marker Assisted Breeding: A Potential Alternative to Transgenic Crop Improvement?

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While transgenic crops are seen by some as a critical means to meet the growing food needs, especially of the poor in the tropics, biotechnology offers other techniques that have significant potential to increase food production. Marker-assisted breeding can enhance the efficiency of conventional breeding as well as lead to quicker results at a lower cost. Moreover, the current generation of transgenic crops focuses on a single trait and a single gene for that trait but molecular markers have the potential to facilitate the pyramiding of multiple genes for multiple traits and to incorporate greater genetic diversity into crop varieties. This paper examines the potential impacts of marker-assisted breeding. The cost effectiveness of conventional breeding and marker-assisted selection are compared in a case study of bean breeding for resistance to the golden mosaic gemini virus. The precision of molecular markers is critically assessed and different limitations to the method are considered. A risk assessment framework for comparing the potential impacts of markers on crop productivity and on the environment in contrast to genetically modified crops is developed.

transgenic crops, marker-assisted breeding, costs of breeding, risk assessment

The Impact on Public Agricultural Research of Biosafety Regulations for Transgenic Crops

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Concern about the biosafety of transgenic crop varieties has led to a regulatory regime covering their use. This regime is embodied in international agreement, through the Cartagena Biosafety Protocol to the Convention on Biodiversity as well as being a matter of national regulation in many countries. This paper reviews the regulatory requirements for risk assessment for transgenic crop varieties, noting common criteria including assessment of the risks of gene flow to other species, weediness, impact on non-target species, and human health. Despite differences in standards and processes through which these criteria are applied, there is clear consensus that these risks need to be addressed. This contrasts with established practice for conventionally improved varieties that are released based solely on agronomic and economic performance without any assessment for environmental impacts. However, with the increased risks associated with new transgenic crop varieties, impact assessment must now take a more comprehensive approach similar to the assessment of natural resource management interventions. This paper discusses some of the increased methodological complexities implied with the new impact assessment framework required for transgenic crops. In addition, there are important institutional impacts to be confronted, especially in the case of public international agricultural research. Historically, public international research institutes improved germplasm was distributed freely to national research programs subject only to agronomic/economic impact assessment. However, the institutional responsibilities for conducting the additional environmental impact assessments for transgenic varieties have yet to be clarified. Without a clear plan for conducting these assessments, the deployment of transgenic crops will not be possible. Furthermore, investment in research to develop such varieties is not justified even if they were to be benign environmental impacts. Finally, the need for more thorough impact assessment prior to the release of transgenic crops effectively increases research costs. The paper briefly considers how differing research costs between transgenic and conventional varieties can affect benefit/cost considerations and thus priorities for agricultural research.

transgenic crops, regulation, impact assessment methods, public international agricultural research, natural resource management

When Is an SEA an SEA?

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The question keeps coming up – when is an SEA an SEA? The examples of the so-called SEA multiply, the notion and understanding of the limits of SEA are broader and fuzzy, the object of strategic assessment ranges from policy to major projects - all accepted by experts in the field! Yet, their feeling of unsatisfaction often remains, the feeling of still having the same unanswered questions!

Typically, anything that could not be well resolved with project EIA is certainly because an SEA should have applied!!

In the limit, an SEA is an SEA because it looks more attractive and fashionable, and because Mr. X so decided! By applying an SEA it proves that those who do it are up-dated with the most current knowledge on environmental assessment and certainly pair up with the most advanced practices!

Wrong moves!!

SEA is not a panacea for the deficiencies of EIA! It is increasingly urgent that this point is made clear, not only in theory but in practice. By following this path of making anything sound like an SEA, of mixing up SEA with what is, or used to be, well named as EIA, what we may get in the end is the total discredit of the values and objectives that motivated the generation of a new approach called SEA.

The motivation for this paper derives from the notion that may be SEA, as currently generally used, is addressing the wrong target. It is argued that SEA should focus certainly on the policy and more on the strategy that supports a plan or programme rather than on the plan or programme outline, solution, document itself! It is also argued that SEA should focus more on the decision (the cause) rather than on the modifications on the environment (the physical, ecological, social, economic consequences). It is finally argued that throughout the decision-making process there are critical decision moments (decision windows) that should be the targets of SEA.

The purpose of the paper is to generate discussion around its initial question: when is an SEA an SEA? What are the signs of evidence of an SEA? And to possibly come up with concrete ideas that can contribute to the clarification of the purpose and role of SEA.

SEA, sustainable development, decision-making

First Review on Country Status on the Integration of Environmental, Social and Economic Issues in Spatial Planning

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An International Study for the Development of a Framework for Integration of Environmental, Social and Economic Issues in Spatial Planning was initiated last year in Hong-Kong, at the time of the 20th Annual Conference of IAIA, when the first project meeting, with many of its contributors, took place. In the interim, the Study was given formal project status by the IAIA Board.

According to the work programme for this project, a number of case-studies are currently being conducted to verify existing national or regional planning systems and procedures with respect to the considered forms of integration adopted in the project. The purpose is to collect evidence of current practice, which will provide the basis for further elaboration on a potential framework for integrated spatial planning.

This paper aims to provide the main elements that are shared, or that are emphasized, in each case-study developed ahead of the Cartagena meeting and that will be presented at the workshop. It is therefore the document that will support a workshop discussion on a tentative framework.

spatial planning, integration, SEA, sustainable development

The VIAOESTE Environmental Management Plan

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VIAOESTE S.A. is a company created to construct new roads and operate new and existing roads included in the concession agreement signed in March 30, 1998 with the Government of the São Paulo State, Brasil. The concession agreement includes the following roads:

- SP-280 from km 13.7 to km 79.38;
- SP-270 from km 34 to km 115.5; and
- SP-075 from km 0 to km 15.

The total concession road system covers about 162 km.

The main objective of the Environmental Management Plan (EMP) is to enable the company to manage the environment-related questions in accordance with the concessionaire construction and operations activities. The size of the enterprise and of the construction work to be performed requires a consistent Environmental Management Plan, which is necessary to prevent and mitigate environmental impacts and also to preserve the company's image and its main patrimony that are the roads.

The EMP has all the compromises, activities to be performed and their respective implementation time schedule.

The VIAOESTE compromises are translated into seven programs structured to enable control measure and evaluate potential environmental impacts, and mitigate and compensate negative environmental consequences.

The main programs are:

- Corrective Action Plan for existing environmental liabilities
- Environmental monitoring of the construction phase activities
- Environmental management of the operation and maintenance activities
- Control of the environmental licensing and Compensatory programs
- Resettlement actions
- Sustainable development of the cities served by the roads
- Environmental education and social communication

The EMP is continuously updated and revised due to the high company dynamics and also due to the long concession contract period. To comply with the IDB monitoring requirements, the Company reports quarterly and annually on the implementation of the EMP.

Integration of an Environmental and Urban Impact Assessment Course in the Master's Degree Program on Urban Development Projects in the Iberoamericana University in Mexico

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Since 1946, Mexico has faced accelerated urban growth due to policies applied by the Federal Government to increase industrial development. These plans required large movements of labor force, which were accentuated by the

lack of adequate attention to rural areas. Farmers abandoned their communities and migrated from the countryside to the cities, which seemed to offer better life opportunities, expanding demographic concentration of Mexican urban areas.

By 1970, planning authorities started to design regulatory land use strategies taking into account the cities' population necessities. City planners and other professionals collaborated in urban planning and laws on this subject were issued. A decade later, in the 1980s, environmental aspects were incorporated in urban planning and development. The General Ecological Balance and Environmental Protection Act issued in 1988, states the need to curtail urban development without environmental protection.

Due to the increasing demand of qualified professionals, some graduate and postgraduate courses on urban development and related areas have been designed in several Mexican universities.

The main purpose of this paper is to present a brief description of the nature, outline and objectives of the multidisciplinary master's degree program in "Urban Development Projects" offered at the Architecture, Urbanism and Design Department of the Iberoamericana University in Mexico City, and emphasis on the "Urban Ecology" course which provides students with the knowledge and performance of activities related to environmental and urban impact assessment of this kind of project.

accelerated urban growth, urban planning, environmental protection, qualified professionals, urban development projects, master's degree program

SEA and Integrating Environment into the Decision-making

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The presentation will focus on the role of the process in the context of SEA and integrating environment into planning/decision-making.

Process is understood as what has to be done when and by whom. The goal of the process is to introduce SEA and the environment into planning in a systematic way from the beginning until the end. Relevant actors in this process are planners, SEA experts, environmental experts/authorities,

the public and the decision-makers. The question is how to bring together these relevant actors on an equal level.

Experience shows that first of all exact planning concerning the design of the planning and SEA is necessary. In addition to the process design the relevant actors have to be identified in time and it has to be settled how to bring them together. The scoping phase has to be extended from methodological to process oriented questions.

Two different process approaches were tried out in pilot SEAs. In both cases the SEA was integrated into the existing planning-procedures. The process was carried out in different ways. In one case the process approach was a traditional one. The planner was in charge of the SEA. The environmental authority, the public and the decision-making authority were involved at certain moments. This process worked well due to the highly motivated environmental authorities support of the planner well beyond the foreseen steps.

This experience was reflected in the second approach where all relevant actors were brought into one team. The team was responsible for the planning and the SEA. The process was managed and organized by a process manager. The discussions in the team were regulated by a moderator. This approach requires clearly defined rules and communications skills from the participants.

The results in both cases show that process management is necessary to support integration of environment in the context of SEA.

strategic environmental assessment, SEA, integration, process, Austria

Evolution of the Mangrove in Cispatá Bay Area. Comparative Analysis (Poster)

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In 1994, ECOPETROL and BPXC, because of the need for appropriate facilities to store and export the crude of the Cusiana field, decided the presentation of the project of Extension of the Coveñas Oil Terminal.

The oil activity in all stages is regulated environmentally and the implementation of this project required the

presentation of an Environmental Impact Assessment Study as a part of requirements from the Ministry of Environment within their process in order to obtain the Environmental License.

The implementation and structuring of this research had to incorporate into the project the identification of mangrove systems units in Cispatá Bay area near the Caribbean Sea.

The knowledge about the area identified the growth of the mangrove systems associated basically to the change of the mouth of the Sinú River in this area.

In that sense this abstract will present the methodology that was implemented in order to determine that the process of formation of the forest of mangrove systems in the zone is real and in spite of the intervention by the man in these systems, the zone has prospered, generating great areas covered by forest with mangrove systems.

Basically the study is based on temporal and spatial analysis for a period of 37 years. Based specifically in photo-interpretation of the aerial material available for the zone, the exercise consisted of the identification of the use of the ground for each of the consulted years.

environmental impact assessment, mangrove systems evolution, oil sector, Ministry of Environment, Colombia

On-Farm Biotechnology for Cassava in Colombia: The Potential Impact of Rapid Propagation

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Although biotechnology is generally seen as a high-science, laboratory-based activity, some biotechnology techniques can be potentially adapted for use even by resource-poor farmers like cassava growers in Colombia. It has long been known that *in vitro* propagation of cassava can produce planting material that is free of virus and other diseases and higher yielding as a result. However, the cost of producing planting material in the laboratory is high, and the difficulties of distributing the resulting material to dispersed small farmers are great. This paper assess the potential impacts of a novel community based “on-farm” system for producing through tissue culture clean planting material with higher yields. First alternative systems for producing cassava planting material are described. These include conventional on-farm production of vegetative planting material, community-based rapid propagation through tissue culture of clean planting material, and laboratory based

rapid production systems. The full inputs and costs, variable and capital, of the various systems are estimated for different scales of production. The benefits of disease- free cassava seed are calculated based on experimental results. The costs and benefits of the three systems are compared and a sensitivity analysis is conducted.

biotechnology, on-farm, cassava, rapid propagation, costs and benefits

Cumulative Impact Assessment in the Water and Sanitation Projects: Cartagena: Water Supply, Sewerage, and Environmental Cleanup Project

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To assist the Government of Colombia in addressing the problems related to water pollution in the city of Cartagena, the project will develop a cost-effective approach to comprehensive wastewater management and water pollution control in the major water bodies in and around the city. Cartagena, a Caribbean city in the northwestern part of Colombia, is one of Colombia’s five most important cities with almost 800,000 inhabitants. The project will include investments for the collection, treatment and final disposal of domestic sewage. The communities living around a major urban wetland – the “Ciénaga de Tesca” Lagoon – and surrounding areas will benefit from proposed investments in water and sewage collection, while the benefits of treatment and final disposal will benefit the entire city. The project will also include water supply systems for the poor rural communities North of Cartagena, which lie near the path of the proposed outfall. When completed, the proposed project would have: (i) improved water supply by rehabilitation, expansion and optimization of the operation of water supply systems and by developing additional water supply sources, expanding water coverage up to 95%, so as to ensure the increased demand up to the year 2010; (ii) improved sewerage and drainage services in Cartagena by expanding the coverage rate of the sewerage network (up to 95%), especially in poor marginal areas; (iii) contributed to environmental cleanup and protection in Cartagena by providing installations for controlling pollution of water bodies surrounding and crossing the urban area; (iv) supported the consolidation of new institutional arrangements with private sector participation (ACUACAR, the Water and Sewerage Company of Cartagena is a Municipality-Aguas de Barcelona mixed public-private enterprise); and (v) contributed to the goal of achieving sustainable economic development in the Cartagena region

by ensuring reliable water and sewerage services and alleviating water pollution problems.

Perhaps the most environmentally and socially sensitive component of the proposed project will be the construction and operation of an ocean outfall discharging into the Caribbean Sea. The environmental assessment process was based on a two-phase approach: (i) a feasibility study analyzed collection, treatment, and disposal options which were compared on their technical, economic and environmental merits; (ii) once a project scheme was selected, a more detailed environmental assessment designed a comprehensive environmental management plan (EMP). A World Bank-appointed panel of five international experts, with broad experience in wastewater management, design and construction of ocean outfalls, water quality and oceanographic modeling, environmental impact assessment, and private sector participation provided advice, reviewed technical reports, and participated in public consultation meetings.

Perhaps the most important methodological characteristic of the EA was the introduction of cumulative impact analysis. All projects, whether ongoing or planned, public or private, with some relevance to the sanitation conditions of the city, the conservation of wetlands and other ecosystems, and the expansion of the urban perimeter were identified and included in the analysis of impacts. Major projects identified included: sewerage expansion and improvement in the Cartagena Bay sewerage network financed by the InterAmerican Development Bank; a new outlet (Bocana) for the Cienaga de Tesca Lagoon, financed by the Dutch Government; a proposed national highway which will surround the southern perimeter of the Cienaga de Tesca Lagoon which will be constructed by the National Highways Institute (INVIAS); a proposed expansion of the city airport which will impact on some wetland areas; and private tourism development plans on the northern area of Cartagena. The social dynamics in and around the Cienaga de Tesca lagoon was studied in great detail. Invasion and illegal filling of wetland has been exacerbated by an increased influx of population displaced by violence and other political instability in Colombia. The environmental impact analysis was carried out with this dynamic setting as a backdrop. Finally, and most importantly, the EA effort interacted with ongoing efforts by the municipality of Cartagena to prepare a new land use plan. The conveyance systems, treatment facilities and outfall site, as well as a protected area in the Cienaga de Tesca Lagoon have already been incorporated in preliminary drafts of the land use plan.

Public Participation and Sustainability Issues within EIA: The Indian Context

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Almost all development projects invariably place the greatest demands on critical and scarce natural resources. One of the fundamental objectives of EIA is the assurance of environmental and biodiversity resource sustainability. The sustainability indicators are varied and many and are often too complex to be dealt by environmental resource managers and environmental assessment experts alone. The complexities of sustainability issues are dictated by the ecological and biodiversity values of resources directly impacted by the proposed development and also by persistent and long-term dependencies of local people on such resources.

In most regions of the world, consultative approaches involving "open door" model of public involvement is now being seen as an effective step in environmental assessment for addressing biodiversity threats and emerging sustainability crisis. In India too, public involvement has become a mandatory step in EIA ever since the publication of a legislative notification in the official Gazette of the Government of India in April 1997. The existing framework adopted for public participation in India has not been very effective in the appraisal of all the development-induced impacts on biodiversity and their resultant impacts on the indigenous people and vice-versa.

This paper projects the inherent weaknesses in the public hearing process currently in place in India. Lack of proactive participation by inadequately represented stakeholders in public hearing conducted by the project authorities has failed to precipitate the reliable information for decision making. The paper discusses options to overcome some of the pitfalls of the existing consultative process and also highlights the advantages of initiating public involvement fairly early in EIA to make it an integral feature of assessment procedures.

resource sustainability, biodiversity conservation, public participation

Integrating HIV/AIDS Issues into the Environmental Assessment Process

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HIV/AIDS has become one of the foremost issues threatening global sustainability. The disease, first described in 1982, is now crippling development, especially in Africa. HIV/AIDS is no longer only a health issue but rather a development issue requiring interventions on all fronts. Environmental assessment (EA) developed out of a recognised need to protect the biophysical environment from over-exploitation. As environmental practices became established, practitioners have expanded the concept of "environment" to incorporate social, economic and health issues. Some success has been achieved in this regard but the alarming incidence of HIV/AIDS demands that it be given greater priority in all aspects of development, including EA.

This paper proposes that EA can play a significant role in reducing the transmission of HIV and limiting the impact of AIDS in development projects. The Environmental Impact Assessment (EIA) process is well established within many countries and development agencies and thus provides an ideal vehicle to bring an HIV/AIDS component into projects. As EA includes EIA + environmental management, the process can be adapted to include HIV/AIDS impact assessment + HIV/AIDS management. It is proposed that HIV/AIDS interventions should be built into the EA process from the start. This requires the adaptation of existing EA tools and the incorporation of new tools into the EA process while still ensuring that the EA is not overburdened by the HIV/AIDS component. An early screening process using checklists, matrices and key questions will identify vulnerable projects and communities. This will determine the need for a full HIV/AIDS Impact Assessment, surveillance programmes, or the development of an HIV/AIDS Management Plan. Case studies of development projects in Uganda and Ethiopia are used to illustrate this approach. The ultimate outcome will be projects that proactively deal with HIV/AIDS and limit the impact of this epidemic on staff and impacted communities.

HIV/AIDS, environmental assessment, development projects

Environment Assessment of Urban Land Use Plans in Chile: A Practice that Builds Sustainability

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In Chile, regional and urban land use plans must submit to the "Environmental Impact Assessment System" prior to approval and implementation. This practice came into force in 1997, and since that time Chile has developed a singular experience in this type of environmental evaluation. As of October 2000, more than 150 plans have been evaluated. Before that, Chile had no formal or systematic mechanism to include environmental considerations in physical planning.

Regional offices of many Government Ministries participate in the environmental assessment process, revising and approving plans. This has meant a significant improvement of Chile's institutional capacity for physical planning, a process scarcely implemented in the last 25 years. Urban planning professionals in Chile have also improved their capacity to include environmental considerations in their approach, although, municipal urban planning staff does not always have sufficient expertise. Additionally, the citizen participation process could benefit from more attention. On the whole, though, institutional talent developed through this process strengthens co-ordination, transparency, multi-sector and interdisciplinary practices, integration of technical and political perspectives, and other necessary attributes needed to reach sustainable development.

In relation to the content of environmental assessment, it was first necessary to identify and build consensus on the environmental considerations in Plans. Currently, CONAMA (Chile's National Commission for the Environment) is establishing criteria and elaborating guides for environmental assessment, including technical tools for assessing the different environmental components (water, soil, biodiversity, landscape, cultural heritage, etc.) of plans, a different process from evaluating projects. This is a great challenge, considering the lack of availability of baseline information, the scarcity of funds and limited expertise, above all if the criteria must be immediately applicable in a country with significantly different local and regional realities.

strategic environmental assessment, land use planning, procedure, practice, carrying capacity, Chile

Sharing Knowledge in the EIA Preparation Phase

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Sharing knowledge in an IA process is essential. Increased accessibility of knowledge will make proponents more aware of environmental consequences, will enable authorities to improve their decisions and IA practitioners and the public in general will profit from shared experiences. Software tools can facilitate knowledge sharing between the various participants. An example is DR-EIA, a screening and scoping expert system to assist in the preparation of a terms of reference for implementation of an EIA. We give an overview of the current status of the instrument. Development of such a system should be user-driven. We present ideas from (current and potential) users on how such an instrument can help to get their job done and how future development of the instrument in different user environments worldwide can be implemented. A live, hands-on version of the program is available at the session.

EIA, knowledge sharing, screening, scoping

Follow Up Studies in Cumulative Effects Management Applications in Developing Nations

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Cumulative effects assessment is now routinely required as part of environmental impact assessments for project approvals in selected developing countries, but this has been effective only recently. Some view these cumulative effects assessments as a necessary and costly component of the development approval process.

In some developing countries, legislation or regulations require that environmental impact assessments be completed for certain within-country projects. Projects funded by international financial institutions or by national agencies from nations such as the United States, England and

Canada, require that comprehensive environmental impact assessments be completed as part of the funding approval. While such requirements exist, there is a wide variability in the quality of the impact assessments and the review process. Despite these problems, many developing nations recognise the importance of the environmental assessment process in helping to manage environmental effects. There is also increasing awareness of the importance of including cumulative effects assessment as part of these processes.

Some international agencies, governments and practitioners have argued, however, that inclusion of cumulative effects assessment as part of the project approval process will place unjustifiable demands on the environmental review process given existing in-country capabilities, data availability and financial costs. Concerns are also raised about the willingness of countries to modify legislation to include cumulative effects assessment and to enforce such requirements.

Based on several case studies, it is argued that rather than a burden, cumulative effects assessment and management offer developing countries opportunities to move effectively towards environmentally- and socially-sustainable development. Cumulative effects assessment should not be viewed as another regulatory tool for environmental management, but rather as a tool to identify cumulative (often regional) environmental concerns, and to formulate methods to manage cumulative impacts. When properly conducted, the results of cumulative effects assessments could have many applications:

- environmentally- and socially-sustainable land use planning
- coastal and marine resource planning
- forestry, agriculture and watershed management
- human safety and disaster management
- development of contingencies and responses to global warming
- maintenance of biodiversity

To be effective, management of cumulative effects in developing nations should be human-centric; that is that management tools should clearly describe the benefits to humans of effectively managing cumulative effects, while also providing solutions for minimising cumulative environmental impacts. This presentation will also focus on the critical role of follow up studies in managing cumulative effect. Such an approach will aid local communities and residents in better understanding the linkages between environmental health and their quality of life, and eventually promoting practices that will help achieve the goal of environmentally- and socially-sustainable development and management.

follow up studies, cumulative effects assessment, cumulative effects management, developing country EIA

The Integration of Strategic Environmental Assessment (SEA) and Local Planning in South Africa

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Strategic Environmental Assessment (SEA) is evolving as an important decision-making tool for sustainable development. In South Africa guidelines for SEA at the plan and programme level have been produced. However, the majority of SEA application has been at the programme level. Currently, SEA in South Africa is intended to be a self-regulating tool. Initiation of SEA would arise from the benefits it provides to decision-makers. SEA is seen as a tool for operationalising sustainability objectives and integrating them into strategic level decision-making. SEA has emerged in South Africa as a result of:

- The limitations of project-specific EIA in addressing cumulative effects and in placing specific projects within a wider policy and development context;
- The need to integrate sustainability and environmental quality objectives into planning; and
- The need to provide guidelines at the planning level for project-specific EIA.

A programme to create awareness and build capacity for the integration of SEA and local planning will be initiated in South Africa by the national Department of Environmental Affairs and Tourism. This programme aims to integrate SEA and planning by doing the following:

- Creating awareness among environmental practitioners and planners that integration is imperative for sustainable development;
- Building the capacity of local authorities;
- Sharing the tools, techniques and approaches from the environmental assessment and planning disciplines; and
- Developing the methodology for the integration of SEA and planning.

This paper provides an overview of: (1) the process to integrate SEA and planning; and (2) the challenges facing this integration in South Africa.

SEA, planning, integration

Public Consultations in Environmental Assessments: The World Bank Experience

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Public consultations in the Environmental Assessment (EA) process promote the designing and implementation of projects that are environmentally and socially sustainable. Information derived from the consultative process helps in the reduction of conflicts, minimizes costs, and is often used to change project design and select alternative sites in order to protect cultural sites and sensitive habitats with rare animals and plants. In the end consultations assist in the designing of projects which reflect the interests and concerns of the various stakeholders.

The World Bank often conducts internal reviews of its portfolio in order to assess the quality and quantity of public consultations in the EAs. This paper analyzes public consultations in World Bank financed projects from 1997-2000, compares its findings with the reviews conducted in 1992, 1996 and 1997 and highlights the trends. The paper notes that there are both quantitative and qualitative improvements in the Bank's EA consultations. It attributes the improvements to factors both within and outside the World Bank. Within the World Bank, some of the changes include the increased role of the Inspection Panel, Safeguard Compliance Unit, Quality Assurance Group and increased training on the Bank's safeguard policies with emphasis on public consultations and disclosure. Outside the Bank, the capacity of civil society and enabling environment (laws and government commitment in borrowing member countries) have been critical factors.

The paper concludes by pointing out some of the obstacles within the World Bank and the client countries to effective public involvement. It also provides a set of recommendations to improve public consultations in the EAs of World Bank financed projects.

The Right to Participate in Environmental Decision-Making: Public Participation in the Environment Assessment Process in East Africa

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The paper examines the international instruments on the right to participate in decisions that affect the environment and assesses the extent to which the laws on public participation and disclosure in the three East African

countries of Kenya, Uganda and Tanzania propound the principles embedded in these instruments.

To understand how the laws on the books are implemented, the paper analyzes three reports on public participation in Environment Assessment (EA) process of six (6) development projects, four of which were financed by the World Bank. The criteria to assess public participation included the quality of the information, whether it was received in a timely and effective manner, extent to which the views of the consulted were taken into account during the decision-making process and the avenues available to the public to guard against arbitrary disregard of its input into the EA process.

The paper finds that the public was able to participate in some of the projects, but the desirable levels of “meaningful consultation” were still lacking. It explains that well written laws and development agencies policies on public participation do not operate in a vacuum. The levels of governance, government’s view of the EA process *vis-à-vis* development, capacity of institutions to implement the laws, and capacity of civil society to participate are a pre-requisite to a meaningful dialogue. Paper makes several recommendations which governments and development agencies may consider to promote more effective public involvement in environmental decision-making as a whole and the EA process in particular.

Bolivia-Brazil Gas Pipeline

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The paper presents highlights of the environmental and social aspects of the Bolivia-Brazil Gas Pipeline Project. It covers:

1) Project Description: including the pipeline itself, metering stations and compression facilities. It describes the Gas Pipeline from Rio Grande in Santa Cruz Bolivia to Sao Paulo (Replan) and then on to Porto Alegre in Rio Grande do Sul in Southern Brazil. It also describes city gates and tie-ins to current or future projects.

2) Parks: the pipeline crosses three important and distinct areas which required special studies and care. Those are the Parque Nacional Gran Chaco (Kaa Iya) in Bolivia, the Pantanal which covers portions of Bolivia and Brazil, but the

pipeline crossed it mostly in Brazil, and the Mata Atlantica, located near the Atlantic coasts of Brazil.

3) Environmental Management: describing Environmental Impact Studies, licenses and permits, Environmental Programs and costs, the multiple levels of control, inspection, auditing, etc. Numerous organizations were involved in the monitoring, national within Bolivia and Brazil and foreign, mostly from the US and Canada.

4) Social Aspects: the interrelation with the Civil Society, compensation to non-Indigenous towns and communities, public audiences, interrelation with NGOs, Ombudsman’s role.

5) Indigenous Peoples Development Plan benefiting 77 communities in Bolivia. The Plan covers: a) Community Relations, b) Management of Sustainable Development Projects, c) Land Titling and d) a Fiduciary Fund for Park Kaa Iya of Gran Chaco. Similarly in Brazil benefiting 22 communities in three states. Major accomplishments are described in both countries.

6) Preventive Plan for management of possible unknown discoveries during construction, such as dangerous materials and archeology. The paper describes the important scientific discoveries made in several archeological sites along the right of way of the pipeline, mostly in areas close to the shores of Rio Grande and Rio Parapeti in Bolivia and Mato Grosso do Sul, São Paulo and Santa Catarina, in Brazil.

7) Operations Phase: Maintaining Environmental Management Plan, enforcement of regulations and MLAs requirements, surveillance to prevent traffic other than regular maintenance and as deterrent to colonization. Efforts in obtaining ISO 9000, ISO 14000 and BS-8800 certification.

8) Role of the MLAs and Governments of both countries.

9) Lessons Learned.

Mitigating the Environmental Impacts of the Construction of the Volta Hydro-electric Dams: The VRA Initiatives

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The Volta River Authority (VRA) is an electric power utility with the primary business of generating, transmitting

and distributing electricity in Ghana and to some neighbouring countries. Currently, VRA has constructed two hydro-electric dams on the Volta River, the Akosombo (912 MW) and Kpong dams (160 MW), which has resulted in the formation of the Volta reservoir.

Water available from the Volta reservoir is primarily used for hydro-energy production. Other significant uses of the reservoir are transportation, fishery, domestic purposes, tourism and irrigation. Subsequently, VRA is also responsible for the development of the Volta reservoir by providing facilities and promoting socio-economic development of the Volta basin. This is to ensure a continuous, safe, efficient and competitively priced electricity.

Critical social and environmental impacts of concern to VRA as a result of the construction of the two (2) Volta hydro-electric dams include the following:

- Residual Problems arising out of the Akosombo and Kpong Resettlement Programmes
- Public health
- De-forestation and land degradation along the banks of the lake
- Presence of tree stumps in the water body
- Excessive growth of aquatic weeds on the lake, especially water hyacinth
- The formation of a sand-bar at the Volta estuary and its related health hazards, and
- Pollution by the riverine population

The paper discusses these critical social and environmental impacts and the measures being undertaken by the Volta River Authority to mitigate the undesirable effects and also to improve on the socio-economic status of the people of the Volta basin.

Some potentials of the Volta reservoir like fishery, tourism, transportation and agriculture are also discussed.

Volta River Authority, hydro-electric dams, environmental impact assessment, social impact assessment

Environmental Management for the Handling and Disposition of Plastic Packages of Pesticides (Poster)

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The packages are a symbol of the consumer society, because they are transformed in a waste after their use; in the case of the plastic packages of pesticides, these generate a permanent risk on the health and the environment of the rural Colombian society, mainly by the uses and the final disposition that the farmers can give them, especially when they are used to store foods and/or water; additionally, they are a contamination source, when they are buried or thrown to the water bodies without previous processing.

The plastic packages provide an important source of energy like fuel in furnaces of cement production; this alternative is considered an environmentally appropriate technique, due to its successful implementation in different countries around the world. The continuous growth of the population, demands nutritious security and therefore an increase in the farming production and its protection by means of the suitable use of chemical substances.

In this context, this project has as objective to present the definition of an alternative for the handling and disposition of the plastic packages of pesticides, through actions and coordinated strategies of the public and private sector and the society. The methodology was developed through the formulation of a preliminary program of environmental management of packages of pesticides, identifying the problematic one, the possible involved actors and the development of a test of elimination determining VOCs, metals, dioxynes and furans.

One of the results of this project is that the active participation of the involved actors is very important. It is also necessary to have appropriate technical specifications of the furnace, and mainly that the temperatures should be between 1.100 and 2.000 Celsius degrees, in order to not surpass the limits established at international level.

pesticides, environmental management, hazardous waste, Colombia

Using Indicators in Environmental Impact Assessment and Management

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The environment is a complex system of many and interacting biophysical and socioeconomic components. Therefore, the environmental consequences of development projects, generally composed of many components and activities, are difficult to predict. The environmental management needs an integral and multidisciplinary approach, and faces the problem of analyzing the available information in a process of decision-making that includes different social actors. The environmental indicators, as selected variables that synthesizes the information, may be used to guide the analysis and the management of the environmental information on the ecosystems and on the project under assessment.

In this paper we present a strategy and two study cases, for dealing with the complexity of information management for environmental assessment and project appraisal, using selected environmental and interventions indicators that synthesize the information to improve environmental management. In the first case we apply the indicators approach and a geographic information system (GIS) technology, for the environmental impact assessment of a regional land use planning project that includes recreational and productive activities. In the second case we develop an administrative tool for a preliminary project screening that identifies the needs and scope of an environmental impact assessment of projects at the local scale. Both cases are located in the Andean portion of the Patagonia Argentina. In both cases the indicators are applied both to the project (interventions indicators) and to the geographic area (environmental indicators). This allows development of strategies for project adjustment and the assessment of alternative sites to develop the activities minimizing the environmental impacts. The use of indicators simplifies the management and communications of the relevant information to different audiences and assures the adoption of an integral and multidisciplinary approach, being a valuable tool for those dealing with the environmental management of development project, especially at a local or regional scale.

environmental management, environmental indicators, project appraisal, environmental assessment, geographic information system

Participatory Research as a Means to Achieve Sustainability in the Logging Industry of the Upper Purus River- Peru

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This paper is a follow up of the proposal presented at the IAIA Conference in Hong Kong. The paper presents the results of the participatory research conducted with indigenous populations in the Upper Purus river.

The Upper Purus River Basin, in the department of Ucayali in central Peru, is an Amazon rainforest region populated by native communities. Because of its isolation, the region still has rich biodiversity and valuable timber and forest resources. This timber has been exploited at non-sustainable rates generating serious threats to the natural resources of the area.

The timber extraction activity in the area represents the main economic income for the local people, both indigenous and settlers. However there is a significant illegal extraction, wood taken from native peoples' territories, exploitation of the workforce, a maze of concessions, displacement, migrations and limitations to enforce law. There is a need to develop a viable sustainable solution to this issue.

The Government of Peru, through its corresponding implementing agency, the National Institute of Natural Resources INRENA, is trying to promote sustainable use of the resources in the region. It currently doing extensive research and implementing an EIA to assess the potential influence of new regulations and land zoning. The EIA process is seen as a fundamental factor for the overall environmental management of the project.

An independent contractor will provide for social and environmental baseline data. The research is conducted with the communities through consultation and the promotion of participatory processes that allow the local population to influence the outcome of the project, the design and acceptance of the land-zoning, the promotion of agreed management strategies for the timber activity and the support for the idea of conservation.

This project helps to demonstrate in a pragmatic way the viability of sustainable natural resource management with the participation of indigenous populations, providing a model for the application of similar strategies in other areas appropriate for rainforest regions.

Current Issues of Environmental Impact Assessment in Korea

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Environmental impact assessment (EIA) in Korea has been used to improve environmental conservation and decision-making since environmental impact statement (EIS) was introduced in 1981 with the promulgation of the Environment Preservation Act in 1977, which replaced the Pollution Control Act legislated in 1963. EIA system and methods have developed for sustainable development and stakeholders need.

The EIA system has been improved with the enlargement of project type, public participation, environmental monitoring, and guideline improvement, etc. Environment Preservation Act amended fourthly for regulatory development and the Act was replaced with the Environmental Policy Act in 1990.

Environmental Impact Assessment Act promulgated in 1993 as an independent system. Also the Prime Minister's Decree on environmental review of administrative plan and project enacted in 1993 covered environmentally sensitive project not included in EIA project and administrative plans. Though the Decree introduced policy and plan EIA like Strategic Environmental Assessment, it covered only government projects. In 2000, Prior Environmental Review System based on Environmental Policy Act replaced the Decree. The system covers government and private project. It expects to solve development issues like Lake Shihwa.

Various assessment systems exist in one development project. So stakeholders related to the project want to simplify the process. Impact Assessment Act of Environment, Traffic, and Disaster, etc, which replaced EIA Act was promulgated for satisfying the need in 2001 and its major role is to integrate several assessment acts.

Various methods have been developed to improve the effective implementation of the EIA process. Integrated assessment method of air and water quality model and geographic information system, health risk assessment model on industrial development, rapid assessment for train development through a demilitarized zone (DMZ), cyber

EIA using Internet and map server are being discussed. EIA professional engineer license will be implemented soon for appropriate EIS preparation.

Still, EIA is not fully satisfactory and is sometimes considered an inefficient and superficial tool. Although EIA has improved its formal rules, such as regulations and technical methods, it does not account well for informal rules, i.e., social norms and unwritten codes of conduct, which influence interactions and are based on deep-rooted traditional culture and religion.

environmental impact assessment, strategic environmental assessment, EIA Act, Lake Shihwa, rapid assessment, DMZ, cyber EIA, informal rules

Integrated Environmental Impact Assessment, a Step Towards Integrated Impact Assessment

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Regulatory agencies and developers have to cope with different forms of impact assessment in support of decision making covering the economic, social and environmental aspects of development initiatives. Further, the assessments of these aspects themselves can be broken down into many sub-components: various forms of cost-benefit analyses, risk assessment, ecological assessment, health assessment, gender assessment studies and so on. The diversity of fields and their separate requirements are making effective regulation and well informed decision making excessively complex. There is an urgent need for a truly Integrated Impact Assessment. This paper will outline the search for more integration in conducting impact assessments in The Netherlands. There appears to be good reason for a careful and gradual approach. The economic and social interests are the driving force behind most development initiatives that also have major environmental consequences. As yet, the environmental interest is insufficiently strong to opt at once for a fully Integrated Impact Assessment in which all interests are considered equal. Therefore, as an intermediate step towards full integration, Integrated Environmental Impact Assessment is being developed in which the environmental consequences are tuned with the economic and social motives and consequences of development initiatives.

integrated impact assessment, gradual approach in The Netherlands

Development of Conceptual Models and Tools for the Strategic Appraisal of Policies, Plans and Programmes
(Poster)

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The proliferation of environmental decision-aiding tools is increasingly seen as an obstacle to the development and effective use of policies, plans and programmes to help society move towards sustainable development. For example, the Environment Agency (EA) of England and Wales uses tools and techniques such as EIA, risk assessment, economic appraisal, environmental management systems and life cycle assessment in the policy area of Integrated Pollution Control. However, these tools and techniques are used within distinct disciplinary functions, rather than in an integrated or interdisciplinary fashion. This is considered inefficient (e.g., in data collection), and an obstacle to progress towards sustainable development.

The EA's National Centre for Risk Analysis and Options Appraisal is developing approaches to integrated appraisal of policies, with a focus on balancing environmental, social and economic concerns. In parallel, the Environmental Policy and Management Group (EPMG) at London's Imperial College is promoting understanding of the inter-relationships between decision-aiding tools, and fostering improved linkages between them through the *Journal of Environmental Assessment Policy and Management*. The current doctoral research at EPMG is jointly funded by the EA and the Economic and Social Research Council.

The research aims to understand and clarify the relationships between decision-aiding tools and techniques, and to develop a conceptual framework within which a range of tools can work more effectively. This framework will then be tested using case study examples from the EA's work, leading to recommendations for improving the efficiency and effectiveness of their decision-making processes. It is expected that the framework should have practical value in other agencies, organisations and

government departments that are involved in developing and/or implementing policies, plans and programmes with impact upon the environment and have implications for sustainable development.

strategic, integration, environmental policy, conceptual framework, tools, techniques, approaches, integrated appraisal

Environmental Assessments of Trade Negotiations

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In February 2001, Canada released a Framework for Conducting Environmental Assessments of Trade Negotiations. This paper will provide an overview of the drafting process and the public consultation that led to the release as well as an explanation of how the Framework will be applied to future negotiations.

Background. Canada is now applying the framework to a number of national assessments of trade negotiations, including the agriculture and services talks at the World Trade Organization (WTO) and the Free Trade Area of the Americas (FTAA). The assessments will examine the environmental implications of trade liberalization with a view to mitigating any adverse effects and optimizing the positive effects. The framework establishes a process for undertaking national environmental assessment of trade negotiations with two key objectives: to assist national negotiators integrate environmental considerations into the negotiating process; and to address public concerns by documenting how environmental factors are being considered in the course of negotiations. Given the emerging methodology in this field of analysis, applying the framework presents a number of practical challenges including data limitations, timing issues, and the need to manage expectations while at the same time carrying out broad national consultations. Practical solutions to these challenges will be explored and examined.

trade negotiations, strategic environmental assessment, public participation

Isipingo Story

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This chapter of the Isipingo story begins in June 1995 with IAIA'95 in Durban. The theme on that occasion was "Impact Assessments: Involving People in the Management of Change Towards a Sustainable Future." That theme was embodied and personified by residents of a nearby community, members of the Isipingo Environmental Committee. They joined the proceedings to person a display and present a paper, "Isipingo: The Case for Environmental Impact Assessment and Community Consultation." Afterwards they lead a field trip to acquaint IAIA participants at first hand with their community and its environmental problems, including air, land, and water pollution from urban growth and industrial development in the South Durban Basin. This paper recounts the impact of that experience and projects an alternative future for the community and its environment.

The proximity of industry and community adjacent to unique natural environment presents both problems and possibilities for equitable and sustainable development. Following IAIA'95, some of the participants and local residents conceived of a community based center at the Isipingo Island Hotel to explore ways of protecting and enhancing environmental quality in "productive harmony" with industry and commerce-of combining environmental and economic security and opportunity. Naturally this would involve committed participation of both community and industry. For the sake of equity, interests of the larger as well as the local community would need to be recognized and served.

Thus was the Isipingo Island Institute conceived. To make a long, continuing story short, the formal launch took place on 4 November 2000. Work is now underway on a master plan for institutional and community development and a business plan to sustain that development.

The moral of the story is that IAIA can itself have a direct and beneficial impact by "Involving People in the Management of Change Towards a Sustainable Future." Those people will write the sequels.

community development, community impact assessment, participatory development

A Draft Framework for the Integration of Biological Diversity in Impact Assessment

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The CBD as well as the Ramsar convention have specifically requested the development of guidelines to integrate biodiversity in impact assessment. In recent attempts to develop such a set of guidelines, it became evident that both worlds of impact assessors and biological diversity experts operate in their own realms, having developed their own languages, approaches and methodologies. There is a need for a framework that can accommodate both the predominantly scientific approach of the biodiversity community and the predominantly procedural approach of the impact assessment community. Both the Netherlands Ministry of Foreign Affairs and the Netherlands EIA Commission are working on the development of such a framework, which is intended to provide guiding principles to the development of country-specific guidelines, adapted to the needs, legislation and implementation capacity of each individual country.

The framework consists of:

- A conceptual framework of thinking on the identification of (pathways of) impacts from proposed activities and how biodiversity issues can be highlighted.
- A procedural framework: environmental impact assessment is a highly structured procedure with an internationally accepted number of clearly defined steps. Tasks and responsibilities of various actors in the impact assessment procedure are defined for each step. Biodiversity aspects have to be woven into these steps of the procedure, including the identification of biodiversity-related tasks for each relevant actor

- A legislative framework: How can existing legislation be used in impact assessment, for the conservation and sustainable use of biodiversity, and how should existing IA legislation accommodate for biodiversity issues.
- A format for country specific guidelines. How to use these guiding principles to draft country specific guidelines.

biodiversity, guidelines, conceptual, legislative and procedural framework

Integrating Social Assessment into a Biophysical Research Project

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A research project in the southeastern United States demonstrates how social assessment can supplement traditional approaches to biophysical scientific inquiry. An interdisciplinary research team currently is investigating the factors that control the movement of methyl mercury through the aquatic system of the primary rivers of the Mobile-Alabama River Basin. These factors include inputs from agricultural and urban land uses, impoundments of the rivers, and abundant wetlands. Studies indicate generally increasing levels of methyl mercury in fish tissue, prompting concerns about human exposure to mercury, primarily through consuming contaminated fish. A social assessment conducted with this research project is identifying prominent issues and involving stakeholders towards suggesting public policy approaches to controlling methyl mercury exposure. This research project takes a dual approach to public involvement through social assessment. As stakeholders, recreational fishermen participate in data collection, and a resident expert fisherman advises project management. This activity presents a dual benefit of contributing to the social assessment and improving project management. This process informs stakeholders of the research findings and generates suggestions for policy response. By coupling public participation into the research project orientation, social assessment contributes to a foundation for meaningful public input into the policy making process.

* The primary author serves as a graduate research assistant coordinating the social assessment of an ongoing three-year EPA-funded project.

social assessment, public participation, biophysical research

Regional Frameworks for the Assessment and Management of Cumulative Effects - A Canadian Experience

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A number of initiatives are presently underway in Canada, to look at environmental effects of resource development from a regional perspective. Such regional approaches to environmental effects management have become essential, and their usage is becoming more common in some parts of Canada. A few examples of such regional management frameworks can be found in:

- Canada's Far North (to deal with increasing development of diamond mines and possible future oil and gas pipelines)
- Canada's western provinces (to deal with the proliferation of large tar sands oil extraction industries)
- Canada's East Coast (to deal with increasing exploration and development of offshore oil and gas resources, as well as increasing levels of aqua-culture activities)

Within these regional environmental effects assessment and management frameworks, cumulative effects assessment obviously plays a prominent role, given that many of the impacts of concern in these areas are cumulative in nature.

Such regional frameworks are complex to setup and put into practice, not only because of the ecological complexities inherent within the natural ecosystems that these frameworks encompass, but also because of the large number and diversity of stakeholders that are required to make them work (various levels of government, various industry sectors, community groups, environmental non-government organizations, etc.). Another significant barrier to effective implementation of such regional management approaches is the complexity of jurisdictional and legislative frameworks within Canada.

This presentation will:

- briefly outline some of the geographical areas in Canada undergoing rapid and extensive resource development
- provide an overview of some of the regional frameworks in place for assessing and managing environmental effects, including cumulative effects
- describe some of the lessons learned from these attempts to manage environmental effects on a regional scale

(including how these regional studies and frameworks have helped Environment Canada in reviewing individual projects occurring in those geographical regions)

environmental assessment, regional assessment, cumulative effects

Joint Scoping, Reviewing and Monitoring of the EIA for the Tidal Inlet Project in the Ciénaga De La Virgen Lagoon, Cartagena, Colombia

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The Ciénaga de la Virgen lagoon lies close to the town of Cartagena. Wastewater is discharged directly into the lagoon, and the quality of the water in the lagoon has declined considerably in recent years as a result. There is no longer a permanent open channel between the lagoon and the Caribbean Sea and the self-cleaning capacity of the lagoon has been impaired, leading to environmental and health risks. The lagoon can be restored by creating a 'stabilized tidal inlet' to allow unpolluted seawater to mix with the polluted lagoon water. This would bring the level of pollution back down to an acceptable level.

This project is financed by the Colombian Ministry of Transport and the Netherlands Ministry for Development Cooperation. According to Colombian environmental law and Netherlands environmental policy in the framework of development cooperation, an EIA was required. A joint scoping and review of the EIA-report was performed by the Netherlands Commission for EIA and CARDIQUE (Corporación Autónoma del Canal del Dique, the local environmental authority) to support decision making in both countries.

The execution of the project started in 1999 and CARDIQUE and the Commission for EIA were asked to re-activate their collaboration through following the contents and outcomes of the monitoring programme. The operation of the Tidal Inlet will start by the end of 2000. This paper will focus on the added value of EIA for this project and on the added value of the close collaboration between CARDIQUE and the Commission for EIA.

EIA, development cooperation, Colombia, Netherlands, joint

review

Environment Agency Environmental Impact Assessment Scoping Guidelines

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The Environment Agency's (the Agency's) Scoping Guidelines for the Environmental Impact Assessment of projects comprise a handbook and some 80 guidance notes on individual development types. The notes cover projects as diverse as "camping and caravan parks" to "coastal protection" and from "leather manufacture" to "leisure centres."

The handbook explains the value of scoping, the role of the Agency and the availability and purpose of the project specific guidance notes. The notes include information on key legislation, development control requirements, Agency licenses and authorisations, baseline information and surveys, potential impacts, mitigation measures and relevant guidelines and references.

The guidance is targeted at developers, their consultants, Local Planning Authority staff, Agency staff, and others who are involved in promoting and appraising projects and activities which are likely to affect the environment. It is general in nature and does not replace the need for consultation with the Agency and others on individual projects or reference to more detailed guidance. It is intended to be a starting point to help identify key issues and promote full and early involvement of the Environment Agency and other organisations in EIA. Implementation will be carried out through training of key Agency staff, tying in to Agency policies and procedures, promotion in key journals and through use of the Agency's internet site.

Future developments may include close working with other key stakeholders involved in the EIA process and the collaborative production of guidelines. Close working with contacts in Government on the implications of the forthcoming European Directive on the Environmental Assessment of Certain Plans and Programmes has already commenced. Work is also underway on developing closer linkages between the environmental, social and economic aspects of strategic decision making.

environment agency, environmental impact assessment, scoping

Citizen Values Assessment: An Impact Assessment Tool to Investigate Citizens' Judgements (Poster)

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Scientists' assessments of project alternatives, and sometimes even Social Impact Assessment (SIA) practitioners' expert judgements, can be different to citizens' perceptions about the environmental and lifestyle values of affected communities. Therefore, in Environmental Impact Assessment (EIA), SIA and other planning procedures it is important to take citizens' values into account. Citizen Values Assessment (CVA) is a tool to objectively and systematically investigate the way in which groups of citizens value the qualities of their living environment and to use this information as one of the sources to judge and compare project alternatives in the EIA. It generates a systematic, objective overview of the values that determine the quality of the living environment from the perception of the affected citizens themselves. This profile of citizens' values is used to determine possible impacts of future projects. CVA potentially overcomes NIMBY (Not In My Back Yard) responses that result of interactive processes in which project alternatives are discussed directly with (representatives of) the community. By identifying the key values of the living environment rather than opinions on project alternatives, CVA is not influenced by fear or hysteria generated by project plans. By providing systematic and neutral information based on citizen's values, CVA provides a rational basis for decision making.

Onshore Effects of Offshore Oil and Gas Employment

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Most offshore oil workers spend extended periods, often one or more weeks, at their workplace — usually a production platform or a mobile drilling rig. They then leave the workplace and live at home with their families, if any, for a non-work period that is also commonly one or more weeks.

The offshore accommodations, recreational facilities and food are provided by their employer, which also provides transportation between the workplace and some onshore "pick-up point," commonly a heliport.

This work system was originally developed to meet the needs of the offshore oil industry because daily commuting was not feasible and no "local" workforce or permanent full-time accommodations was available. It is now also used by the mining industry and by other land-based and marine activities in remote and/or hazardous environments, in situations where the local labor force cannot meet industry needs, and where the work schedule makes a daily commute impractical.

Offshore employment should not be seen as inherently problematic — like all other work systems, it offers both advantages and disadvantages for workers, their families and the communities and regions in which they live. Some of the more important of these issues are discussed in under two interrelated categories: human resources and family issues and community and regional issues.

The paper focuses, however, on responses to these issues. It is clear that employer initiatives in such areas as work schedules, accommodations, transportation, communications, hiring, orientation, counseling and family policies and services can optimize the effects of the offshore employment in respect of all of the above issues. Regulatory authorities, trade unions, local government agencies, community groups and others, including the workers and families themselves, may also have an important role to play. Such optimization can have benefits for employers, workers, their families, their communities and, more generally, local society.

offshore oil and gas, commute work systems, social impacts

Towards a Structured Approach to Strategic Environmental Assessment

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Considerable attention has been given to the role of Strategic Environmental Assessment (SEA) in policy, plan and program assessment, however, there is very little consensus on an appropriate methodology for SEA. Two basic perspectives on SEA methodology emerge from the literature: first, that appropriate SEA methodologies are readily available based on the application of project-level EIA approaches to strategic assessment questions and second, that SEA requires a different, more broad-brush, approach than project-level EIA. If SEA is to advance in application and effectiveness, then an appropriate, generally accepted, SEA methodology needs to be established. Despite calls for SEA to develop more independently of project-level assessment, existing SEA methodologies tend to be based on project-level EIA principles. It is argued here that while SEA can perhaps utilize many of the existing methods from project-level EIA, it does require a different, more broad-brush, but structured methodological approach. This paper reviews the current state-of-the-art of SEA methodology, and presents a generic SEA methodological framework and example based on the notion of the "best practicable environmental option."

strategic environmental assessment, SEA, SEA methodology, best practicable environmental option

Strengths and Weaknesses of Biodiversity Integration with National Environmental Assessment Processes

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This paper presents the results of a study carried out by the UNDP/UNEP/GEF Biodiversity Planning Support Program (BPSP) to assess strengths and weaknesses of integration of biodiversity with national environmental assessment processes. The global situation is reviewed and the results of 15 national case study reports are presented. These reports provide information on the process of integrating biodiversity into environmental assessment at the national level in Afghanistan, Argentina, Colombia, Guyana, Uruguay, the Kyrgyz Republic, Romania, India, Nepal, Cameroun, Niger, the Seychelles, South Africa, Tanzania and the Yemen. The paper will also report on a workshop held in Zambia in May 2001 at which the need for guidance on incorporation of biodiversity into impact assessment was discussed.

biodiversity, impact assessment, guidance

Improving Public Participation in Portugal

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Portugal is a Southern European country with a poor tradition of public participation. Democracy was born 25 years ago and Environmental Impact Assessment has been applied for 10 years under the Ministry of Environment's responsibility.

EIA legislation follows the spirit of European Union directives. Rules for different actors are clear and environmental authorities make serious efforts for improving public participation. Relevant information is made available for consultation in central and regional environmental departments, in municipalities and at INTERNET. Announcements are published on newspapers and ordinances are posted at city halls. Until the end of 1999 the contact between proponents and interested populations only happened in public hearings for larger projects.

Statistics show that the average number of opinions received for the EIA process is increasing year by year. Nevertheless, participation is still weak and the quality of contributions is poor. At the same time, a small number of processes focus media attention and degenerates frequently in open conflict, hampering the decision making process.

In the beginning of 2000 the Ministry of Environment conducted a review of methods and results. This analysis led to the identification of critical points, revealing a strong

need of making more friendly information accessible to people. A new public participation procedure was built and began to be applied. Since national NGO seem to demonstrate a limited capacity of EIA participation and because of investments on information technologies could not guarantee immediate results, due to high illiteracy, the new model mainly re-enforces the role of citizens and local authorities. First results are very encouraging.

The story of this experience is reported. A comparison of results in the old and the new public participation model is provided. Difficulties are pointed out and lessons for further development are underlined.

public participation, EIA

Integrating Strategic Assessment in Its Organizational and Decision Making Context

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A recent evaluation of several Dutch national government practices of integrating strategic environmental assessment in policy development and strategic decision making shows that many different factors influence the way professionals and decision makers succeed in dealing with the challenge of an integrated approach. This paper first of all presents the most important factors that were found to be relevant. Apart from methodological and instrumental factors especially the influence of organizational and political context and constraints are indicated.

Policy development is more and more an integrative process in itself. Sectoral ministries have to cooperate to develop comprehensive and sustainable policies. This asks for new approaches of policy development and creativity in applying strategic assessment. The paper illustrates consequences for the classical role of the Ministry for the Environment, indicates promising practical examples of integrated approaches and discusses organizational needs to be obtained in order to improve the practice of integrated strategic assessment on a high policy level.

strategic assessment, integrated appraisal and approaches, policy analysis, public administration, decision making

Systems for Handy and Objective EIA-project Screening. How to Make the "Project Screening Process" Objective? Criteria for the Project Screening in an EIA-procedure.

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The article is a reflection of a study executed in 1999 for the Ministry of Environment in Flanders, Belgium. The study results will be completely updated with additional ideas concerning the further implementation of the approach in daily policy making at the regional government level.

As the European legislation concerning the EIA-procedures evolves further, the Member States try to develop systems to adapt to the Guidelines of the EU. In the new EIA-Guideline the possibility was included to perform a real project screening for a list of projects with potentially significant environmental impacts.

The Flemish Unit EIA has to process a large number of dossiers. To be able to perform an even more objective project screening in the future, a set of evaluation criteria was defined. These criteria had to be in compliance with the existing environmental permitting and master planning legislation. In the study a technique of policy analysis was used and a system of cascading flow charts was implemented to break down the complexity of project evaluation. In compliance with the EU requirements, criteria were used that are linked to the project specifications, to the area in which the project is planned and to the environmental impacts of the project. The third group of criteria was also linked to vulnerability maps that are being developed at this moment by the Institute of Nature Conservation in Flanders. The combination of these criteria allows a further project screening that goes beyond the case-by-case evaluation of projects in the screening phase, which is still mainly the practice in many countries including, e.g., the Netherlands. The method makes the screening process more objective and it fits into the local environmental legislation. This method is a good example of how project screening in EIA can be made operational.

The paper will present the method and the way it was developed to fit into the existing environmental legislation.

In this paper the influence of the study results on the development of new legislation will be included. If possible, as much information as possible about the practical implementation of the approach in daily policy making will be included.

Finally, a link will be made between the operational results of this study and the development of knowledge systems for the screening and scoping phases in the EIA-procedures.

EIA, screening phase, scoping phase, evaluation criteria, environmental legislation, EU

Planning Based on Environmental Analysis in the Municipality of Yamaranguila, Honduras

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In 1998 a Strategic Environmental Analysis was carried out in the municipality of Yamaranguila, Honduras on request of the mayor. There is very little experience with planning in poor, rural municipalities in Honduras and the SEAN served to start a structures analysis and planning process in Yamaranguila, giving the mayor better possibilities to co-ordinate the activities of the different organisations (GOs as well as NGOs) in his municipality.

The Netherlands Development Organisation SNV contracted a Dutch consultant to give methodological support to the SEAN process. The consultant is still involved in the ongoing process resulting from the SEAN, on a voluntary basis.

Yamaranguila has an area of 29,300 ha at an altitude of 800-2220 m, counts 14,000 inhabitants in 36 villages of mainly indigenous Indians, who live on rain-fed agriculture (maize, beans) and some irrigated agriculture (vegetables), although

90% of the area is only suitable for forest. Some 45% of the area is still covered by forest. Yamaranguila is known for its (relatively) good forest management, and in 1997 won a national forestry award.

The objectives of SEAN were:

- Increase the use of natural resources, present in Yamaranguila through investigation of their economical potential, while securing their sustainability.
- Reach better inter-institutional co-ordination within the municipality and create bases for co-operation between different actors within the population.
- Increase the environmental awareness at all levels.

To implement the SEAN an inter-institutional, multidisciplinary team was formed that held workshops in villages and with specialists. Six main themes were identified and elaborated in the Strategic Plan: *Yamaranguila 2020* (food grains, forestry, agricultural diversification, coffee, livestock and urban projects). From this plan a project proposal was written.

Not only documents were the output of the SEAN. Also the process was very important and resulted in the creation of working groups per theme and in improving the participation of the population in the planning processes. The working groups consist of representatives of the municipality, agencies and village organisations who co-ordinate and negotiate future development per theme, that is then supported by the same organisations in a more co-ordinated way, all within the framework of the strategic plan.

SEAN, strategic environmental analysis, municipal planning, Honduras

Strategic Environmental Assessment of the Master Transport Plan in Flanders (N-Belgium)

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Since the change of government in the Flemish region (N.-Belgium) in the beginning of 2000, the minister of transport and the competent authority are working out a master Transport Plan, covering the whole Flemish Region. This plan has five goals: (1) guarantee the accessibility of the Flemish economic nodes and ports, (2) guarantee social justice regarding transport, (3) increasing traffic safety and minimising accidents, (4) increase quality of life, even with increasing transport facilities and (5) minimising the negative impact of transportation infrastructure on environment and biodiversity (nature).

Recently, the transport authority has launched an informal strategic environmental assessment (there is no SEA legislation in Flanders) that should accompany this master Transport Plan. A multidisciplinary group of experts (universities and scientific institutes) was entrusted with the environmental impact assessment, covering the following main issues: air pollution, noise pollution, hydrological aspects, human health, biodiversity, and landscape. This contribution will focus on some major problems and experiences:

- the integration and feedback of the results and suggestions of the SEA into the planning process of the Master Transport Plan;
- how to deal with alternatives and scenarios for such a large scale Master Plan, covering a wide range of decision-making;
- how to deal with public participation and involvement (general public, stakeholders, different authorities, NGOs, advisory bodies, etc.);
- methodological aspects to assess the different scenarios on two planning levels:
 - transport network level: modal choice (modal split), manipulating traffic loads (taxation, categorisation, location economic centres, transport nodes, etc. On this level, general impact, indicators are used describing environmental quality on the

national/regional level (greenhouse gasses, acidification and autrophication, etc;)

- corridor level: location of so called 'missing links' where impact is described by spatial indicators (noise nuisance, habitat fragmentation, landscape perception, local air pollution...)

- how to integrate environmental assessment with socio-economic aspects searching for a sustainable transport scenario
- how to deal with linking different levels of decision-making (tier)

strategic environmental assessment, transport planning, sustainable transport

Social Impact Assessment at the Policy Level

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Although SIA can potentially be applied at the policy level, the practice and accumulated experience of SIA has been at the project level. Most writing and theoretical development has also been at the project level. In the past decade, development aid has shifted from assistance for development projects to a focus on macroeconomic, structural and sectoral policy reforms, and on national or sub-national programs that support these reforms. Policy changes at the macro level can have very significant positive and negative social impacts that materialize over time. The ability to anticipate these impacts can lead to better outcomes and increase the prospects of sustainability by improving program design. Conversely, ignoring social impacts can lead to impoverishment and social tensions that in turn undermine reform objectives. Analyzing the social impacts of policy reform poses a new methodological challenge. There is a need for an analytical framework to identify and predict the social impacts that may result from macro-policy reforms. This paper re-examines and adapts the SIA framework to the context of macro-economic, structural and sectoral policy reforms. It also considers how

the potential variables considered in SIA may need to be expanded for the adaptation of SIA from project to policy, from negative impacts to positive benefits, and from unintended to intended consequences of development interventions.

social impact assessment, policy assessment, structural adjustment, development

Health Impact Assessment and Intersectoral Policy at National Level in The Netherlands

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In 1996 the Department of Intersectoral Policy (DIP) was established within the Netherlands School of Public Health (NSPH) by the Minister of Health (MOH). The assignment was to develop and experiment with HIA as an instrument for intersectoral policy of the MOH. Two main tasks: conducting/co-ordinating HIA and developing expertise regarding intersectoral policy (including methodology).

The Working Programme 2000-2001* of the NSPH-DIP consists of the following activities: further development of the systematic approach for screening (case-finding) and scoping; conducting/commissioning HIA; strategies for intervention (HIA follow up); network of experts; digital applications (HIA-Checklist, HIA-Database, Keyword development); other impact assessments; local health policy. HIA reports: Energy Tax Regulation (Ecotax)*; High Speed Railway; Tobacco Policy (2 HI Screenings, 1997, 1 HI Analysis, 1998); Alcohol & Catering Act; Reduction of the Dental Care Package*; National Budget 1997 / Annual Survey of Care; Election Programmes Political Parties; Housing Forecast 2030*; ICES ("Operation Interdepartmental Commission for Economic Structural Reinforcement") (2 reports); Identification of policy areas influencing determinants of five major health problems*; Coalition Agreement 1998; Occupational policy and health impact screening*; National Budget 1999; Regional Development Policy (pending); National Budget 2000*; Housing Policy (in process); National Budget 2001 (in progress).

Based on the Evaluation Report (1999), the report of the Dutch Council for Health and Care (2000)* and other relevant reports the Dutch Ministry of Health will reconsider its policy up till now and will write a new programme for the

future regarding intersectoral policy and HIA.

* Full translation available in English.

Design Principles for Developing Guidelines for Modelling Indigenous Impact Assessments

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Many guidelines for assessing environmental impacts exist. Agencies and organizations involved with developmental aspects use guidelines routinely for assessments of projects. These guidelines either directly or indirectly involve indigenous people. As these guidelines find universal acceptance two aspects need close attention. First, guidelines need to be analysed to determine how effective they are in enabling indigenous people to participate in impact assessments. Second, there is a need to develop guidelines for explicitly modelling indigenous impact assessments. This paper is concerned with the second aspect.

The objective of this paper is to identify the design principles for developing guidelines for indigenous impact assessments. The first section of the paper provides taxonomy of existing guidelines. The second section of the paper discusses the criteria for selecting a subset of existing guidelines to decipher the principles underlying their design. The third section analyses a number of strategies - characteristic specification, bench marking, strategic perspective analysis, case study approach, field testing - which potentially could be adopted for creating indigenous designing principles. The final section proposes an agenda for further action for developing guidelines for modelling indigenous impact assessments.

guidelines, indigenous assessments

Adopting Sectoral Environmental Guidelines as a Preliminary Environmental Assessment Tool for Project Development in Colombia

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Considering the fact that EIA is an on-going process of review, negotiation and incremental decision making, culminating in an essential political action of making a decision whether or not a project proposal could proceed in certain given conditions, the Ministry of Environment of Colombia in the past couple of years developed the initiative to formulate and adopt through a shared formulation process between industry associations, academic reps and specialized consultants, production sectors' environmental management guidelines, which to date could be considered as the minimal acceptable environmental practices to be followed in project activities by the different interested parties.

The refereed Guidelines (32 specific ones developed to date) comprise the basic conceptual, methodological and procedural criteria to be followed by each interested party, while implementing activities at several project types, in different production sectors such as mining, electric, petroleum & gas, transportation projects and urban settlements.

The goal to achieve in the following two years will be to develop and adopt additional basic environmental guidelines in key sectors such as agriculture (17 in total), health activities, cement industry and specific industrial activities, considering the important value given in terms of cost reduction, projects unified criteria for evaluation and follow up and project adoption of minimal acceptable environmental practices by productive sector, leaving final decision making to regional and territorial aspects, instead of sector definitions.

guidelines, project environmental management, minimal acceptable environmental practices

Taking It To The Streets: Tying Together The Educational and Service Missions of an Urban University With an Active, Applied Community Research Center

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Following the lead of many critics of Higher Education, Ernest Boyer embarked upon redefining the role of Colleges and Universities, particularly those institutions outside of the Research I and Research II Carnegie classifications. A number of new faculty in smaller universities, many of whom were trained as researchers (as opposed to merely teachers), often find that employment in non-research-dominated universities prevents professional growth due to demands placed on direct instruction. In this paper, we present a base study of an applied sociological research center at a medium sized Urban University in Florida that has been particularly successful in its efforts to combine the academic and service components of the University's mission with the applied, as well as more traditional academic research. Over the past 5 years nearly \$1.4 million has been obtained in applied contract research, involving a dozen faculty, with over 50 students (undergraduate and graduate) employed on research projects, and over 300 student volunteers participating. Projects have included Assessing the Impact of an Inner City Minority Infant Mortality Reduction, Prison Reform, Adolescent Pregnancy Prevention Program Assessment, research on homelessness, and the evaluation of a number of juvenile crime prevention

programs. In all cases, research team members work directly with persons directly affected by the research to insure community participation. In addition, faculty associated with the Center have used the projects from the center for classroom based learning activities as well as community service based learning processes.

urban research, evaluation, community action research

Indigenous Peoples and the Convention on Biological Diversity – “Article 8j”

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The Convention on Biological Diversity, initiated in 1992, has been acceded to by 180 nations, more than any other global convention. Article 8(j) of the Convention recognizes the need “to respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity” and promote their wider application. This Convention is highly relevant to the practice of environmental impact assessment, because its wide global acceptance puts it in the lead in establishing the principles of international law regarding indigenous peoples and their relationship to their homelands and knowledge. The Convention is strongly influencing the implementation of national legislation regarding the access to traditional knowledge and mechanisms for sharing the benefits of its use. More importantly, the Convention is also helping to change the status of indigenous peoples in regards to natural resource management by influencing standards for research, planning and development.

In my presentation, I will review the decisions of the recent Conference of the Parties (COP), and their relevance to impact assessment. I will also review the structure of the Convention and how it works through the passage of decisions, national implementation and development of programs of work and international cooperation. I will emphasize the role of these decisions regarding the meaningful participation of indigenous peoples in all issues that concern them, the role and need for strengthened communication and transparency. I will examine the Convention’s support for ecosystem management for the conservation of biodiversity and traditional knowledge, and address the co-management role that indigenous peoples play in this process.

indigenous peoples, biodiversity, Convention on Biological Diversity, Convention on Biodiversity, Article 8j

The Project Description: A Difficult but Critical Step in EIA

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Accurate impact predictions require understanding how each aspect of a project will affect different resources. If impact-causing activities are not fully described, impact studies will not be focused properly, and predictions may be wrong. A common EIA failing is that project designers are not aware of all the ways in which a project may meaningfully affect the environment. As a result, the information provided to EIA preparers often is insufficient, and important impacts are ignored or misrepresented. The EIA team must be detectives to extract ALL important facts about how a project will cause change. Investigation of what actually happened at an analogous facility can help determine what is important.

A good project description begins with recording essential information about “who, where, why, and when.” This means using functional terms to describe the project’s owner, operator, purpose and need; using natural systems terms to describe location; and using human/ecological behavior contexts to characterize the phasing/timing of project planning, construction, operation and closure. Maps showing each project facility are essential, especially locations of material/energy inputs and outputs; and there should be a complete inventory of all activities to monitor, minimize or mitigate impacts.

The core of the description is the “what, how, and how much” of the project. Many checklists exist that identify impact-generating activities for particular project types, but the EIA team must make independent judgments to ensure accuracy and completeness. This presentation will illustrate one approach, the “functional checklist,” which directs the EIA team to consider the project in terms of “forces for change,” “materials balance,” and “form and flow.” Forces for change means considering the consequences of each project input that makes things happen, such as machinery, power, labor and capital. Materials balance means a full inventory of materials used to construct and operate the project; and a corresponding accounting of all outputs, especially waste products. Form and flow means understanding each physical change to the landscape caused by project activities, and how off-site resources are modified. Quantification (dimensions, rates, mass, concentration) is essential for good project description.

project description, EIA methods, checklists

**Impacts of a Large Wildfire on a Nuclear Laboratory:
 The Cerro Grande Fire, Los Alamos, USA** (Poster)

Wilson, Lee

In May 2000 a “controlled” wildfire swept through part of Los Alamos, New Mexico (USA), and burned nearly 20,000 hectares. Because the fire affected one of the world’s major nuclear laboratories, the impacts of this disaster were extraordinary. Total damages and recovery costs for a relatively small area may approach one billion dollars.

Direct effects of the fire. The fire destroyed 202 homes, left another 200 families homeless and turned an attractive woodland neighborhood into something resembling a war zone. Nearly 20,000 persons were evacuated and forced into temporary shelter. Businesses lost several weeks of income. Work was halted at the laboratory; possible breaches of national security occurred at this time. EIA-based planning prevented loss of key lab facilities, but most had soot and smoke damage. Years of scientific data were destroyed, and many environmental monitoring stations were lost. The fire scorched waste disposal areas, giving rise to fears about toxic fumes. Air quality data show increased radioactivity during the fire, which may reflect natural combustion.

Effects of post-fire runoff and sediment transport. Much of the heavily wooded and steeply sloping watershed west of the city was denuded by the fire, and fire ash caused a marked reduction in soil permeability. As a result, the estimated flood runoff and sediment production from these watersheds increased by an order of magnitude. Large storms are predicted to cause unstable channel conditions with the potential to undermine and/or overtop existing facilities, including some containing critical nuclear materials. There also is the risk of transport of contaminated sediments from on-site waste areas to downstream areas occupied by Native Americans.

Effects of fire suppression and post-fire activities. Large amounts of labor, energy, chemical and water resources were committed to fire control. An intensive program of watershed rehabilitation was initiated even before the fire was out. Large amounts of rubble from burned areas had to be disposed. A trailer park was built for those whose homes were lost, and large amounts of government aid were provided to those affected persons who are U.S. citizens. More than 2000 waste material sites on lab property were assessed and hundreds were selected for site-specific protection against erosion. In flood-prone areas, critical nuclear materials were relocated, some vulnerable lab facilities were demolished, and contaminated sediments were removed. The most spectacular of several flood protection measures was a large dam costing more than \$8M that was designed and constructed in less than 90 days.

fire impacts, radioactivity, waste disposal sites, flood control

IAIA International Study on the Integration of Environmental, Social and Economic Issues in Spatial Planning. Case Study of the Metropolitan Spatial Development Framework (MSDF), Cape Town, South Africa

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The Metropolitan Spatial Development Framework (MSDF) for Cape Town, South Africa, was selected as a case study for the IAIA international study on the integration of environmental, social and economic issues in spatial planning. Initiated in 1991, the MSDF was the first planning exercise which attempted to redress the city structure in order to reverse the legacy of the past apartheid ideology. The MSDF process took into account the unique environment of the Cape, its people and the economy, whilst the plan itself was prepared during a period of political, legislative and social change. An environmental evaluation was done at a metropolitan level, which gave the MSDF a new environmental dimension. This evaluation is examined in the context of the spatial planning process and the various forms of integration provided by the case study template. The case study shows that some substantive, methodological and procedural integration was attempted, although these were constrained by low levels of institutional and policy integration. Policies and procedures for Integrated Environmental Management (IEM) and later legislative requirements for Environmental Impact Assessment (EIA) emerged separately from the MSDF spatial planning process. To-date, the MSDF has not achieved its broad goal of becoming a statutory plan, although it is being implemented in some areas and sectors of Cape Town. This uneven implementation is a consequence of uneven institutional integration, including the separation of spatial planning and EIA processes. The case study has shown that institutional integration is required at the higher conceptual and policy levels of spatial planning if substantive, methodological and procedural integration is to be achieved at lower, more detailed sub-area planning or project level approval.

The Use of Environmental Permit to Ensure the Undertakings Recommended in Environmental Impact Assessment

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To different EIA processes, there are many common features, such as, systematic, structured and well-documented assessment of the environmental impacts of a project. In practice, it is a complicated issue to follow through the findings and recommendations in the EIA reports in order to achieve the planned objectives in avoiding, preventing and mitigating the adverse impacts due to the implementation of the project. In Hong Kong, since the enactment of the EIA legislation, it is a statutory requirement for all designated projects to obtain an environmental permit (EP) before the commencement of construction of the project. This paper discusses the permitting system of the Hong Kong EIA Ordinance and the enforcement strategies for an effective and efficient implementation. In addition, the EIA process publicized in the INTERNET providing all details of the issued environmental permits for public access is also discussed. In the paper, the likely on-line development of environmental monitoring of projects is outlined.

environmental impact assessment (EIA) process, designated projects, environmental permit, Internet

Building Biodiversity into Private Business: Kafue Fisheries Ltd., Zambia

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This paper explores the role of private business in safeguarding and promoting the conservation of biodiversity. Based on experiences in owning and overseeing a sustainable agricultural enterprise in Zambia, common principles and indicators are identified that could be used to raise awareness of how private businesses can contribute. Potential barriers to building biodiversity into business are also explored.

The presentation introduces Kafue Fisheries Ltd., a privately owned and operated commercial venture in Zambia that has been in existence since 1981. Kafue Fisheries includes an integrated pig and fish farm, a tourist lodge, and a game farm. Approximately 40 of the 1800 hectare site is used for the pig and fish operations and the remaining land provides a variety of habitats for the wildlife on the game farm. Kafue Fisheries promotes agribusiness, eco-tourism, biodiversity conservation, and ecological restoration in support of sustainable development.

The implications of commitment to being a "biodiversity business" are not fully understood. Komex International Ltd., through its ownership of Kafue Fisheries, is exploring this concept by developing a set of indicators that will be applied to the future management of Kafue Fisheries. Responsibility for conservation of biodiversity at Kafue Fisheries is being integrated into core business strategies and objectives. Insights into what being a biodiversity business means for Kafue Fisheries will be offered. Examples will include measures that conserve biodiversity yet balance private sector business objectives. Key recommendations to enhance business commitment to the principles of a biodiversity business will be presented.

biodiversity, private sector, sustainable development, corporate environmental commitment, business

Isolated and Recently Contacted Indigenous Peoples in the South East of the Peruvian Amazon: Social Assessment and Recommendations for Their Survival

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Around a dozen small indigenous groups currently inhabit the most remote upper areas of the basins that formed the south east of the Peruvian Amazon (near the borders of Brazil and Bolivia). They are the isolated survivors of the rubber boom era (1880-1920). This paper is the result of a social assessment carried out at various stages of fieldwork between 1977 and 1997 and is based also on secondary sources provided by other scholars as well as by the peoples and institutions living and working in this region. The paper attempts to present a summary of these findings and aims at raising awareness about the current situation of these highly vulnerable groups. Initial remarks are devoted to the perceptions that have been elaborated around these groups. This is followed by a brief introduction to the region's historical background, focusing on the kind of social and economic activities that have been developed in the past. This part finalizes with a presentation of the current dilemmas these groups are facing and their alternatives for survival. A brief ethnographic description of the isolated indigenous groups -and of those recently contacted - living in the headwaters is provided. This section includes estimated demographics, approximate locations and territories under use, basic cultural adaptive features, ethnic identities, linguistic classifications and a brief historical background. A critical review of their relationships with other social actors is presented. A discussion follows on their legal status and the current impacts that are being produced in their surroundings. The presentation finalizes with a set of recommendations addressed to the main social actors, the private sector and the institutions involved (including the various sectors of government), that aimed at contributing to the enforcement of their rights, their well being and their survival.

Amazon basin, isolated indigenous peoples, Peru, social impacts

SEA in the CR - Experience, Open Issues, Background

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Since the first SEA of a national strategy (1998-National Policy of Energy) was performed, strategic environmental assessment in the Czech Republic has moved from the stage of individual search for forms and tools of assessment in each case to a stage of approach consolidation and design of uniform guidelines for strategic environmental assessment.

The key issues that emerged in the period 1998-2000 and which had to be solved include:

- Assessment initiation mostly after the strategy was designed.
- Possibilities and constraints of co-operation between developer and assessee.
- Competence and authority of assessing team.
- Varying quality of elaboration in strategies (like concreteness of development ideas, quantification of indicators, territorial projections, time schedule).
- Relations of concepts (superior-subordinate, national-regional, multisectorial-sectorial).
- Unavailability of necessary data for assessment.
- Forms of evaluation and assessment of impacts.
- Ways of public involvement into the assessment and treatment of their opinions and comments both on the strategy itself and its environmental assessment.
- Proposals of monitoring and postproject analysis.
- Integration of results into the final wording of the strategy (way of SEA implementation, measure of obligation for permitting authority).
- Concurrence of SEA of a strategy and the EIAs of projects implementing this strategy, measure of obligation of SEA statement for individual projects' EIAs, assessment of realisation of relevant projects and EIA conditions determining them, and measures for updating the strategy in an adequate time horizon (closing the SEA-EIA-SEA cycle and its "spiralisation").
- The role of public in the stage of a strategy implementation, including the control of SEA conclusions.

With the view to the number of assessed and approved concepts in a relatively short time (1998-2000), more than 10 concepts varying in their sector scope) the most important issue that has emerged consists in identification of mutual links of those concepts and strategies. Finding a solution to

this seems very urgent both for elaboration of the strategies themselves and their environmental assessment as well. The experience has shown so far that in implementing the strategies there occur ambiguities and disputes on superiority or validity of a concrete part of an approved strategy as a result of a conflict with another related strategy.

The situation can be illustrated by the sectors of transport and agriculture, which are covered by numerous concepts and strategies with variable inter-relationship within and between the transport and agricultural sectors.

Just the effort to practise the principles of monitoring of an approved concept implementation and to practise post-project analysis together with the tendency to relate cyclically SEA-EIA-SEA in an "endless" spiral show this issue was neglected in the past and it is sure to complicate accomplishment of the approved concepts both now and in a near future.

SEA, EIA, policy, programme, transport, agriculture, environmental protection

Biological Assessment – An Environmental Impact Assessment Tool

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In elaborating the environmental impact assessment documentation there is a key chapter dealing with description of the present state of fauna, flora, ecosystems, and natural environment as a whole likely to be affected by the assessed project and then assessment of the impact on biota, ecological relationships, and the whole natural environment. Based on the ten-year-long practice in EIA the applied approaches can be classified as two fundamental ones:

- Exploitation and assessment of data existing within databases of nature protection authorities and organisations.
- Territory survey by own efforts and then assessment of obtained data.

The first approach can only be applied to a project that is going to be realised in a long monitored territory or the considered project can be presumed – on the experience so far – not to have an important environmental impact.

The second approach is necessary namely in case the data on nature characteristics are not available and namely in case of a project the scope and character of which is likely to affect the present environment very much. Such approach – so-called “biological assessment” – is established legally at the Czech Nature and Landscape Protection Act (No. 114/1992). The right to require the biological assessment belongs to nature protection authorities. If the biological assessment is imposed, the authority cannot issue a permitting decision before receiving the conclusions of the assessment.

The biological assessment namely contains a report on identification, description, and evaluation of the present conditions of the likely affected biota, habitats, and landscape and likely direct and indirect impacts of the developer’s intended use of the landscape from the view of impact upon flora and fauna and their habitats. The assessment deals with the whole lifetime of the project (implementation/construction, use, removal, waste disposal), as well as comparison of possible alternatives of the intended intrusion and identification of the optimum alternative.

The practice of implementing the biological monitoring so far has shown methods of this tool of environment protection have not consolidated both screening and scoping.

A new proposed guideline for biological assessment targets a solution to the issues in order to provide a uniform approach to assigning and elaborating the biological assessment and application of the results in exercising other environment protection instruments like strategy environment assessment or territory development planning or construction permitting procedure.

biological assessment, EIA, biota, fauna, flora, habitat, landscape, natural environment

Index by Key Word

A

accelerated urban growth 61
 acidic compounds 56
 action/work plan 5
 adaptive environmental management 53
 Africa 5
 agriculture 86
 air quality 55
 Amazon basin 85
 ambimorphological approach 11
 analytical tools 55
 approaches 72
 Article 8j 82
 assessment 5, 9
 assessment for liability or compensation 5
 auditing 53
 Australia 10
 Austria 10, 62

B

Bahrain 37
 Barranquilla 9
 Bayelsa State 56
 best practicable environmental option 76
 best practice 53
 biodiversity 12, 31, 40, 55, 73, 77, 82, 85
 biodiversity conservation 51, 64
 biological assessment 87
 biophysical research 73
 biota 87
 biotechnology 62
 business 12, 85

C

Canada 55
 Canadian Environmental Assessment Act 29, 66
 capacity 5
 capacity building 33
 carrying capacity 65
 case studies 34
 cassava 62
 categorisation 50
 CEAA 29, 66
 Central and Eastern Europe 22
 checklists 83
 Chile 16, 17, 65
 cities 35
 citizen engagement 24
 citizens values assessment 34
 climate change 55
 coastal tourism 14
 Colombia 9, 36, 62, 69, 75
 community action research 82
 community centers 33
 community development 6, 72

community impact assessment 6, 72
 commute work systems 76
 company 31
 complexity 54
 compliance monitoring 45
 comprehensive regional assessments 10
 conceptual 73
 conflicts 16
 conservation 10, 40
 Convention on Biodiversity 82
 Convention on Biological Diversity 82
 conventions 55
 corporate environmental commitment 85
 costs and benefits 62
 costs of breeding 59
 countries in transition 22
 cumulative effects 74
 cumulative effects assessment 26, 66
 cumulative impacts 18
 cyber EIA 71

D

decentralization 9
 decision making 77
 decision sciences 54
 decision-making 35, 53, 54, 60
 decision-making theory 15
 delegation of powers 56
 democratisation 22
 deprivation 56
 design 14
 designated projects 84
 developing countries 33
 developing country EIA 66
 development 5, 9, 30, 80
 development cooperation 75
 development of environmental impact assessment training
 programm 39
 devolution 13
 dissolute neglect 56
 district 9
 DMZ 71

E

EA of large scale projects 22
 eco-physiographic elaboration 42
 ecological flow 32
 economic incentives 34
 ecosystem approach 31
 ecosystems 48
 ectomorphological approach 11, 20
 Ecuador 30
 EIA 16, 19, 20, 28
 30, 42, 45, 47-50, 65, 75, 77, 78, 86, 87
 EIA Act 71
 EIA and EU pre-accession process 39

EIA diploma course 39
 EIA follow-up 53
 EIA methods 83
 EIA process 29
 EIA report 5
 emissions 55
 EMS 49
 energy 55
 energy industry 48, 49
 England 13
 environment 15, 34, 37, 64
 environment agency 75
 environmental 5, 9
 environmental and regional planning 32
 environmental and social assessment 38
 environmental assessment 12, 22, 38, 39, 64, 69, 74
 environmental assessment of trade 16
 environmental audit 31
 environmental auditing 19
 environmental degradation 5
 environmental due diligence 31
 environmental impact assessment 26, 32, 35, 36, 40, 53, 62, 68, 71, 75
 environmental impact assessment (EIA) process 84
 environmental impact assessment process 8
 environmental impact assessment reports 8
 environmental impact assessment systems 8
 environmental impacts 9, 14
 environmental indicators 69
 Environmental Information System (EIS) 54
 environmental legislation 78
 environmental legislation and auditing 29
 environmental management 19, 69
 environmental management plans 49
 environmental management systems 19
 environmental performance 49, 72
 environmental permit 84
 environmental policy 61, 72
 environmental practices 31
 environmental protection 61, 86
 environmental remediation 7
 environmental reporting 19
 environmental review 40
 environmental risk potential 41
 EU 78
 evaluation 53, 82
 evaluation criteria 78
 exploration of crude and natural resources 56
 expressway impacts 51

F

fauna 87
 feasibility 50
 fire impacts 84
 fish habitat 32
 flanking measures 45
 flood control 84

flood damage mitigation 46, 47
 flood of 1997 47
 flooding 46
 flora 87
 follow up 49
 follow up studies 66
 follow up studies 66
 follow-up 12
 food processing 46
 foreign investment 17
 forest management 7
 forest sector 17
 forests 10

G

gender balanced social development 33
 gene technology 10
 genetic modification 52
 genetically modified organisms (GMOs) 10
 geographic information system 36, 69
 geographic information systems 35
 geographical information system analysis 29
 GIS 35, 48, 77
 GMO 52
 gradual approach in The Netherlands 71
 Graz 10
 "green" certification 34
 guidelines 42, 73, 81

H

habitat 87
 habitat-fragmentation 29
 habitat-loss 29
 hazardous waste 69
 health 15, 37, 48
 health diagnosis 30
 health impact assessment 30, 52
 healthcare 24
 HIV/AIDS 64
 Honduras 79
 Hong Kong 11, 41
 hydro-electric dams 68
 Hydro-Québec 31, 32
 hydroelectric power plant 32
 hydroelectric utilities 31
 hypo-chondriasis 11

I

IA 29
 ibex 37
 impact 5, 9, 31
 impact assessment 37, 77
 impact assessment methods 59
 indicators 10, 31
 indigenous assessments 81

indigenous peoples	7, 82
industrial countries/developing countries	25
industry/energy company	41
institutional strengthening	33
integrated appraisal	72
integrated appraisal and approaches	77
integrated assessment	10, 34, 47
integrated costal zone management	14
integrated impact assessment	71
integrated water resources management	57
integration	9, 32, 60, 62, 66, 72
integration for natural and social components	25
integration of socioeconomic impact assessment to environmental	25
internal communications	23
Internet	84
ISO14001	49
isolated indigenous peoples	85
Italy	14, 32

J

joint review	75
judging project alternatives on the basis of citizens values	35
judicial consideration	55

K

Kluckhohn	24
knowledge generation	47
knowledge sharing	29, 65
Korea	40

L

Lake Shihwa	71
land development	34, 42
land use planning	65
landscape	50, 87
landscape ecology	15
large scale projects	48
Latin America	31
Latin American countries	8
laws	9
legality and interpretation	56
legislative and procedural framework	73
lessons learned	57
life cycle assessment	19
linkages	5
links	13, 28
Local Agenda 21	10
local community	31
local government	13

M

management functions	23
mangrove systems evolution	62

Manual	34
manufacturing	46
marginalisation	56
marine assessment	45
marine habitat	18
market reforms	22
master's degree program	61
mesomorphological approach	11
methodology	32, 45
methodology for socioeconomic impact assessment	25
migrant neighborhoods	33
mine development	26
minimal acceptable environmental practices	81
Ministry of Environment	36, 62
mitigation	12, 48, 53
mitigation measurements	29
monitoring	12, 53
monitoring program	9
monumental environmental devastation	5, 56
municipal planning	79

N

national policy of environment	5
national policy	5
native forest	17
natural environment	87
natural resource management	59
NEPA	18
Netherlands	75
New Zealand	52
New Zealand; projects	52
NGOs	33
Niger Delta	11
North America	46
Norway	47
nuclear energy	50
numbers of species	40

O

offshore oil and gas	45, 76
oil & gas projects	48
oil and gas exploration	37
oil exploration licence	56
oil industry	7, 38
oil mining lease	56
oil sector	62
on-farm	62
organization development	23
overhead transmission lines	48
overview	34

P

participatory development	6, 72
participatory planning	29
percolation	15

Peru 85
pesticides 69
petroleum 47
physical planning 50
pipeline corrosion 56
planning 9, 66
policy 12, 86
policy analysis 77
policy and planning tools 55
policy and political context 15
policy assessment 80
PRA report 5
practice 28, 65
practices 52
private sector 85
procedure 65
process 62
professional practice 53
programme 86
project appraisal 69
project description 83
project environmental management 81
project monitoring and evaluation 58
projects 41, 52
psycho-morphological impact assessment and crises
 management 11
public 50
public administration 77
public international agricultural research 59
public involvement 58
public participation 16, 17, 23, 24, 35, 64, 72, 73, 77

Q

quality assurance 20

R

radioactivity 84
range management 37
rapid assessment 71
rapid propagation 62
rationality 54
Red River of the North 46, 47
regional assessment 74
regional environmental assessment 57
regional forest agreements 10
regional hypocorndiases 56
regional post traumatic stress disorder 56
regions 13
regulation 10, 56, 59
reliability 41
reserved flow 32
resource consents 52
resource control 56
resource sustainability 64
resources 25
restoration 46

risk 55
risk analysis 41
risk assessment 10, 59
risk management 10
river basin planning 58
road impact 30
role of SEA 15
routeing 48
Royal Commission 52
rural industry 46

S

Santa Marta 9
science 53
scooping phase 78
scoping 29, 48, 50, 65, 75
screening 9, 29, 65
screening phase 78
SEA 15, 19, 28, 30, 35, 43, 44, 50, 55, 60, 62, 66, 76, 86
SEA 13
SEA methodology 76
SEAN 79
sensitive area 45
SIA-methodology 35, 52
smog 55
social assessment 45, 73
social impact assessment 16, 35, 68, 80
social impacts 76, 85
socioeconomic impacts 25, 46
spatial 9
spatial planning 35, 43, 44, 60
species loss 40
stabilization ponds 9
strategic 15, 72
Strategic Action Program (SAP) 54
strategic assessment 77
strategic environmental analysis 79
strategic environmental assessment 10, 12, 13-16, 35
 38-40, 54, 55, 57, 62, 65, 71, 72, 76, 80
strategic impact assessment 58, 59
structural adjustment 80
Styria 10
submarine outfall 9
submissions 52
sustainability 12, 15, 34, 35
sustainability impact assessment 33, 45
sustainability 34
sustainable development 5, 10, 32, 60, 85
sustainable transport 80
synergistic effects of velocity and volumetric flow 56
systems thinking 13

T

tactical/strategic frustration 56
taxonomy 40
techniques 72

Temelin	50
termination revocations	56
thermal utilities	31
tiering	30
tools	72
trade	25, 34
trade agreements	25, 45
trade and environment	16
trade impacts	33
trade negotiations	72
transboundary cooperation	47
Transboundary Diagnostic Analysis (TDA)	54
transgenic crops	59, 70
transport	86
transport planning	30, 80
transportation planning	29
tri-partite dialogue	7
true federalism	5, 56
Tumen River	54
TumenNet	54
Turkey	33

U

uncertainty	55
unitary system of government	5
University of Debrecen Hungary	39
urban	32
urban development projects	61
urban environment	48
urban infrastructure	35
urban planning	15, 16, 61
urban research	82

urban studies	48
urial	37
USA-Canada	47

V

valuation	55
value orientations	24
values	24
vector borne diseases	30
Volta River Authority	68
vulnerability	50
vulnerability impact assessment	29

W

waste disposal sites	84
wastewater	9
wastewater system	41
wastewater treatment	9
wastewater treatment plant	9, 14
West Siberia	38
wetlands	46
white-water activity	32
wild ungulates	37
wildlife monitoring	37
wood production	10
world trade	33, 45

Z

zoning	55
--------------	----

Index by Author

A

Achimota, Dickson 5, 11
 Acosta, Israel 6
 Acosta, Patricia 6
 Acquah, P.C. 5
 Akioosi, Adriano 60
 Akpofure, E.A. 5, 6, 11, 55, 56
 Alba, Eleodoro Mayorga 7
 Alkuwari, Zahwa 37
 Alzina, Virginia 7
 Amoyaw-Osei, Yaw 8
 Appah-Sampong, E. 8
 Arteaga Núñez; Francisco 9
 Arts, Jos 52
 Aschemann, Ralf 9
 Ashe, John F. 10
 Au, Elvis 11
 Audouin, Michelle 11, 66
 Ayawei, Prosper 11

B

Badu-Yeboah, K. 8
 Bagri Athanas, Andrea 12
 Bailey, John 53
 Baker, Jill 12, 52
 Barker, Adam 13
 Bartlett, Samuel R. 13
 Bekhechi, Mohamed A. 67
 Belgiorno, Vincenzo 13
 Bettini, Virginio 14, 32
 Bina, Olivia 15
 Birley, Martin 15, 37
 Blanco, Hernán 15, 16
 Blok, Henk 37
 Blum, Juan-Carlos 44
 Bocchetto, Marcela 17
 Bonilla, Juan Pablo 18
 Borregaard, Nicola 15
 Brathwaite, Farley 20
 Brito, Elizabeth 18
 Britto, José Carlos 60
 Brookes, Andrew 71
 Brown, A. L. 19
 Brownlie, Susan 19
 Bryan, Hobson 73
 Burdge, Rabel J. 20

C

Caldwell, Paula 52
 Canter, L.W. 21
 Cardenas, Marco V. 47
 Chambers, Adam 17
 Cherp, Aleg 21
 Christie, Ryerson 22
 Collinsworth, Stephen R. 22

Colvin, Mark 64
 Connor, Desmond M. 23, 24
 Conover, Shirley A.M. 24
 Correa, Elena 25
 Creasey, Roger 22, 25
 Croal, Peter 26, 65
 Curran, Johanna 33
 Cushing, Katherine Kao 57

D

da Luz, Edio Laudelino 27
 Dani, Anis 27
 Dani, Anis Ahmad 80
 de Boer, Jan Jaap 28
 de Kergommeaux, Davin 28
 de Londono, Nora Ruiz 58
 de Schutter, Joop 29
 Defloor, W. 29
 den Broeder, Lea 80
 Déry, Louise 44
 Di Nota, Flavia 14
 Diaconu, C. 57
 Dobos, Rob 12
 Dufey, Annie 15
 Duru, Sampson 11
 Duthie, David 76

E

Eggenberger, Markus 60
 Emanuele, Snidaro 14
 Escobar, R.H. 62
 Eshiemoge, Stanley 11
 Espinel, Mauricio L. 30
 Espinoza, Guillermo 8

F

Fakhro, Khalid 37
 Ferreira, Gustavo Loiola 60
 Field, Donald R. 20
 Fischer, Thomas B. 13, 30
 Flynn, Diana 85
 Flynn, Fergus 85
 Franklin, Kevin C. 30
 Fuggle, Richard 19
 Fundingsland, Monica Louise Curry 40

G

Gacitua-Mario, Estanislao 27
 Gagnon, Benoit 31
 Gaviño Novillo, J. Marcelo 69
 Gazzola, Paola 14, 32
 Genel, Sema 32
 George, Clive 33
 Georgewill, O.T.C. 6
 Giannella, G. 13

Gianoni, Pippo	14, 32
Gillmore, Thomas	72
Goldsmith, Bernice	33
Gosselin, Pierre	44
Grassetti, Richard A.	34
Green, Jeff	65
Groen, Wim	34
Gullón, Natalia	35
Guta, V.	57
Guzmán, Elmer Cardozo	35

H

Hasan, Salman	36
Hassan, A.A.	37
Henderson, Katina	17
Hooper, Michael	44
Hurni, Andreas	9

I

Ingram, Verina Jane	37
---------------------------	----

J

Jiliberto, Rodrigo	38
Johnson, Nancy	59
Jonathan, Goodluck	11

K

Karácsonyi, Zoltán	39
Kent, Michael	34
Kessler, Jan Joost	78
Khan, Basit	36
Kilian, Darryll	19
Kim, Ji-Young	39
King, Nicholas	40
Kinn, Sigurd Juel	40
Kirkpatrick, Colin	45
Koenig, A.	41
Kolhoff, Arend	41, 73
Komonibo, I.T.	55, 56
Kotschoubey, Nicolas P.	6
Kowalczyk, Ryszard	42, 43
Kruger, Lynette	19
Kwiatkowski, Roy E.	44

L

Lane, Sue	19
Lauria, Mary Lou	44
Lee, Norman	45
Leistriz, F. Larry	45
Leitch, Jay A.	46
Leknes, Einar	47
Leon, Jorge A.	47
Lopez, Andrea	81
Lubis, Rusdian	66

M

Machá..ek, Jaroslav	48
Madiba, Tiny	66
Marshall, Ross	48, 49
Martis, Miroslav	49, 50, 86
Mathur, Vinod B.	50
Mato-Dustin, Maria	51
Max, Lisa	17
McKeehan, Tim	58
Mercier, Jean-Roger	64
Morel, Stefan A.A.	71
Morgan, Richard K.	51, 52
Morgan, Tracey	52
Morrison-Saunders, Angus	52, 53
Myungjin, Kim	53, 70

N

Nafti, Rachid	33
Nelson, Belief	55, 56
Nestler, John M.	22
Neto, Ascendino d'Avila Melo	67
Nilsson, Måns	54
Nitz, Tracey	19
Noble, Bram	76
Northey, Rodney	55

O

Ofongo, A.E.	55, 56
Oleson, Kirsten	56
Opoku, Irene Francisca	5
Oprea, I.	57
Oprea, M.	57
Ortolano, Leonard	57
Owens, Charles, E.	82
Oxendine, Linda B.	58

P

Pachico, Douglas	58, 59, 62
Partidário, Maria Rosário	59, 60
Penris, Mamon	80
Peymen J.	29
Pillu, Geert	78
Pisanty-Levy, Julieta	61
Platzer, Ursula	61
Posada, Ricardo Delgado	62
Post, Reinoud A.M.	71

Q

Quinones, Juan David	62
Quintero, Juan David	56, 62

R

Raimondo, John 19
 Rajvanshi, Asha 63
 Ramasar, Vasna 64
 Rivera, Carmen Mardones 64
 Robijn, Frank 65
 Robison, Neil D. 22
 Roscam Abbing, Ernst W. 80
 Ross, William 65
 Ross, William A. 25
 Rossouw, Nigel 11, 66
 Rougerie, Jean-François 31
 Rukuba-Ngaiza 66
 Rukuba-Ngaiza, Nightingale 66, 67

S

Saavedra, Carlos Gonzalo 67
 Sabatini, Francisco 16
 Sackey, Ben A. 68
 Saltik, Ahmet 32
 Sánchez, Jairo Homez 68
 Sangwook, Han 70
 Sarandón, Ramiro 69, 72
 Scholten, Jules J. 71
 Scrase, Ivan 71
 Sell, Randall 45
 Sepúlveda, Claudia 16
 Sewduth, Dhaya 72
 Sheate, William 71
 Shepherd, Desiree 84
 Shoobridge, Diego 70
 Shrimpton, Mark 75
 Shultz, Steven 46
 Shuttleworth, Jaye 72
 Singh, Larry 72
 Slootweg, Roel 73
 Smith, Nick 49
 Smolders, Kathleen 79
 Snow, Hendrik 73
 St-Louis, Robert 74
 Steinhauer, I.A. 74
 Stevanin, Marco 14, 32
 Stewart, Gerard William 75
 Storey, Keith 75, 76

T

Treweek, Joanna R. 73, 76, 85

U

Ukkerman, Rob 78

V

Valadas, Bertilia 77
 van den Berg, Job 77
 Van Dyck, Marc 78
 van Gent, Petrie 78
 Van Gulck, T. 29
 van Straaten D. 29
 van Straaten, Dick 79
 Vanclay, Frank 80
 Varela Put, Gerard 80
 Vemuri, Siva Ram 81
 Verheyen, Rudof 79
 Vincelette, Manon 30
 Viña-Vizcaino, Gerardo 81
 Vladerrama, Hernando 58

W

Weaver, Alex 11, 66
 White, Douglas 59
 Will, Jeffry A. 82
 Williams, Terry 82
 Wilson, Lee 83
 Wiseman, Keith 84
 Wolf, C.P. 6
 Wright, Ray 48

Y

Yuen, Wang C. 84

Z

Zanewich, Debra 76, 84
 Zannin, Daniele 14
 Zarzar, Alonso 85
 Zdrzil, Vladimir 86, 87
 Zuin, Cristina 14



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