

Abstracts Volume

# Growth, Conservation and Responsibility

Promoting Good Governance and  
Corporate Stewardship through Impact Assessment

---

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## Notes

This document contains the abstracts for papers and posters presented at IAIA07, "Growth, Conservation and Responsibility: Promoting Good Governance and Corporate Stewardship through Impact Assessment," the 27<sup>th</sup> annual conference of the International Association for Impact Assessment.

Abstracts and updates received by IAIA online per submission and updating guidelines and with the presenting author registered in full on or before 15 March 2007 are included.

Abstracts, as available, are arranged in alphabetical order by the presenting (first) author. Abstracts have been formatted for style consistency and minimally edited; otherwise, text and contact information are generally reproduced as submitted by the author(s).

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## IAIA07 Paper and Poster Abstracts

286. (Paper)

### **Environmental Impact Assessment in the Booming Floriculture Industry of Ethiopia**

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Despite the huge potentials for floriculture Industry in Ethiopia, the sector has been neglected until recently. Flower farming was effectively operating in not more than 20 ha of land until 2003. The last three years have seen significant developments in flower farming, and at present the area coverage is estimated at more than 2000 ha of land.

While the flower industry is beneficial to the country in terms of employment creation, foreign exchange earning and multiplier effect on the local economy, it induces undesirable impacts on the environment. The undesirable impacts of the Industry largely emerge from the wide ranges of pesticide use.

Despite the significant roles of EIA in avoiding and mitigating environmental impacts of pesticides, it has been reported that EIA studies within the floriculture Industry in Ethiopia are weak in addressing environmental and social issues.

I strongly believe that environmental damages and health havoc reported elsewhere in the world because of pesticide use can be avoided if the corporates involved in the floriculture industries of Ethiopia are responsible. The paper will discuss environmental impacts of the floriculture industry in Ethiopia and recommends ways to improve EIA practices in the sector before it becomes too late.

236. (Paper)

### **How Impact Assessment Is Needed in Sustainable Development in Nepal? (Mixed View)**

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Environmental data is still a new and incomplete area in Nepal. It can be difficult both to discover what data are available and to obtain access to them. Relevant data are scattered among many institutions, and are often unpublished. There are many gaps and inconsistencies, problems in data quality, lack of clear information about methods and definitions used lack of time series, and lack of comparability between different data sets.

These issues need to be brought up in the appropriate sections in this any development areas. Nevertheless, the information published by us provides a basis for assessing the state of the environment in Nepal, as well as factors like environmental governance, financing, and trade that influence it. The extensive sources listed will provide future researchers with a basis

280. (Paper)

### **Humbo and Sodd Community-Managed Natural Regeneration Project: Social Assessment (Recipient of the IAIA President's Bursary 2007)**

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This case study is the first of its kind in Ethiopia. Thus, it can be replicated in many parts of Ethiopia in future.

The social impact assessment on the Humbo and the Sodo Zuria Wereda Administration of the SNNP is part of the "Humbo and Sodd Community-Managed Natural Regeneration Project." The assessment focuses on a number of Kebeles that have communal land in the areas proposed for regeneration. The assessment report was supposed to provide information on households that may be affected as the result of the envisaged Carbon Project.

The result of the assessment showed that the number of community members to be displaced due to the implementation of the project would be insignificant, and it is in line with the World Bank's Safe guard policy. Based on the assessment finding, it was recommended to implement the project in the study area.

The aim of my paper is to present the result obtained during the SIA study at Humbo Sodo community.

The expected outcome of the paper to be presented in IAIA07 is to share experience and learn from the international experts on SIA.

330. (Paper)

### **Environmental Impact Assessment in an Oil and Gas Company-Petroleum Development Oman Experience**

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Petroleum Development Oman (PDO) is considered as the largest oil exploration and producing company in Oman. PDO's concession area occupies about 60% of the total Sultanate area. PDO executes a range of developments of various magnitude and variety, from oil and gas development projects to construction of sewage treatment plants and communication towers.

PDO's statement of general business principles has made it mandatory to conduct Environmental Impact Assessment (EIA) prior to all new activities and facility developments, or significant modifications of existing projects. In addition PDO undertakes Integrated Impact Assessment (IIA) through which Environmental, Social and Health impact are considered in a holistic manner.

The impact assessment process follows a sequence of several steps which starts at the early stage of project definition into design process to minimise impacts and maximise benefits. The process is linked throughout the project life cycle, from feasibility through design to decommissioning, with a clear deliverable at each phase of the Value Assurance Review (VAR) process. This paper discusses impact assessment process in PDO and its application to business.

220. (Paper)

**Conservation Warriors: The Role of the Military in Transboundary Environmental Protection**

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Border areas are often under military jurisdiction and the impact on the environment in such zones is thus often considered a security issue, hence reducing public knowledge and access. While military operations can clearly have a negative impact on the environment due to ammunition usage and testing, there can potentially also be some positive spillovers of military operations. Border areas may become default conservation zones because large infrastructure development is prohibited for security reasons. However, despite such positive spillovers, the military presence is emblematic of tacit or overt conflict between neighboring states. This paper will examine how the role of the military in such contexts can be transformed to have both conservation benefits through monitoring and enforcement of environmental violations and also promote peace. Interviews with key military personnel in the United States, Europe and Asia will be analyzed in this context. Recommendations will be provided to governments and military planners on training border forces in conservation issues. Many of the outdoor survival skills which military personnel are so familiar with could play a vital role in this regard. Partnerships between local border communities and the military will also be explored.

263. (Paper)

**Gender Issues in the Participatory Approach to Resource Management for Water Supply and Sanitation in Ghana**

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Environmental Assessment (EA) studies are employed in Ghana as a resource management tool providing a formal process for the Ghana Environmental Protection Agency (EPA) to assess the environmental and social implications of projects in line with the EPA Act 1994, Act 490 and Environmental Assessment Regulations 1999, LI 1652. The Government of Ghana continues to invest heavily in the water supply and sanitation sector under the Ghana Poverty Reduction Strategy (GPRS) and also in fulfillment of the Millennium Development Goals (MDGs) which expects water supply coverage to increase by the year 2015 from 36% to 68% for rural and 85% to 93% for urban areas, and sanitation from 37% to 69% for rural and 54% to 77% for urban areas. These aspirations are continuously scrutinized within the framework of a national Integrated Water Resources Management (IWRM) Plan and also the Strategic Environment Assessment of the Sector. The participatory approach has been recognized to play a vital part to implement the development programmes, and the paper examines the critical role of women and children in both the IWRM study and SEA exercise to achieve the MDGs for the sector.

619. (Poster)

**Reclaiming Conservation in Developing Countries through Sustainable Waste Management**

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Conservation efforts continually make headlines as man tries to save several species from extinction. Tourism, which to a large extent depends on the success of these efforts, has over the past few

decades been a major source of income for countries in transition.

Along with substantial economic growth, tourism has brought environmental degradation in these countries as a result of related infrastructure such as hotels and transport systems like airports. Improper waste disposal in tourism facilities is a major problem that without proper handling could spiral out of control and destroy conservation efforts. Lack of waste-related legislation and poor implementation has turned tourism into an environmental opponent in several developing countries.

Managing waste in tourism infrastructure is essential in mitigating threats to the natural environment, but it can also provide a strong understanding of how certain waste material can be profitable. Through a comprehensive assessment of issues arising as a result of non-compliance, potential risks are identified from common practices. These can provide an early identification system of any increasing risk, enabling preventative or corrective measures to be put in place to protect the surrounding environment and ultimately help in using resources efficiently and maintaining conservation efforts.

701. (Paper)

**Impact of Mining on Community Water - Tarkwa Mine in Ghana**

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Mining often occurs in or near sensitive natural environments and most often, the impact on community water and fauna is undesirable. Damage or clearing of native vegetation most often leads not only to direct losses but also fragmentation of habitat such as rainfall runoff from disturbed land leading to soil erosion, turbidity, siltation or pollution of local streams. Solutions from processing can also be a major pollutant on both surface and ground water. This research assesses the quality of surface water discharge into the communities as well community water provided by Gold Fields Ghana Limited, as part of its industry approach to water management.

Data from a three-year (2004-2006) water monitoring programme from an external analytical laboratory was used. The study revealed that the physical parameters are within the WHO guidelines as well as the Ghanaian Environmental Protection Agency. However, elevated pH values ranging between 4.7 and 11.3 were recorded in the community wells while very high TSS (Total Suspended Solids) values were recorded. It was found out that samples with high values were taken immediately after concrete work was undertaken and the impact of the cement used is a factor for this.

271. (Paper)

**Environmental Mainstreaming in Bhutan**

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As is the case with many developing countries in the region, Bhutan has a strong environmental regulatory framework, and an active environmental impact assessment system. Unlike many of its neighbours, however, Bhutan also has a very strong legal basis for strategic environmental assessment. This provides an excellent opportunity for the country to extend beyond project assessment, to build environmental concerns into the strategic planning activities of line Ministries and regional governments.

This paper outlines some recent progress made in explaining the techniques associated with environmental mainstreaming, especially in relation to the five-year National Development Planning process. It also aims to provide ideas and guidance for other developing countries that are in a similar situation.

383. (Paper)

**Lessons from the São Paulo-Brazil Ringroad Strategic Environmental Assessment**

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At the outset of the 21st century, Strategic Environmental Assessment is one way to include the environmental value early in the planning cycle. At São Paulo Metropolitan Area, an experience with SEA applied to a very large scale infrastructure initiative was developed. This region is building a new ringroad with 173 km length, named The Rodoanel Mario Covas. Started off as a major project initiative, yet characterized as a multi governments program, the SEA was a consequence of great public opposition to the project and the need to consider and argue for its strategic reasons. This example allows some important lessons to be learned on how SEA was enabled with a strategic

focus, albeit in the midst of a major project context, and how strategic insight can be conciliated with project assessment. Among other issues, it is important to emphasize the long time frame of the strategic discussions supporting the initiative, the high level of central coordination on the SEA effort; the importance of being highly selective in early questions considered; the establishment of strategic flexibility in the decision-making process; and the opportunity that a structuring program brings to study, in detail, the sustainability prospects of a major region.

529. (Paper)

#### **Can Early Market Involvement Strengthen EIA?**

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This paper provides the introduction to the workshop "Strengthening EIA through Early Market Involvement."

Traditional methods of procuring and delivering national and municipal infrastructure have often resulted in problems of cost overruns and project delay. As a result, these methods have changed in recent years, moving towards the integration of project design and assessment, construction, operation and maintenance. Examples include Design and Build, and Build Operate and Transfer. Market parties (e.g. , contractors, financiers) are involved more and earlier in project planning and impact assessment, and government parties are more removed from project implementation. These project procurement have a direct impact on the practice of EIA.

This paper provides an introduction to the workshop devoted to EIA and early market involvement. It describes traditional procurement practices, identifies recent changes to procurement methods, and considers how these affect the EIA process. Key issues, based on lessons learned to date, are identified and described. These include the roles and responsibilities of the different parties, the level of project design detail available, identification and implementation of mitigation measures, transfer of environmental information between different stages of the process, changes to contractual requirements and contract monitoring, and ensuring the integration of environmental issues in infrastructure

design. Examples are taken from experience in the Netherlands, the UK and Scandinavia.

727. (Paper)

#### **Economic Development vs. Conservation - The Okoroba FDP Experience**

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The gains of biodiversity conservation can never be overemphasised, taking into consideration the various conservation initiatives taking place all around the world and the value that they add to human existence. However, it goes without saying to point out that these conservation initiatives sometimes clash with the genuine economic needs of people – especially those originally inhabiting a delineated conservation area. The need therefore arises for some biodiversity offsets to be effected in order to balance both the needs for human sustenance within a given conservation area while also achieving the aims of biodiversity conservation.

A typical case is that which occurred during the Okoroba FDP EIA process (in Shell Nigeria) of which the inhabiting communities demanded that tarred roads be constructed to link their villages as a prerequisite for a licence to operate; incidentally these roads would have to traverse the Edumanon forest that was gazetted as a conservation area by the Nigerian government. This, however, goes against the Shell group policy; and so government regulatory bodies were called upon to broker an agreement that would provide economic gains for the community while ensuring the sustenance of the proposed conservation area. Decisions that were reached are discussed.

683. (Paper)

#### **Impact Assessment of Urban Wetlands in the Western Province of Sri Lanka**

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Urban settlements have preliminary begun in the areas of water available. Even in ancient Sri Lanka, most of the urban centres were begun at the edges of water bodies. In the capital city of Sri Lanka, the wetlands are very much sensitive ecosystems and in the low-lying city areas they are very important flood retention and detention areas, which give more comparative advantage than protection for biodiversity. However, the biodiversity in many



wetlands is very high and is yet another significant reason to conserve them.

The region's wetland network is the macro scale natural drainage network affording vital storm water drainage and flood detention, thus protecting high land from flooding and making it available for intensive urban development at little or no cost. Most wetlands also serve as green lungs and as essential open spaces for human health (both physical and mental) comfort and recreation.

Lack of urban highlands for urban development in the western province creates pressures on urban wetlands and sometimes loosens regulations.

360. (Paper)

#### **Changed Environment - Impact on Livelihoods**

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In its role as a support function to Sida (Swedish International Development Cooperation Agency), the Swedish EIA Centre commissioned a study on linkages between livelihoods and natural resources in Niassa Province, Mozambique. The purpose was to complement the available baseline data on the area, in light of a planned investment in large scale tree plantations. An EIA was carried out in the same time period, covering impact on biophysical parameters. The livelihood study aimed to complement and add a poverty dimension to the impact assessment.

The majority of the rural population in Niassa is totally dependent on natural resources and a conversion of land to large forest plantations, without a concomitant change of agriculture methods, may lead to land conflicts. An extensive land delimitation process was undertaken, yet not one person among the several hundred interviewed during the livelihood study could identify an area intended for plantation.

Change in livelihood patterns causing social disturbances must be taken into account in project planning and corresponding mitigation measures implemented. We welcome a discussion on what is pro-poor development and which type of assessment is most appropriate to capture the interests of local poor and weigh them against macroeconomic priorities.

357. (Poster)

#### **Influence of Island City (Artificial Island) on the Water of Head of Hakata Bay, Fukuoka Japan**

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The head of Hakata Bay has been reclaimed since 1994. The planned reclaimed area is located adjacent to a shallow sea area, so we decided to construct an island instead of a reclaimed area connected to the main land for environment friendly reclamation. After beginning the island reclamation, the change of environmental condition such as water quality around the site has been continuously monitored to prevent reclamation damage.

Since the water pollution at an enclosed area behind the reclaimed island was concerned, we conducted the numerical simulation in EIA (Environmental Impact Assessment) prior to the reclamation. As a result, we took measures such as displacement of discharging point and reduction of phosphorus from sewage by MAP (Magnesium Ammonium Phosphate) method.

As the effect of the measures, the long-term monitoring survey showed the improvement of transparency and the reduction of phosphorus in the area behind the island. As hypoxic water masses are still seen in summer, we have to discuss the way to reduce nitrogen originating from the sewage as one of the extra measures.

722. (Poster)

#### **Socioeconomic Effects on PM10 Related Mortality in Seoul, Korea**

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We examined the effects of PM10 exposure on daily mortality by socioeconomic status in Seoul from 2000 to 2004. Socioeconomic status was defined based upon the type of health insurance program. Korean health security system consists of two types of health insurance: National Health Insurance program for common household and Medical Aid program for lowest-income households (approximately 3.3% of Seoul citizens).

Evaluated over 10 ug/m3 increase in PM10, we found the relative risk of premature mortality to be 1.003 for the all-age population. In 65 years and over population, the relative risk for the medical aid group was 1.007, while that for the health insurance group was 1.004. For the 65 years below, the RR for the medical aid group was greater (RR=1.018, 95% CI 1.006~1.031) comparing to the health insurance group (RR=1.002, 95% CI 0.998~1.006).

Our analysis suggested that the effects of PM10 exposure on health are differentially distributed by socioeconomic status, i.e., between the medical aid group and the health insurance group. In this study, the 65 years below with medical aid was the most susceptible to PM10 exposure.

473. (Paper)

**Evaluation of Effect of TMDL on Local Government**

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The Korean total maximum daily load Act (KTMDL) enacted as a watershed-based water quality management tool in 2002. The Ministry of Environment (MOE) set a water quality target at boundary of metro-self-governing bodies (MSGB) and the MSGB allocate pollution load (BOD5, kg/day) to local self-governing bodies (LSGB) to meet the water quality target. The LSGB devise and manage the development plan within pollution load allocated. But it is impossible to do that if there is no load allocated or drained LSGB of load allocated. The dissatisfaction on TMDL is increasing more and more, especially where LSGB has low economic independence even though the effect of TMDL had not yet clearly recognized. This fact makes it more difficult to settling TMDL in Korea successfully. This study was performed to address the economic and environmental effect of TMDL on local government. The study area was limited to a specific area because the economical and environmental value of pollution load is depends on properties of LSGB.

787. (Paper)

**Stakeholders and Evaluative Integration: Opportunities and Incentives to Integrate Knowledge - Some Converging Threads**

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In some jurisdictions, the nature of resource management and policy decision making is changing from traditional government-oriented modes towards a model of network governance in which non-government stakeholder groups play a more prominent role. Sustainability assessment requires the integration of different forms of knowledge for the purposes of informing policy or project decision makers, and stakeholders are important contributors to this integration. This paper draws together some converging threads and discusses implications for the practice of impact assessment.

741. (Paper)

**Bridging the Gap Between EIA and Procurement**

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In Sweden, the procurement of infrastructure projects has been undergoing some fundamental changes in recent years, moving towards the integration of project design, construction, operation and maintenance. This development involves a number of changes for the practice of EIA. The Swedish transport authorities and the Swedish Environmental Code raise demands on the way EIA shall be performed, on the content of the EIS and measures regarding the mitigation of significant environmental impacts. However, due to a lack of adequate mechanisms, environmental requirements included in the EISs are often not considered in the construction phase. This implies that important information is not passed on to the construction phase which means that environmental measures that were considered during the selection of alternatives are not implemented. Green procurement could provide a link between the planning process and construction phase in which the proposed measures of the EIS are transferred into clear environmental requirements. In order to investigate the possibilities to improve the link between the planning and the construction phase of road projects a research study has been initiated. This paper discusses factors for improved information transfer between the planning and the construction phase, which contributes to the environmental effectiveness of road development.

422. (Paper)

**Environmental Impacts in Solid Waste Management Systems: An Impressive Case Study**

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The paper discusses the environmental impacts related to an incomplete and debatable integrated municipal solid waste management system, with regard to the case study of Campania Region in Southern Italy.

The integrated solid waste management system planned in Campania is characterized by a separated collection of 35% of the total solid waste production and the treatment of the restwaste in MBT plants to obtain Refuse Derived Fuel (RDF) and Stabilized Organic Fraction (SOF). Currently seven RDF/Biostabilization plants have been working since 2000, while the two expected thermal treatment plants are under construction yet due to social conflicts in siting.

The produced baled RDF are stocked in several regional sites: this temporary solution is very dangerous due to the risk of contamination and accidental burning. Particularly, the implementation of an incomplete management system due to the absence of thermal treatments plants has implied the following critical situation:

- 75,000 tons of RDF bales produced per month
- 50,000 m<sup>2</sup> per month used for bales storing
- 3.5 millions of RDF bales produced until to 2006 year
- 50 years for burning all the bales, if the in-construction thermal treatment plants begin to work immediately

321. (Paper)

**Strategic Guidelines for the Integrated Development Oo Valdaso (Aso Valley) (Ascoli Piceno) – Marche - Italia**

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Main project actions:

- Definition of Valdaso "Territorial Trademark" through the definition of a participative strategic plan for the environmental management
- Definition of proposals for the environmental restoration of the river Aso to connect the different Municipalities of the Aso area.
- Development of the guidelines for the organization of the "Rural District of Valdaso", through the touristic improvement of the area with attention to the historical towns and villages.

The Valdaso territory represents a strategic opportunity for the enhancement of economic and environmental sectors of the Ascoli Piceno Province.

The Valdaso area represents a "corridor" between the "Monti Sibillini" National Park and the future "Piceno" Sea-Park. Its geographical features represent an opportunity to let a sustainable development.

These qualities are the source for giving a new boost to the local economic structure, which is currently based on unconnected local policies.

This project has been developed within this context and its purposes are the definition of guidelines for the integrated and sustainable development of Valdaso and the establishment of the basics for the institution of a "Territorial Trademark" (Marchio d'Area) which should represent the area. This instrument will enable a large scale environmental planning and an integrated management of the landscape. This integrated system will be founded on two core principles: the enhancement of biodiversity and the improvement and promotion of landscape, agricultural and touristic values.

The Valdaso project approach is strictly joined to environmental planning and strategic environmental assessment. That means every landscape element and feature is analyzed and assessed to understand correlation among factors and to apply sustainability principles to future local plans and projects.

380. (Paper)

**Remote Sensing and Photointerpretation as Essential Tools for the Monitoring of Illegal Waste-Disposal Practices**

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New developments in remote sensing are taking place, particularly in the field of radar remote sensing and the acquisition of optical data at higher spectral and spatial resolutions and they could be applied in environmental monitoring. These techniques provide the capability for mapping and monitoring land cover and land use change. Data and information obtained through Earth Observation (EO) can be used within Geographic Information Systems for overlay and comparison with other geo-referenced information.

In this paper, a case study about the investigation on an illegal land use is presented. The site in study is located in the Campania Region, Southern Italy. By remote sensing it has been possible to identify different temporal transformations of the territory, due to an unprofessional management and disposal of solid waste, the origin and composition of which are unknown. The interpretation of remotely sensed images has been verified by ground truth studies. The term most frequently used to define this practise is *eco-mafia* or *waste mafia*.

Remote sensing and photointerpretation are needed to develop an effective monitoring program to prevent infiltration by "ecomafia" organisations, which find fertile ground in this sector and cause enormous damage to the environment through illegal waste-disposal practices.

248. (Paper)

**SEA: The Missing Link Between Directive and Practice**

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The strategic environmental assessment has been proposed and introduced as a standard procedure in the planning process to remedy the well known ineffectiveness of EIA in its role of controlling the environmental compatibility at the project scale. In its general outline, SEA has been designed as a good way to integrate, on environmental basis, the different territorial management strategies, such as waste, energy and transport plans. The Cumulative Impact Assessment is an essential tool of this new approach. The spatial and temporal windows adopted in the environmental assessment of a project are too limited for this methodology. The typical spatial and temporal scales of the planning process, however, are adequate to carry out a cumulative impact assessment that could become a reliable tool for prediction, comparative selection between alternatives, and a final choice consistent with the environmental goals. Anyway, SEA seems

to come to the same dead end in which EIA is trapped, a route that surely does not lead to efficient territorial management, but to a further bureaucratic load without positive results.

This comment is justified by Italian experience, with further verifications at European level, as well as by a large amount written on the subject at international level.

241. (Paper)

**A Fault Analysis for Health Impact Assessment: Procurement, Competence, Expectations, and Jurisdictions**

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I analyse failures in the health impact assessment process of five different major international projects owned by various multinational consortia. My objective is to improve the process. I examine how the consortia approach the issue of procurement of consultancy services, and the competence with which consultancy companies offering such services respond. I look at issues of jurisdiction over management and content and the ethics and expectations of baseline studies. Finally, I offer solutions to some of the challenges described.

451. (Paper)

**Transformation of German Transport Governance? Contribution of Strategic Environmental Assessment to Change in Transport Policy**

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The EU encourages environmental integration into sector policies. In Germany the political system does not leave much room for this. A way to realize the integrative approach in the transport sector is the application of a Strategic Environmental Assessment (SEA). Due to the European SEA directive, assessments provide information in planning processes but there is little evidence on how this leads to changes in decision-making. As every decision-making process is unique, there is no common indicator for "Integration into decision-making." Hence, the paper suggests using the sociological concept of institutional change (of procedures or methodologies) as an indicator for integration to find out if SEA has an influence on decision-making in the transport sector or not.

This argument is elaborated in a case study of the German, nation-wide transport infrastructure program Federal Transport Infrastructure Plan. The case illustrates how beyond methodologies planning procedures have to be adjusted in order to match the requirements of the new SEA law. It concludes,

how an integrative approach could look like. The paper presents selected results of a Ph.D. Thesis currently conducted at the University of Osnabrück and the Wuppertal Institute.

556. (Paper)

**Socio-Economic Impacts of Large-Scale Natural Resource Projects in Canada: Lessons Since the 1990s**

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The ultimate goal of this project was to find evidences of socio-economic and cultural impacts by large-scale projects in order to support policy decision-making. Natural resource projects included mainly mining, hydroelectric and oil. Large-scale projects were defined as projects of significant financial engagement, with major impacts on host communities.

The authors tried to identify economic and social impacts through follow-up studies, but research revealed that these kinds of studies are not yet regularly conducted in the Canadian context. Instead, other sources such as academic studies, project case-studies and other presented in the EIS process were of particular interest and useful.

Main findings showed a fragile balance between positive impacts such as higher employment for local communities, infrastructure, incomes and revenues for individuals and governments and negative impacts such as loss of land and traditional way of life, increase in social and health problems, overloading of services, lack of affordable housing, decrease of quality of life.

Aboriginal people were particularly impacted, as it appeared that most of the large-scale natural resource projects were usually in remote areas. The authors also provide a series of recommendations to improve decision-making on future projects.

203. (Paper)

**Health Impact Assessment: An Underserved Miami, Florida, Community Embraces the Future and Preserves the Past**

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Overtown was a thriving center for Greater Miami's African-American community. Tragically, the construction of a highway through the heart of Overtown and subsequent public policies have negatively impacted the health, economy and culture of the community. Recent success in opposing yet another proposed road construction project illuminated the need for a consistent protocol for assessing and detailing the potential health impact of these projects. Residents, however, were conflicted in their perceptions of economic development. Community residents were interviewed to determine their perceived threat, knowledge of HIA and efficacy related to opposing potentially detrimental community proposals. Data will be used to develop a module to (1) train residents on the principles of HIA, (2) assist community stakeholders in negotiating with municipal, private and public sector development professionals and (3) encourage responsible development by creating designated "healthy living" zones. Overtown residents want their community to develop and resemble its proud past, but not if it will negatively impact their health or force them to relocate.

447. (Paper)

**Consideration of the Impacts of Noise in Health Impact Assessment and the Canadian Environmental Assessment Act**

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Noise-induced hearing loss is well-documented at high sound level exposures. However, sound levels below those causing impairment may also be capable of causing health effects, including annoyance, sleep disturbance and interference with communication.

In Canada, various approaches are used to assess community noise impacts, which can make them difficult to compare. Noise is for the most part

regulated by provincial and territorial governments and the criteria for managing community noise typically emphasize noise complaints as an end point. Health Canada has adopted the approach recommended by the International Standard for Organization to measure and assess environmental noise. This approach is founded on a large body of socio-acoustic research and can be used to predict the percentage of a community that would be highly annoyed by a change in noise levels. Health Canada recommends that the magnitude of the increase in the estimated percentage highly annoyed be among the criteria used to evaluate project-related noise impacts.

This recommendation has been accepted by some jurisdictions, but has been contentious in others. We are working towards developing a consistent approach that would identify and minimize noise impacts on human health due to project-related changes in community noise levels.

506. (Paper)

**Impact Assessment, Environmental Conservation and the Sustainable Development of Petroleum Resources in the Endangered Nigerian Delta Region**

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Petroleum resources development started in the Niger Delta in 1956, before the commencement of EIA in Nigeria.

When EIA commenced in 1992, the adverse effects of the informal development of the resources in the Delta region had begun to cause concerns among citizens and other concerned public. Beginning with the Ogoni Bill of Rights, 1990, citizens and citizens' groups in the region started making pronouncements regarding the adverse effects of petroleum development. On its part, the Rivers Chiefs and Peoples Conference (RCPC), made a presentation at the Earth Summit in 1992, which explained the adverse effects of petroleum development in the region. In the process, the RCPC pronounced that Niger Delta is endangered, and that it is perhaps the most endangered Delta region in the world.

As a significant sustainable development tool, IA has a significant role to play in petroleum development in the Delta region. Besides, along with the role of other stakeholders, good governance (especially good environmental governance), aided by improved CSR, deserve to facilitate sustainable development in the region via environmental conservation and rehabilitation, in the interest of natural resources and humanity thereof, and industrial peace and security in the petroleum sector of the Nigerian political economy.

776. (Paper)

**Tailor-Made Strategic Environmental Assessment of Trade Agreements**

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Trade agreements and policies have a large impact on the environment. Therefore it is worthwhile to undertake a strategic environmental assessment (SEA) parallel to the planning and negotiation processes for trade agreements. The IUCN and the CCAD (Comisión Centroamericana de Ambiente y Desarrollo) have proposed an SEA for the trade negotiations (2007-2008) between the European Union and Central America. The Netherlands Commission for Environmental Assessment (NCEA) has been asked to support this SEA. Therefore, we try to combine available guidelines on SEA and trade into a proposal for a tailor made SEA of trade agreements. During the IATRP stream we would like to share ideas about this proposal. The proposal should concern methodology, content, and process. One of the methodological challenges would be to match the SEA with national and international environmental assessment procedures such as sustainability impact assessment (SIA). About the content of the SEA, setting priorities and identifying effective indicators would be a key issue. Finally dealing with transparency and confidentiality could be one of the major process challenges.

279. (Poster)

**The Benefits of Social Impact Assessment for the Environmental Impact Assessment Process**

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This poster illustrates the use of social impact assessment at the community and project level to help impact assessment practitioners, community and regional 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 its use in the planning process, the basic Social Assessment Model is laid out. Next the SIA scoping process is outlined as the way to identify likely social impacts (issues) and major stakeholders.

The content of the social assessment (analysis) is made up of 28 social impact assessment variables which I use to explain change in a variety of project, policy and programme settings.

The poster concludes with an outline of how mitigation and monitoring have been used to enhance the benefits of project development and change that will come to the recipient community or region.

664. (Paper)

**IFC Performance Standards in Practice: A Methodology for Integrating Social and Environmental Effects for the Assessment of a Mining Project in Argentina**

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The new IFC Performance Standards for Social and Environmental Sustainability require methodologies to assess social and environmental implications of development in an integrated fashion. Rescan Environmental Services Ltd. prepared one of the first assessments applying these standards to assess a mining project in NW Argentina. Initially, the potential effects of the project were identified by considering the results of a community consultation program and a risk assessment, identifying how the industrial processes involved in the project may alter current social and biophysical conditions. These effects were then categorized into ten principal issues, which provided a structure to organize the assessment. For example, the principal issue of 'alteration of surface water quantity' included effects on aquatic life (environmental) and human users of water (social). The next step was the formal assessment of each effect, or series of effects, related to each principal issue. Inter-disciplinary teams provided descriptions and models of change to the environment, followed by an attempt at holistic assessment. Predicted social and environmental consequences of the project were assessed twice, with and without mitigation. This double assessment highlighted the social and environmental policy of the proponent by explicitly linking predicted effects to commitments for mitigation and enhancement actions.

308. (Paper)

**Environmental Stewardship, EIAs and the Private Sector in Guyana: An Uneasy Alliance?**

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Globally, the role of the private sector has changed dramatically in response to increasing international

pressure resulting from globalization and the growing awareness of environmental problems and their consequences.

In Guyana, the Environmental Protection Act which was passed in 1996, seeks to assure the effective management and sustainable use of natural resources, and the protection of the environment. Specifically, Part IV of this Act mandates the conduct of environmental impact assessments. Over the past ten years, there has been a constant battle between the Environmental Protection Agency and the private sector who think the EIA, more often than not, is an impediment to economic growth.

This paper examines responses of the private sector to the environmental legislation in Guyana. It will also discuss the concerns raised by the private sector on matters pertaining to the EIA system in Guyana, including the high costs incurred, the extraordinarily long time the process takes, institutional bureaucracy and duplication of functions, and the lack of incentives. The paper will conclude with a discussion of the major institutional challenges (for example, legislative overlaps in institutional jurisdictions and poor administration of MoUs between sector agencies, and institutional capacity) and possible solutions.

478. (Poster)

**A Study on Establishment of the Directions for Environmentally-Friendly Restoration of Stream by Citizen**

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The purpose of this study is to establish future directions of environmentally-friendly restoration of Suwon stream and reflect various opinions of inhabitant in the plan and design process. The opinions from the citizens include the economic and environmental suitability of the restoration projects and preference for the future directions of restoration. The citizens are favorable to removing the existing parking lot and want to have jogging course, walking path and bike road in the stream depending on the restoration influencing zone. This study was comprised of 800 citizen participants.

In many parts, citizens agree in restoration but they have different opinions about the feasibility of new facilities, streams restoration and central park reduction locally. It is desirable to reflect the opinions of citizens in the process of plan and design of restoration project.

485. (Poster)

**A Study on the Making of Suwon Hwaseong, a World Heritage, into a Holy Place**

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The purpose of this study is to enable Suwon Hwaseong, a World Heritage, to serve as a world-renowned tourist and cultural resource by restoring the part of Suwon Hwaseong, and making it into a new tourist and cultural property, while laying the foundation for and establishing the goal of proudly handing down Suwon Hwaseong to future generations by presenting the strategy and plan for reviving the old downtown area of Suwon and managing its surrounding areas. Its value was recognized on December 4, 1997, when it was registered as a UNESCO World Heritage. Accordingly, interests in Suwon Hwaseong increased sharply both at home and abroad, and the number of visitors increased rapidly. As a result, its historical and cultural value was now in the limelight again. In addition, the development of a new downtown and the expansion of the residential area modified the spatial structure of Suwon, and the development of a new downtown led to the deterioration of the old downtown. It is necessary to take aggressive approaches to keep cultural values intact, and to reorganize cultural properties by dint of the recent Hallyu culture and the success of historical dramas, and to consolidate the position of Suwon as a city endowed with a World Heritage by fostering the environment for doing justice to the historical and cultural image of Suwon in new urban development projects.

273. (Paper)

**Sustainability Appraisal and Flood Risk Management in England**

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Flooding causes significant negative impacts in many countries. In England, the average annual damage caused by flooding is close to \$4 billion, making it the country's most damaging natural hazard. Moreover, without concerted action, climate change threatens to dramatically increase the severity of flooding impacts.

This research has established that sustainability appraisal (SA) has a specific role to play in addressing flooding issues. A review of regional

spatial strategy SA reports (which are land use plans controlling the development and use of land in English regions) indicated that flooding impacts are being assessed. Significantly, evidence has been gathered to demonstrate that SA is having a positive impact on the preparation of these strategies. Indeed, in some cases SA led directly to planning policy changes that strengthened their approach to flood risk management.

These research findings, which are transferable to different SA and SEA systems, are significant for several reasons. Firstly, they provide evidence that SA is making a demonstrable positive impact in practice. Secondly, they demonstrate that SA (and SEA) can aid climate change adaptation. Finally, they show that SA (and SEA) can help human societies exist more sustainably in a world where flooding is a common occurrence.

410. (Paper)

**Environmental Impact Assessment (EIA) in the Philippines: Roads Taken, Lessons Learned for Mining Projects**

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The Philippines needs to balance economic development on one hand, and conserving and protecting its declining natural resources on the other. For this reason, the Environmental Impact Statement (EIS) System was established in 1977.

The Philippines is rich in mineral resources. In 1994, the estimated levels of metallic reserves amounted to 7B metric tons including gold, copper, and nickel (<http://www.nscb.gov.ph>). The mining industry's potential to contribute to economic development is significant.

In January 2004, the President issued Executive Order No. 270, providing for a National Policy Agenda for The Revitalization of Mining in the Philippines, reviving hopes and expectations for the recovery of the local mineral industry.

This paper presents lessons learned in the conduct of EIAs for mining projects in the Philippines within the context of project location, participation of non-governmental organizations (NGOs), presence of Indigenous Peoples in project area(s), and social acceptability issues.

Recommendations are presented: identifying actual stakeholders for a particular project; increasing awareness of stakeholders through information,



education and communications (IEC) activities; process documentation; transparency of project proponents; ensuring best practice management covering environmental management processes and social development efforts; and developing positive community relations early on.

498. (Paper)

**Halophyte Restoration: Effects of Small Groins for Enhancement of a Salt-Marsh Plant Community in the Western Coast of Korea**

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Effects of small groins made with naturally decomposable materials for enhancement of a salt-marsh plant community, an indigenous coastal wetland ecosystem developed, but has decreased in western and south-western mudflat of Korea, were examined. LIDAR (ILRIS3d, Optech), a laser optical measuring instrument for fine topography, was used to understand the adequate topographical condition of mudflat for seed distribution, germination, growth of halophytes and the effects of the groins on the community enhancement in Hampyung Bay and Donggum-do. Through two-year experiments in which we installed several types of the groins at each test groups, the area of the groins nearer to coastal line showed significantly higher density of the plants than further area and/or each parallel control groups. The individual growth mostly showed higher mean value in the experiment groups, even though the differences were not always significant. The highest effectiveness was observed in the pack and folding-fence typed groins. The results of plant population density and topographical data showed the small groins may effectively prevent the seeds from washing-out during the winter and lead to high germination rate, thus be proper tools for the halophyte community restoration.

441. (Poster)

**Light-Response of Krill, *Euphausia pacifica*, and Its Application to a Preventive Measure of the Mass Impingement to Cooling-Water Intakes of Power Plants with Remarks on Their Diel Vertical Migration and Ontogenic Migration**

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Large amounts of krill have often clogged the screens of cooling-water supply units to cause temporal interruptions of electric power production at Uljin Nuclear Power Plant. Our study showed they are also important food sources to demersal fish. Approximately 650 zooplankton-collections have made previously for EIAs from 1987 to 2005, however only very low density of the krill have been recorded, provably because inappropriate methods of collections have caused underestimation. We examined distributional patterns of the krill in the vicinity of Uljin newly using a multiple opening and closing net and an echosounder equipped with a 200 kHz transducer. The krill, *Euphausia pacifica*, dominated the biomass and often aggregated near the bottom of submarine channel and performed active diel vertical migration, showing shallow depth distribution around mixed layers at night. The distribution shifted to near-shore during the springs for spawning when the maximum chlorophyll concentration markedly increased, probably often causing impingement to the cooling water intakes. In the laboratory, the krill showed positive phototaxis to collimated light and higher sensitivity to shorter-wavelengths of visible light. It is suggested that we can induce the krill to far-away places from the intakes by using these behaviors.

175. (Paper)

**Strategic Environmental Assessment in Land Use Planning for Poverty Reduction: Lesson from Tanzania**

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Proper land use planning plays an important role in economic development and environmental conservation through reduction of conflicts among resource users, allocation of proper use of land parcels and support, thus conserving soil fertility and sustaining productivity.

SEA in Tanzania refers a holistic process for evaluating the environmental quality and consequences of alternative visions and development intentions incorporated in policies,

plans and programmes and ensuring full integration of relevant environmental, social, economic and political consideration for sustainable development.

Tanzania has developed a number of programmes, policies and plans, for natural resources utilization. However, resource utilization largely remains *ad hoc*: the economics of the country continues to rely on agriculture; and industrial development is hydropower based; that, is both industry and economic developments is dependant on water resources. The result has been the apparent prolonged drought and power shortage in the country. Government efforts to restore the situation have been relatively very expensive.

The paper reviews the relevant policies, plans and programmes on land use and poverty reduction in Tanzania and assesses their effectiveness. The identified weakness and shortcoming could largely be address through SEA. The paper draws lessons from the land use planning in Usangu basin in Tanzania.

554. (Paper)

**Socioeconomic Impact of Designating a Marine Protected Area in Korea**

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This paper reviews the socioeconomic impacts of designating Marine Protected Area (MPA), which is very seldom addressed in Korea. It is acknowledged that MPA policy is important for conserving marine resources, and supporting national biodiversity in Korea. It is anticipated that the number and size of the MPAs be increased, and MPA policies be more strongly implemented than the past because Korean government enacted a new law named 'Law on the Conservation and Management of Marine Ecosystem' on October 4, 2006. However, it seems that social conflicts may be increased in proportional to the degree of MPA policy implementation in Korea. The local communities and stakeholders may hesitate in designating MPAs in their own backyards when it causes them economical loss.

Saeng-do Island, a small uninhabited island located near Pusan City, is famous for its variety of marine flora, fauna, and ecosystems, and is a possible candidate for future MPA.

According to the underwater survey, three MPA alternatives were developed, and the economic impacts of each alternative on local communities were estimated when restricting fishing and recreational activities. The results suggest the optimal management alternative of designating Saeng-do Island MPA that conserve marine ecosystem while minimizing economical loss.

355. (Paper)

**A Session on HIA Capacity Building in the Mekong Countries**

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Lao PDR is a landlocked country in SEA. The Mekong River flows through the length of the country, and the geography creates a huge potential for hydropower generation. The government adopted the MDGs to eradicate the poverty status in the country by emphasizing socio-economic development. HIA plays the main role as a tool to enhance the peoples' good health per MDGs that refer to Bangkok Charter in August 2005. The need for HIA in parallel with EIA is crucial to mitigate the negative impacts to health. In line with the objective to strengthen local capacities, two WHO and DBL sponsored and led HIA workshops, which included many key government stakeholders, were held in March 2003 and training was organized in October/November 2003. The National HIA Policy has been developed in parallel with other policies on field learning and practicing. Yet in March 2006, the National HIA Policy has been approved by the Prime Minister with the Ministry of Health acting as leading agency. In November 2006, the National HIA Policy Launching Workshop was organized with the participation by various ministries where the workshop outputs would be the keys results to develop and apply the National HIA Policy into practice.

472. (Paper)

**Application of Multi-Objective Evaluation on Selecting the Program Project: A Case in Environment Impact Assessment of Dianzhong Delivery Water Project**

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This paper introduces the method of the multi-objective evaluation, using the example of the selecting transfer waterline in the environment impact assessment of Dianzhong delivery water project. The emphasis was on the ubiety between the transfer waterline and the ecological sensitive zone, The water and soil loss in the area where the waterline went through established the multi-objective evaluation matrix on each waterline subsection, which was based on analyzing the regional economy and environment. According to

the evaluation results, we choose the best waterline. The results showed that this method possesses definite theoretical value and reliability in practice.

470. (Paper)

**Analysis of Three-Side Dynamic Iterative Game Theory of Many Phases in EIA**

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The EIA system has been established in China; however, it still has many disfigurements. In execution, EIA refers to the different attitudes of the participants whose optional strategy may be described by a correct game model. According to disfigurements in EIA, a three-sided dynamic iterative Game Theory of many phases is established referring to iterative Game Theory, dynamic Game Theory of incomplete information, and perfect Bayesian equilibrium theory, to analyze the reciprocity relation of government, EIA organizations, and corporations to find the causes that are disabling EIA and to propose policy suggestions advancing EIA validity.

The results show that in a short period, government and corporations achieve an economy benefit between social benefit and economy benefit. Neither want to pose social cost, which results in their not practicing EIA. EIA organizations' incomes are based in corporations, and pursuing economy benefits causes the relationship between them to realize economy income. In the long run, social benefit loss caused by environmental pollution must be recuperated and environmental deterioration will influence the economy benefit, so government and corporations pursue high social benefit, and they both want to practice EIA to increase the economy benefit. EIA organizations will fairly assess when their economy benefit is ensured.

423. (Paper)

**Analysis and Simulation of Landscape Change in Dianchi Area, China**

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Landscape change was quantified for the last 30 years within and in the Dianchi area, using rectified aerial photographs, GIS and landscape ecology. Landscape change was projected for the next 15 years using Markov chains. The results showed the glebe field, grassland and bare land decreased greatly, while the other kinds of landscapes increased. In the past 30 years, many grassland and glebe fields converted into the forest land, while many croplands were mainly converted to urban settlements and the area of cropland decreased sharply. Certain landscapes changed in recent years and the connectivity among patches was good; the distributions of each landscape type were more separate and the landscape pattern was very frangible in study area. These changes observed may be related to the success of policy control and the increasing of people and economy in the study area. And the simulated result showed that cropland, grassland and bare land will keep on decreasing; however, forest land and construction land will continue to increase. According to results, the landscape pattern can be adjusted, which may serve as a scientific basis for land planning and management of the recent study area.

439. (Paper)

**Economic Growth, Energy Consumption and Pollutant Discharge Quantity Control of China**

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In the Eleventh Five-Year Plan (2005~2010) of China, economic growth is still the focus of development. The Eleventh Five-Year Plan of China proposes to reduce energy consumption by 20% and decrease pollutant discharge quantity (PDQ) by 10%, along with increasing annual GDP growth 7.5%. However, provinces present different lower goals of reducing energy consumption and

controlling PDQ, most with various higher annual GDP growth speed. The Economy, Energy and Environment model is applied to predict energy requirement and PDQ during the eleventh five years, and results show that with the higher GDP growth speed, the goals of reducing energy consumption and PDQ can not be achieved. According to the Eleventh Five-year plan, our study selects sulfur dioxide and chemical oxygen demand (COD) as PDQ control indicators and builds the GDP model, based on the real condition of PDQ and the hypothesis that energy consumption in 2010 was reduced by 20% in 2005. Compared with the Eleventh Five-Year plan on PDQ control of China, the GDP-PDQ model shows that some provinces' PDQ control goals are not quite reasonable.

729. (Paper)

**Scottish Experience in Procurement and EIA of Roads**

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The Private Finance Initiative (PFI) was launched in the UK in 1992. The purpose of PFI is to deliver better and more cost-effective public services by introducing private sector skills into project delivery and management. In the UK these public-private partnerships have been used to take forward a wide range of public infrastructure, including hospitals, schools, sewerage projects, and roads.

PFI and Design and Build (D&B) contracts have been used to procure trunk roads in Scotland since the late 1990s. This method of procurement has resulted in changes to road design and, in consequence, to the way environmental impact assessment (EIA) is undertaken, reported and implemented. Where previously EIA has been undertaken of a relatively detailed design, now EIA is based on a set out desired outcomes.

This paper sets out Scottish experience in carrying out EIA in a PFI and D&B environment. Key issues, based on lessons learned to date, are identified and described. These include: the level of project design detail available and the issue of design prescription, the management of uncertainty, identification and implementation of mitigation measures, and the drafting of contractual requirements. Examples are provided from the experience of the authors.

731. (Paper)

**Application of SEA to Different Types of Plans, Programmes and Strategies: Experience in Scotland**

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Strategic environmental assessment (SEA) of plans and programmes has been required in Scotland since July 2004. With the coming into force of the Environmental Assessment (Scotland) Act 2005, however, the scope of SEA is now significantly wider. The Act requires SEA to be undertaken of policies and strategies as well as plans and programmes in Scotland.

As a result, SEA is undertaken of a wide range of plans, programmes and strategies (PPS). These range from relatively detailed master plans and land use plans to high-level strategic policies. Although the stages in the SEA process remain the same, the scope and level of detail varies depending on the tier in the hierarchy to which the PPS belongs.

This paper provides an overview of the approaches to SEA taken forward for different types of PPS. It sets out the scope of SEA in Scotland, briefly describes the types of plans, programmes and strategies for which SEA has been undertaken, focuses on the similarities and differences of approaches and methods utilised, identifies some of the challenges and lessons learned to date, and considers the effectiveness of SEA applied in this way. Examples are taken from the SEA of national policy.

730. (Paper)

**Experience of SEA in Scotland**

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Strategic environmental assessment (SEA) has been undertaken in Scotland since July 2004. However, in February 2006 the Environmental Assessment (Scotland) Act 2005 came into force. The Act requires SEA to be undertaken of policies and strategies as well as plans and programmes in Scotland. This makes the scope of Scottish SEA wider than that required by the European SEA Directive.

The Act identifies three authorities to be consulted at specified stages during the SEA process, of which Historic Scotland is one. Historic Scotland has therefore had the opportunity to review the majority of SEAs undertaken since July 2004.

The purpose of this paper is to provide an overview of SEA experience in Scotland since July 2004. The paper provides an introduction to SEA in Scotland; describes the changed procedure; sets out the roles and responsibilities of the different players; identifies the types of plans, programmes and strategies for which SEA has been undertaken; and considers the challenges faced by many authorities in taking forward a relatively new environmental assessment procedure.

649. (Poster)

**Application of Index of Greenness in Streetscape on the Environmental Impact Assessment of Seoul**

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The purpose of this research is to analyze practicality of the IGS (Index of Greenness in Streetscape) in EIA through case study of practices in that of Seoul. IGS is a new index which directly expresses humans' perceptions of plants in a street and defined as the area ratio of which leaves of plants occupy in an eye-level view of a person standing on the center line of a street. In this research all the 42 cases of 3 step reports including plans, drafts, and final reports which had been passed through the EIA procedure of Seoul was analyzed. The results were as follows: not in the drafts but in the final reports, in all the cases the minimum requirement (25%) was fulfilled. In almost all cases, the changes of the IGS values were clearly positive. In the drafts, frequent mistakes such as unsuitable picture composition, unsuitable sample points, and inconsistency of the planting plan with the simulation result were found, but all of them were corrected in the final reports. It was verified that the IGS is a very practical index to promote green streetscape, but in order to guarantee an achievement, a thorough investigation of reports is needed.

654. (Poster)

**Applications of Biotope Area Factor on the Environmental Impact Assessment of Seoul**

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The purpose of this research is to analyze practicality of the BAF (Biotope Area Factor) in EIA through case study of practices in that of Seoul. The BAF expresses the ratio of the ecologically effective surface area to the total land area. In this calculation, the individual parts of a plot of land are weighted according to their ecological value. In this research, all the 42 cases of 3-step reports including plans, drafts, and final reports which had been passed through the EIA procedure of Seoul was analyzed.

The results were as follows: not in the drafts but in the final reports, the case the minimum requirement was fulfilled. In almost all cases, the changes of the BAF values were clearly positive. During the early years frequent mistakes were found in the drafts, but all of them were corrected in the finals. Recently the frequency of mistakes decreased remarkably. The scale-down tendency in the area of the surfaces with vegetation connected to soil below was obvious; therefore it is necessary to assess the area separately from BAF. It has been proved that the BAF is a very practical index to promote ecological value in EIA.

392. (Poster)

**Improving Korean EIA Related to Military Facilities**

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This poster analyzes previously conducted EISs on military facilities and, more specifically, fire training sites and proposes an alternative to them. Many problems have hampered military-associated EIA. For instance, how to define the proper scope of projects and how to handle military confidentiality made it difficult to properly implement EIA in projects related to military facilities. Moreover, how to find a way to involve diverse stakeholders has been considered as crucial and problematic.

Thus, this poster intends to propose an alternative to problems mentioned above. First, participation in an environmental council from diverse stakeholders—local community, environmental agency and MND (Ministry of National Defense)—has to be institutionalized within EIA implemented by MND. Second, the probability error should be applied to promote effects prediction, mitigation and reliability. This will, in turn, improve EA methods on military-associated projects. To implement above suggestions, a set of guidelines must be established in MND EIA system. Ultimately, if these suggestions are implemented properly, it will not only be beneficial for MND that will execute military trainings conscious of environmental impacts, but also for the public, who will reclaim their constitutional rights such as property right and environmental right

705. (Poster)

**High-Efficiency Constructed Wetland Using NPS in Cambodia**

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High-efficiency constructed wetland using NPS (NEWS Process Substrate) is suitable for the wastewater treatment in farm or mountain districts as it does not require energy or specialists for maintenance and can be harmonized with environment. In order to validate the efficiency, this study will be applied in Cambodia where supply ratio of drainage system is low. It is expected that the efficiency of wetland in Cambodia will be high since its climate conditions are suitable for the growth of plants and activation of microorganisms. In the settlements of Cambodia, people use underground water for drinking and discharge wastewater near the source of underground water, which contaminates the underground water resulting in spread diseases. Furthermore, other types of wastewater treatment system are, in fact, almost impossible since the electric power is not available. In February 2007, a high-efficiency wetland was constructed in the Prey Veang village near Phnom Penh, Cambodia, as a pilot installation, to evaluate the efficiency. High-efficiency wetland may be utilized very usefully in fast urbanizing areas of developing countries.

488. (Poster)

**Dangsan Forest as an Environmental Factor for Coast Areas in Korea**

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Dangsan forests are the places where the Dangsan festival is held, and they are a unique cultural asset of Korea with a history more than several hundred years. Although many Dangsan forests have been degraded by physical damage and the Dangsan festival has declined in many villages, lots of people in coastal areas have maintained Dangsan forests to the present. There are a lot of coastal sandbar areas along the south and west coast. The coasts are under development in large scale. Many coastal sandbars have been eliminated by reclamation projects for agricultural fields or resort complexes. The environmental impact assessments for the tidal land reclamation focus more on physical factors and

less on ecological aspects. Less consideration has been given to the traditional culture of coastal areas. This paper emphasizes that we have to conserve coastal areas with Dangsan forests. Reclaiming coastal areas into land will not only degrade environment, but also damage cultural landscape. This paper introduces several sites in Jeonla Province, showing the beauty of Dangsan forests in coastal areas and their importance in the management of the areas. As a cultural landscape, Dangsan forests can provide multiple advantages to the local people in coast region toward a sustainable future.

458. (Paper)

**Global Warming, Urbanization, and Heat Waves**

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Increase of global surface temperature due to anthropogenic emission of greenhouse gases may cause many adverse effects on our life, socio-economic activity, health, and others. Moreover, urbanization in the large cities may enhance the warming effect and its strength because of release of anthropogenic heat and land use change. Episodic events of heat waves have been mainly reported in the large or mega cities (e.g., Paris, Chicago, etc.). In this paper, the impacts of global warming and urbanization on human health are investigated. In major cities of South Korea, heat-related mortality was analyzed and statistically estimated. The results show that the acclimation effects are closely related to the latitudinal location of the cities. Especially, the excess deaths due to abnormal heat waves appears in Seoul and Incheon metropolitan cities. The climatic cause of recordable heat waves in South Korea and early warning system of heat waves will be presented.

574. (Paper)

**Alternative Analysis (Cost-Benefit Analysis in EIA in regard to Road Development Project in Korea)**

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In planning road building, as one of public investments in infrastructure, the Korean

Government is obliged to carry out environmental impact analysis (EIA), accompanied with cost-benefit analysis in project evaluation. However, the Government does not have the system which can reflect environmental impact caused by road building to cost-benefit analysis (CBA) in project evaluation. As a result, CBA does not appropriately show environmental impact that is important in EIA. In this article, I will try to show what different result can be achieved if we include environmental impact in EIA.

*Methodology*

- A. Money Unit to Transfer EIA Results
- B. Cost-Benefit Analysis

*Summary of data*

CBA of environments and economic feasibility in Chuncheon-Yangyang highway project as follows:

- A. Government result: B/C = 1.442/ NPV=10,539 Korea Won
- B. Research result: B/C= 0.75/ NPV=-6,613 Korea Won

*Conclusion*

The Government says that Chuncheon-Yangyang highway project has economic feasibility. I came to the conclusion, after considering environmental impact obtained from EIA data, Chuncheon-Yangyang highway project does not have economic feasibility. Therefore, the Government need hereafter consider reflecting on EIA data when they carry out public investments.

459. (Poster)

**Analysis of Ecological Characteristics about Major Estuaries in Korea Based on the Aquatic Insects Assemblies**

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Based on the aquatic insect assemblies reported since 1970, we analyzed ecological characteristics and current situation of about major 16 estuaries in Korea. A total of 71 families of aquatic insects were identified in the estuaries. There were identified relatively abundant 48 and 40 families of aquatic insects in estuaries from Han and Nakdong rivers respectively. And there were identified relatively poor 6, 5 and 4 families in Dongjin, Mangyeung and Sumjin rivers respectively. Relatively high EPT rate was analyzed in estuaries from Samchuk\_Osib (76.5%), Youngsan (69.2%), Yangyang (66.7%) and Gangnung (60.0%) respectively. It reviewed most estuaries have been disturbed by human impacts in FFG analysis (shredder versus total collectors ratio, predator versus other groups, shredder percentage, collector percentage). Relative resistance was analyzed 4.37 to 6.78 (average 5.71), and relative

resilience 5.21 to 7.18 (average 5.98). A total of 16 estuaries were categorized into 3 groups by statistical analyses (Principle Component Analysis, Redundancy Analysis and Clustering Analysis). Results of statistical analyses contained ecological characteristics and current research situation of estuaries, and also indicated the useful indicator for further study.

457. (Poster)

**Environmental Consideration of Small Hydropower(SHP) Plant Construction**

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In Korea, forty-four SHP plants have been built and operated deom 1982 until now. We examined problems and undesirable effects on the river ecosystem that resulted from construction and operation of SHP plants in Nakdong river. The operating SHP plants caused negative impacts to river ecosystem in terms of ecological, physical, and scenic aspects. Until 2012, the target of SHP energy production that the government plans can be achieved by constructing 181 sites of 3,000kW SHP plants in the national river. This suggests that various alternatives to replace the development of the SHP plants should be considered in the planning of the future energy policy. Other alternatives of the SHP would be to utilized a sewage plant, a clean water plant, and various reservoirs which were already present. If the SHP plants are inevitable in the national river, a tributary which has a proper size of catchment may be considered to utilize.

587. (Paper)

**Preliminary Assessment of the Economic and Environmental Impacts of a Canada-Korea FTA**

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This note analyses the possible economic and environmental impacts of the proposed Canada-Korea free trade agreement (CKFTA). The economic impacts of tariff elimination are assessed based on simulations using a computable general equilibrium (CGE) model—the Global Trade Analysis Project (GTAP) and its database version 6.0. The environmental impacts are assessed by linking the CGE model-calculated changes in the structure and volume of Canadian economic output to Statistics Canada's environmental accounts (EA). The impact of non-tariff elements of an FTA is estimated drawing on estimates of the impact of FTAs in the economic literature using the gravity model of trade. The analysis takes into account the impact of the start-up of Korean automobile plants in North America as well as the impact on bilateral Canada-Korea trade of the expiry of the Agreement on textiles and clothing.

440. (Paper)

**Outcomes and Complexities of the EIA of a Large Hydropower Project in Mexico: The Implications of Introducing an Interdisciplinary Approach and the Benefits of Public Participation in Its Early Stages**

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The Mexican Federal Electricity Commission (CFE) requested the University of Guadalajara to coordinate the EIA of the large hydroelectric project "La Yesca," proposed to be built on the Santiago river watershed in Western Mexico, a river system fragmented by many other dams. To accomplish this EIA, a working group of 60 specialists was selected.

The EIA methodology fulfilled the requirements of the Mexican project evaluation system but also integrated international best practices. The specialists had different areas of expertise as well as different levels of experience regarding EIAs; therefore, a series of interdisciplinary workshops were developed aiming to identify and evaluate relevant environmental and social impacts through the interaction of the group members and the process of mutual learning. Also, a public consultation process with different stakeholders and communities potentially affected by the project was introduced since the first stages of the assessment. As an outcome of the whole process, a communication program with multiple stakeholders was designed, and a watershed environmental cumulative effect monitoring plan is currently implemented.

This paper will discuss the complexities of introducing an interdisciplinary approach and a public participation process, as well as the local capacity building effect and integrative research programs derived from it.

585. (Paper)

**SEA of a Problem: Climate Change**

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Societies always try to minimize risks of decision making through the development of tools that attempt to forecast the future. Analysed in a large historical framework, environmental impact assessment as well as strategic environmental assessment might be considered as two of the most important and effective of these prospective instruments.

A common characteristic of prospective studies is that they are often based on the design of future scenarios. The base scenario is usually a more or less complex version of the so-called business as usual (BAU) approach. Upon the BAU scenario, an optimistic and a pessimistic trend are added, defining the upper and lower limits of the future. As a result, in most circumstances future is an extrapolation of present trends.

The inclusion of collapse scenarios is seldom considered by the authors of prospective studies. Presently it is possible to identify a major environmental force that might reveal unexpected trends in the near future: climate change. Methodological tools developed for strategic environmental assessment have been applied in the evaluation of policies, plans and programs. In this paper these tools will be applied to assess impacts of climate change at the metropolitan scale.

545. (Paper)

**The Role of Environmental Impact Assessments in Onshore Pipelines**

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Promotion of Environmental Impact Assessment as a mind-set rather than a one-off process. Typically EIA is used during the design phase of a project, often as more of a desk study rather than field assessment. The publication is seen as a closed piece of specialist work, rather than the basis of a living document that changes with construction



project as it develops. This approach militates against the involvement of non-environmentalists. In order to promote environmental issues it is important that an assessment of environmental impacts is incorporated into a 'way we do business' at every level. A construction project is a close-knit multidisciplinary team, including engineers, company managers, welders, and labourers as well as environmentalists. It offers an ideal opportunity to achieve integration and acceptance of an impact assessment mind set.

By sharing such a 'case study' this paper aims to encourage discussion on the next stage of EIAs - the promotion of a generally accepted mind set that automatically considers environmental impacts as well as short term financial impacts.

130. (Paper)

**The First Step Toward Biodiversity Conservation in Shell Nigeria: The Biodiversity Action Plan for the Gilli-Gilli Forest Reserve**

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Biodiversity conservation, a pillar of sustainable development, is emerging as a global environmental challenge of the century. In Nigeria, the Natural Resources Conservation Act 50 of 1989 focuses on the development of guidelines for the coordination of activities for natural resources management. The National biodiversity Strategy and Action Plan aims to reduce poverty and facilitate the beneficial growth of the Nigerian biodiversity.

Shell group considered biodiversity a key business performance indicator and in May 2000, became the first energy company to publish guiding principles: the Shell Group Biodiversity Standard. This states Shell's commitment to working with others to maintain ecosystems, respecting the basic concept of protected areas and seeking partnerships to enable the group make a positive contribution towards the conservation of global biodiversity. Additional commitments were made in August 2003. In 2005, Shell Nigeria developed the Biodiversity action plan for the Gilli-Gilli forest reserve in the Southwest of Edo State, consistent with her corporate biodiversity strategy and group standards. Located within this reserve is SPDC's Oben field comprising 33 wellheads, a 60,000bpd flowstation and 90mmscf/d gas processing plant. The development of this plan is discussed.

637. (Poster)

**Mangrove Re-Vegetation in Shell Nigeria 1996 - 2006**

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The Niger Delta mangrove covering about 6000 km<sup>2</sup> is largest mangrove forest in Africa, and the third largest in the world. It is the least disturbed of the delta's four major ecological zones and serves as a vital feeding and nursery ground for a wide variety of fin and shellfish. About 5-10 percent of its size has been lost to urban and industrial development. Oil and gas exploration and production activities within this region mainly involve dredging of channels and slots for wells and pipelines, and cutting of seismic lines by several oil companies.

In 1996, Shell Petroleum Development Company Nigeria began a mangrove re-vegetation pilot study for full understanding of process to ensure the conservation of the sensitive mangrove ecosystem. Since that time, over 5,000 km have been replanted with mangrove seedlings cultivated in nurseries. Though re-growth is very slow, the average survival rate is about 70% when seedlings are protected and dead plants replaced. Plant losses are due to trampling by humans, while monkeys and crabs devour the young seedlings.

449. (Paper)

**Experiences from Introducing Changes and Improvements of the EIA Systems in 6 Asian Countries, with Particular Focus on Improvements within Public Participation Processes (Indonesia, Iran, the Philippines, Sri Lanka, Thailand and Vietnam)**

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The purpose of the paper is to show and discuss experiences in different Asian countries from introducing changes and improvements of the EIA/SEA systems. The presenters will be 5 - 10 Asian participants in the EIA and SEA Alumni Follow-up Workshop, to be held in Hanoi, Vietnam, May 28 - June 2, 2007. The presenters have previously participated in one of the 5-week International Training Programme arranged in Sweden by Ramboll Natura and financed by the Swedish International Development Cooperation Agency. The majority of the presenters are decision-makers and specialists in environmental authorities and environmental organizations, as well as planners and managers in environmental divisions within central or local authorities, and sector ministries or organizations. As part of the International Training Programme each participant developed a "change project." One of the objectives of the Follow-up Workshop is to exchange experience relating to the participants' "change projects" and institutional change processes in general. The Workshop will also deal with the "Managing Change" concepts relating to organizational dynamics, and how networking may assist participants in improving the use of EIA and SEA within their organizations.

317. (Paper)

#### **CDM and SEA: Potential Programmatic Future?**

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In development policies, transport is closely linked to economic progress. As the externalities of transport activities include numerous health hazards and environmental harms, decoupling of welfare and transport growth is necessary. While the project portfolio of the Clean Development Mechanism (CDM) is expanding rapidly, the transport sector has so far played a rather minor role. This paper explores in how far and what kind of sectoral approaches to the CDM may provide a framework to link transport planning in developing countries and discuss the potentials of SEA as a useful tool in a programmatic CDM application. Permitting sectoral programmes and plans under the CDM may allow for the implementation of comprehensive measures such as transport master plans that can enable a variety of activities impacting transport trends significantly.

The paper based on a study for the German Ministry for Environment and was presented on a side event on the United Nations Climate Change Conference in Nairobi last year. The presentation will concentrate on the contribution of SEA as a major tool for a sectoral CDM approach in the transport sector.

533. (Paper)

#### **SEA in China - A Contribution to Environmental Policy Integration?**

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Sustainable planning depends on two closely related mechanisms that have been central to the EU efforts to promote sustainability, and are at the heart of this Action: Environmental Policy Integration (EPI) and Strategic Environmental Assessment (SEA). In China, SEA has been recently legislated for (EIA Law 2002) and the medium to long-term intention of the State Environment Protection Administration (SEPA) is to develop this as a mechanism that will promote both the assessment of plans for transport and energy (amongst others) but also strengthen the capacity of sectoral institutions to integrate environmental concerns in their everyday activities of planning and implementation.

The paper based on the action under the Asia Pro Eco II Initiative from the European Commission. The presentation will focus on the project aims and key thesis how to improve the Chinese SEA system through: a) the inadequate reflection of environmental policy objectives due to familiar problems of fragmentation of responsibilities and the weakness of the environment as a cross-sectoral priority, and b) the need for information and

knowledge of technical/practical solutions that can lead to immediate improvements in the development of sectoral plans.

415. (Paper)

**Challenges in the Development of Landscape Indicators for Local Authority SEA Reporting**

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SEA Directive (2001/42/EC) is intended to ensure that the individual policies within plans and programmes are complementary of one another in achieving the aim of sustainable development and fulfil the requirements of local to international sustainable development goals.

The need for sustainable development and particularly for indicators of sustainability is a key requirement to implement and monitor the development of such plans and programmes.

Landscape assessment and evaluation for planning and decision-making processes are important issues pertaining to sustainable landscape management. The question of landscape complexity is central to any attempt to qualify, monitor and manage large databases and indicators describing the landscape.

The DPSIR framework using GIS was developed to integrate and amalgamate baseline data and indicators geographically allowing spatial analysis. This conceptual framework and methodology is made up of internationally adopted principals, assessment criteria, and measurable indicators that were derived from landscape data within the local authority region. Testing and validation through a case study scenario for Kilrush town and environs (Co. Clare, Ireland) highlights the advantages and limitations of this conceptual framework and indicators for SEA reporting.

659. (Paper)

**Creating Inclusive Environmental Assessments in Canada: Examples from Northwest British Columbia**

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The British Columbia Environmental Assessment Act (BCEAA) requires careful consideration of potential development project effects on the Province's Aboriginal populations. The Act also outlines particular requirements for consultation with First Nations and the integration of Traditional Knowledge into the environmental assessment.

This paper considers the Act and the translation of its requirements into actual environmental assessments. Using examples from northwest British Columbia, the paper will discuss how First Nations are involved in different aspects of the EA process, how First Nation's knowledge, issues and concerns are integrated and how effects on their livelihoods, territories and environments are assessed. The paper will also present examples of how First Nations themselves are engaging in the process and the challenges they face.

The paper will conclude by looking at the challenges faced by the provincial environmental assessment process and all its players, where multiple developments are proposed in one traditional territory area.

660. (Paper)

**Enhancing Conservation through Integrated Social and Environmental Assessment: A Case Study from a Mining Project in Argentina**

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On April 30, 2006, a new generation of social and environmental standards for international projects came into effect constituting a significant change to the practices of natural resource companies working in non-OECD nations. The improved and expanded IFC standards employ an outcomes-based approach and strengthen social and environmental policy, which at the same time, present new challenges for proponents, practitioners and regulators.

This paper draws on the authors' experiences of preparing one of the first social and environmental assessments under the new IFC guidelines for the Agua Rica mine in northwest Argentina. It discusses how the project team addressed the new requirements and associated challenges. The paper will highlight how the meaningful integration of social considerations contributed to the overall assessment process. The approach and methodology developed, which focused on the identification and assessment of principle issues and effects rather than a segregated disciplinary approach, will be presented. The outcomes and subsequent benefits of the process will be offered.

In particular, the paper will argue that a multi-disciplinary understanding, and therefore management, of effects can enhance the long-term conservation of both environmental and social aspects potentially influenced by the project.

432. (Paper)

**The Legal Design of Belgian Impact Assessment Systems: Fit for Good Governance?**

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Due to its constitutional structure, Belgium is a federal state. As a consequence, impact assessment requirements needed to be introduced at several policy levels. Furthermore, impact assessment requirements have been initiated in several policy fields. Whilst historically environmental impact assessment has been the most obvious and legally unavoidable approach, during the past decade new IA forms were initiated such as children impact assessment, gender impact assessment, regulatory impact assessment, sustainable development IA, etc.

This proliferation of IA approaches happened without much reflexion. In the presentation we will present an overview of the existing Belgian IA systems within a comparative perspective. Similarities and differences regarding the institutional design features of the different regional/national/sectoral IA systems will be highlighted.

However, Belgian case law concerning IA is not so abundant; a particular administrative court decision has revealed an interesting element of the "Belgian" IA practice. This case will be introduced and commented, as it illustrates also the "responsibility issue" in impact assessment. Quality remains a critical element of any IA system. All stakeholders need to act in a responsible way in an IA process, but how to ensure, or at least to enhance such a governance requirement ?

186. (Paper)

**An Assessment of the Effectiveness of the Environmental Monitoring System in the Halsema Road Rehabilitation Project in the Philippines**

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The study aimed to assess the effectiveness of the Environmental Monitoring System (EMS) of the Halsema Road Rehabilitation Project (HRRP), a

World Bank funded road project in the Philippines, with particular emphasis on analysing the effectiveness of the Multipartite Monitoring Team(MMT) in performing their monitoring task particularly monitoring environmental issues and mitigating measures applied during road construction. Specially, the study will determine the strengths and weaknesses of the EMS thru the MMT's performance in order to improve the monitoring system for future DPWH projects.

Under the Philippine EIS, the Department of Environment and Natural Resources-Environmental Management Bureau is mandated to monitor project while the project proponent has also a significant role in the monitoring system and shall organize the MMT to function as autonomous monitoring team.

The study will provide sound and stronger basis in institutionalizing the multipartite monitoring system, particularly the ECC-issued development projects. Also, this will enable the policy makers to formulate relevant and workable rules and regulations, as well as courses of actions that could be employed to further incorporate and mainstream local involvement in environmental monitoring system.

623. (Paper)

**An Online Guide for Inclusion of Health in EIA/SEA**

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There is a formal obligation in the Netherlands to include health aspects in EIA and SEA. However, the legal framework does not state it in a very specific way and hence the topic is not widely addressed in EIA and SEA work.

A web-based guide was developed to assess which health aspects have to be considered relevant in projects, programmes or proposals that require an EIA or SEA. The aim is to promote a broader attention to health determinants (including social determinants, lifestyle and access to health care) and implement them in EIA/SEA.

The guide is currently tested in the screening phase of several real-life projects where IA is required. The set-up of the guide and first test results will be presented at the IAIA conference.

262. (Paper)

**SERPENT of the Deep – Best Practices in Research, Monitoring and Partnerships for a Deepwater Well off Atlantic Canada**

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The Orphan Basin is a remote deepwater area located 390 km from St. John's, Newfoundland and Labrador, Canada. Chevron Canada Limited's (CCL) Great Barasway well was the first Canadian participation in the international SERPENT Project. SERPENT utilizes Remotely Operated Vehicles (ROVs), or remotely controlled submersibles which are the "eyes" and "hands" of a deepwater drilling operation, to collect scientific data which would be prohibitively expensive or impractical for research institutions to collect.

This has been a collaborative effort between CCL and Memorial University of Newfoundland, the University of Southampton, the Canadian Department of Fisheries and Oceans and the Canada-Newfoundland and Labrador Offshore Petroleum Board. This has been an open relationship whereby all parties have been involved in the study design, and data have been freely shared. Initial results have verified environmental assessment predictions and have included world class digital photographs and video of the organisms that live in water depths of 2,338 metres (7,700 feet). This has expanded the range of several species of deepwater fish and when sediment samples are analyzed may result in the discovery of rare or new species of deepwater benthic organisms.

Additional information can be found at  
www.serpentproject.com.

307. (Paper)

**Development of Alternatives for Use in Strategic Environmental Assessment**

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The Strategic Environmental Assessment (SEA) Directive (2001/42/EC) requires the assessment of likely significant effects on the environment of implementing plans or programmes and reasonable alternatives. While the SEA regulations and guidelines emphasize rigor and objectivity in the assessment of alternatives they have little to say on the actual development of alternatives. Therefore, criteria should be established which would aid decision makers in the development and analysis of alternatives appropriate to the tier of decision making.

A theoretical methodology is presented for developing generic SEA alternatives for a proposed plan or programme. Specifically, the methodology includes a set of alternatives development criteria and decision support framework. The emphasis is on land use planning but the methodology is also applicable to other sectors such as waste management. The outputs from this will help focus on the development of more sustainable alternatives.

537. (Paper)

**Political Contention, Public Participation and Political Mobilization: The Matola Hazardous Waste Incinerator**

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The paper approaches EA processes as examples of contentious politics. The paper suggests that although EA regimes often give scope for public participation the effectiveness of public participation is conditional upon characteristics of the political regime and characteristics of the public mobilizations that take place around each particular EA. A framework is presented based on several cases in developing countries where public participation in EA processes has been associated with the blockage of large-scale development projects. The framework is then applied to the case of the Matola Hazardous Waste Incinerator Project in Mozambique a case of successful civil society resistance which contributed to the emergence of Mozambique's first environmental NGO.

156. (Paper)

**Anthropogenic Impacts on Pristine Socio-Ecological Whole-System Facing Directional Changes: Strategic Environmental Assessment in Bhutan Himalayas**

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'SAFE Indian chapter' is a non-profit non-government organization working towards sustainable environmental development in South Asia.

To enhance sustainability, anthropogenic impacts must be considered as integral component of socio-ecological system. Testing simple whole-system models facilitate multivariate intercommunications across ecological and social factors. Bhutan, being a unique biodiversity hotspot of the world, shares major responsibility of nature conservation and has already framed policies to address the situation. But to equate economic development with conservation, the nation has opted for sustainable development strategy based on international partnership, reciprocity and national participation. A simulation model has been drawn here to evaluate resilience thresholds of socio-ecological sustainability. Dependence of rural people on Himalayan resources demands more planning, if biodiversity is to exist in future for increasing populations and their demands on natural resources. Saturation of arable land for production, deterioration of grazing resources with rising demands of livestock products, severe mountain erosion caused by urbanization, and waste disposal with expanding urban belts have opened up new frontiers of ecological crisis in fragile Himalayas. While real pristine forests must be protected from vested interests, the foundations of sustainable forest conservation must be built on principles of social justice and decentralized participatory governance. It is therefore important to develop plausible scenarios of future changes in socio-ecological whole-system facing directional changes.

734. (Paper)

**A Framework for the Assessment Of Biofuels's Sustainability: The Case of the Best Project**

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Interest in biofuels is gathering pace around the world, stimulated by the recent rise in oil prices, wider energy security worries and climate change concern. Biofuels appear to offer a mature alternative to oil-based transport fuels, which can at the same time substantially reduce GHG emissions at reasonable cost. Under these assumptions, a host of policy initiatives are underway within Europe to increase the proportion of biofuels used in transport over the next decade.

Under this perspective, the BEST (Bioethanol for Sustainable Transport) project will entail an extensive substitution of oil fuels for bioethanol, leading to a market breakthrough across Europe. The project includes experiences from Brazil and China.

This paper presents sustainability assessment framework to evaluate sustainability in the BEST project. This entails evaluating broader sustainability objectives as well as the project's main objectives, data and outcomes against four sustainability criteria: social, environmental, economic and policy.

The sustainability assessment has been coupled with some indicators from the Lisbon Criteria as well as with some initiatives within the UK and the European Union (e.g., LowCVP) regarding the development of an Assurance Reporting Criteria to ensure a sustainable production and use of bioethanol through life cycle assessment.

658. (Paper)

**Towards Sustainable Electricity Projects: The Establishment of Strategic Environmental Assessment in the Federal Commission of Electricity, Mexico**

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In Mexico, the Federal Commission of Electricity (CFE) is the main utility, covering almost all the country. Since 1988, CFE has made environmental impact assessments for many electric projects (power plants, electric lines, substations, etc.). In 2006, CFE introduced a Strategic Plan for Sustainable Development, which is an institutional program. Under this Plan, CFE has initiated to introduce the Strategic Environmental Assessment in order to incorporate the environmental variable in the electricity sector substantial processes. This paper shows the general outline of the next step. We will take advantage of the great CFE experience in: having made hundreds of EIAs, planning each year the Mexican electricity development plan for a 10-year horizon, and having assessed the social

impacts of our main projects. The first phase of this program will be to introduce SEA into the architecture of the Works and Investment Program for the Electricity Sector (POISE) and develop a monitoring program in order to measure changes in the POISE integration and implementation. Company experts in planning, EIA and SIA will participate, but an international consultant with expertise in the electricity sector will be needed in order to end up with a specific, holistic strategy for CFE.

149. (Paper)

**Build Up a Suitable Model for Health Impact Assessment on Current Situation of Vietnam**

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In Vietnam, many new plans, projects and policies (called projects) are promulgated each year. These projects contribute an important role to the development of the country. However, many of them have a significant impact on people's health. Currently, Health Impact Assessment (HIA) does not apply for new projects. It is only a small part in the environmental impact assessment procedures and it is often ignored. HIA is a useful tool for assessment of health impact of projects. It is ideal if HIA was carried out before projects begin. However, it is difficult to apply HIA to this period because the process is often short. Moreover, many existing projects clearly affect people's health. Therefore, in Vietnam, the most important thing is assessment of the health impact of existing projects in order to reduce health impact as much as possible, then making HIA a compulsory regulation to any new projects. There are some models of HIA; however, these models are not easy to apply on current situation of Vietnam because of different from management systems, procedures and other factors. Flexible HIA drawn from practical experiences of other countries should be built up to apply HIA successfully in Vietnam.

365. (Paper)

**Ensuring High Quality Environmental Objectives, Targets and Indicators in Strategic Environmental Assessment (SEA)**

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Environmental objectives, targets and indicators are the tools through which the environmental impact of a proposed plan may be assessed and the monitoring system developed for Strategic Environmental Assessment (SEA). Due to their pivotal role in demonstrating environmental impact it is crucial to ensure utmost quality in their development.

Establishing effective environmental indicators, with associated objectives and targets, is an arduous task, but as the SEA Directive (2001/42/EC) centres on demonstrating and monitoring environmental impacts it is important to get it right as early in the process as possible. Here we present a quality assurance checklist for practitioners to ensure compliance with (i) the minimum requirements of the SEA Directive and (ii) guidelines established by the Irish government for SEA of land use development plans. Furthermore, we propose additional recommended tasks to ensure high quality. Some of the questions posed include, 'Can the environmental indicators demonstrate environmental impact, i.e., are they sensitive to change?', 'Is the number of environmental indicators manageable, in terms of time and resources?', 'Will the results of the monitoring programme demonstrate environmental impacts?' and 'Has responsibility for monitoring been determined?' We apply the complete checklist to several environmental reports from Ireland and abroad.

471. (Paper)

**SEA, a Contribution to Sustainable Urban Design - The Approach in Berlin**

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The motive for the presentation is the development of an environmental assessment framework for different kinds of land use plans in Berlin, Germany. The covered area is the metropolitan area of Berlin as a whole. The approach shall be a basis for a strategic discussion of environmental topics of different alternatives of the urban development. It takes into account binding and optional environmental goals as well as the necessity to compare data of different precision and quality.

The current vision is to use this SEA Tools for discussing environmental impacts in urban planning scenarios. The presentation shall discuss generalizable conclusions for possible contributions of SEA to a sustainable urban design and good governance.

Topics:

- General outline on the legal (EU and national) backgrounds of SEA.

- The consideration of the relevant environmental policies and objectives.
- The assesment framework for information processing and decision making, considering the heterogenous databases and quality of environmental informations (Example Berlin).
- Outlook: Using SEA-tools to discuss environmentl impacts of urban development secenarios.
- SEA: A matter of course for sustainable urban design and good governance.

218. (Paper)

**Zoning the Kruger National Park: The 80 Year Blue Sky Scenario**

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In 2006 Kruger National Park, the flagship park of South African National Parks (SANParks) embarked on a project to revise the Management Plan for the park as required by the National Environmental Management Protected Areas Act. SANParks is required to adopt a spatial planning system in all national parks, the Conservation Development Framework (CDF). As a first stage in compiling a comprehensive CDF, the Kruger National Park team revised the zonation plan using the principles of Strategic Environmental Assessment (SEA) as part of the 'package of plan' approach.

The draft Kruger CDF, of which the zonation plan is a part, is a broad spatial plan in which activity and development areas are identified within the broader zonation scheme. The CDF also looks beyond the park's borders, and gives attention to managing the park interface and its land inclusion programme.

The revised zonation plan and draft CDF, it is demonstrated, is far more robust than its predecessors as it was informed by biodiversity, tourism, socio-cultural and regional factors through an integrated and iterative process. This process insured that an eighty year view was taken into the future through a scenario planning approach.

492. (Paper)

**Social Learning for Better Water Management – Insights from the EU HarmoniCOP Project**

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The European Water Framework Directive sets highly ambitious objectives with respect to improving the water quality throughout Europe and requires member states to organize active public involvement in river basin management planning. The EU sponsored HarmoniCOP project sought for ways to

enhance cooperative river basin management through organizing social learning processes. Social learning implies learning by all stakeholders to manage issues in which they have a stake and is based on dialogue and frame reflection. Experiences with public participation in various member states and in numerous case studies resulted in a Handbook for organizers of public participation activities in water management entitled "Learning together to manage together." This paper reports on the main findings of this international comparative research and summarizes the planning approach for participatory activities promoted in this book.

294. (Poster)

**EIA of New Motorways in Croatia: Two Case Studies**

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For the past ten years construction of motorways, especially highways, presents the majority of infrastructure projects in Croatia. Two case studies of environmental impact assessment of planned motorways are presented: (1) motorway Ploče 2 – Ploče which connects Adriatic highway and Port of Ploče, (2) motorway Vučevica - Kaštela which connects Adriatic highway and Split and Kaštela urban area. The general approach of EIA process in Croatia is presented. Application of EIA on these two specific case studies is analyzed. Major impacts and mitigation measures are presented and general problem of necessity of obligatory SEA is underlined.

452. (Paper)

**Determining the Business Value of Corporate-Community Investment: Integrating Operations Management with Impact Assessment**

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This paper will address the question "What constitutes a reasonable investment in community goodwill?" Corporates are still grappling with this subject even though the business case for community investment has been accepted at a general level, as a strategy for competitive differentiation, risk mitigation and a desire to deliver – and to be seen to deliver – a "net benefit" to affected communities. As the CSR debate becomes more refined, stakeholders are scrutinising the content and impact of social programs more rigorously and asking questions about their relevance to the overall impact of companies' operations. Common complaints are that companies give with one hand, while taking away with the other, are inconsistent across business areas, or insincere in their rhetoric about community development. Case studies in the extractive industries will show



how integrated or “soft systems” methods can assist companies assess social investment projects in order to create value for both the company and community, and clarify the boundaries of responsibility at a local operations level. Multi-criteria decision analysis techniques integrating operations research with social impact assessment have proved useful in assisting companies think beyond seeking access to required lands and peaceful relations, to how they can contribute to regional development.

437. (Paper)

**The Promotion of Environmental Assessments concerning Urban Climate and Air Quality in Spatial/Land Use Planning in Seoul, Republic of Korea**

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The rapid economic growth in the Republic of Korea during the last few decades has caused lots of environmental problems including changes of urban climate and air quality. As environmental conservation has become an important issue in the Republic of Korea, the interest in urban climate and air quality has increased, in particular, in Seoul with its densely built-up area.

Despite of increasing interest in both topics, it has not been easy to incorporate these issues in processes of environmental assessments, particularly those related to spatial/land use planning. This is partly due to the lack of the appropriate tools offering spatially-distributed information on climate and air quality based on transparent and commonly accepted evaluation criteria.

In this context, climate analysis maps containing aggregated and evaluated climate and air quality information as well as maps with planning recommendations related to both topics are the necessary groundwork for the application of environmental assessments in spatial/land use planning.

In this context, the paper will focus on a new way of promoting environmental assessments regarding urban climate and air quality in the process of spatial/land use planning in Republic of Korea with the focus on assessment tools and evaluation criteria.

538. (Paper)

**EIA and Then What? – Client and Contractor Responses to Environmental Requirements**

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This paper addresses the issue of EIA in infrastructure planning and its relation to the construction and maintenance phases. The traditional process in Swedish infrastructure planning is usually seen as a straightforward linear process with clear stages such as initial and feasibility studies, design plan, and finally construction. EIA is required in each of these stages. Also, follow-up is usually brought forward as an important step of the EIA process. However, a study of environmental requirements in road maintenance indicates that the requirement in the contracts are based on the knowledge of single individuals and not on a systematic identification of relevant environmental information e.g. EIS, legislation or environmental objectives. Furthermore, the implementation of the requirements is based on interpretations of the requirements, and the execution of the requirements is dependent of the contractors' knowledge, resources, and economy. This indicates that the contracting process determine the environmental effectiveness of a project to the same extent as the EIA process. Also, the studies showed that the EIA and EMP could serve as a base for the environmental requirements in the tender documents. The environmental requirements could thereby be used in the follow-up of the EIA.

185. (Paper)

**A Study on Individual Perceptions of Road Traffic Noise**

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The results of this basic study would be useful in the formulation of noise-related standards, policies, and programs which are more sensitive, relevant, and appropriate to the social concerns, needs and conditions of individuals.

Field measurements of noise levels were undertaken simultaneously with noise perception survey sites in Metro-Manila. The sites were selected in order to obtain data over a wide spectrum of prevailing noise levels.

The topic deals on the Study on Individual Perceptions of Road Traffic Noise. The study filled a research gap by investigating individual perceptions of road traffic noise and their relationship with actual noise levels as measured using sound level meters. It also determined the effects of road traffic noise on individuals such as annoyance, stress, and hearing problems.

Noise generated by traffic is a social and environmental problem that should be addressed by the governments' transportation and highway infrastructure agencies involved in road transport development. The exposure of individuals to road traffic noise can cause health problems; can be very disturbing or annoying to individuals and thus affect their work efficiency and general quality of urban life; and, under certain conditions can also damage physical structures.

Most studies dealing with environmental issues have focused mainly on air pollution. Noise pollution is the least dealt with among the many impacts of road traffic, but there is now a growing concern with this problem. The limited number of studies that have dealt with noise focused mainly on making objective physical measurements of noise levels.

404. (Paper)

#### **EIA: Web-Based Tools for a Participatory Approach**

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EIA and SIA are designed to predict and evaluate the likely environmental and socio-economic consequences of major projects or policies using a pro-active approach and precautionary principles. While reliable data and models to predict impacts are obvious requirements, formal methods to integrate the necessarily subjective elements of perceptions, beliefs, and preferences into a public and participatory impact assessment process are equally necessary. Formal tools to elicit and analyse preference structures for the assessment in terms of criteria, objectives and constraints must ultimately translate qualitative concepts of policy and social sciences into quantitative engineering concepts and numbers.

Based on the experience from several international RTD projects funded by the EU Commission,

involving a number of major cities (addressing problems of urban transportation and air quality) and river basins (assessment of water resources development projects and policies), a set of fully integrated web-based tools for an innovative participatory approach to impact assessment implementing concepts of eGovernment is presented. This combines on-line data bases to describe projects and their environments, institutions, issues, and available instruments, with tools for structured stakeholder involvement including interactive questionnaires together with more traditional workshops. The central tool is a set of integrated simulation and multi-criteria optimization models embedded in a rule-based assessment framework using expert system technology and an adaptive, interactive checklist method.

All tools and data sets are easily accessible on the Internet providing a common, shared information basis and communication infrastructure for an informed and interactive assessment and decision making process. This is designed to give due weight to both the scientific-technical and the socio-political aspects of impact assessment for broad participation and thus ownership, shared responsibility, and acceptance.

401. (Paper)

#### **Assessment of Urban and Industrial Air Quality: A Real-Time Web-Based Approach**

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For the assessment of regional to local air quality a system of coupled, cascading and nested models is being developed in the EUREKA project E!3266 WEBAIR with emphasis on largely automatic real-time operation and a web based implementation. The models are linked to several data bases including real-time monitoring data, emission inventories, and embedded GIS.

The assessment strategies include

- Continuous nowcasting in combination with real-time monitoring for regulatory compliance and project monitoring
- Regular short-term forecasting for one or more days including Internet based public environmental information
- Classical scenario analysis for WHAT-IF questions, including the impact assessment for new or modified emission sources on a long-term (seasonal, annual but at hourly resolution) basis
- Optimization models to minimize impacts within a multi-criteria framework

The simulation tools include dynamic emission modelling, MM5 for meteorological forecasts based on global (GFS) weather forecasting model results, the 3D dynamic code CAMx including PM 10/2.5, and full photochemistry, AERMOD and its pre-processors for conservatives and particulates (local domains), and PBM for dynamic photochemistry (city domains).

A high-resolution convolution model based on AERMOD as a computational kernel with a near-field mixing zone approach is used for the traffic line sources to represent steep local concentration gradients at very high resolution of a few meters but affordable computational demands even with networks of thousands of road segments.

The paper reports on results from a national scale implementation for the Republic of Cyprus, and discusses implementation plans for South Korea starting with GyeongGi Province and the Seoul Metropolitan Area.

647. (Paper)

**Health Impact Assessment Capacity Building in the Mekong Region 2003-2007: Progress and Future Perspectives**

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In support of national poverty reduction strategies, several countries of the Mekong Basin are presently emphasizing steady, fast growth of local economies with resulting heavy investments in new industries and infrastructure development. Most countries have established legislation and administrative mechanisms to address the environmental implications of the many new development programmes and projects. However, the health concerns related to environmental change are often neglected in the compulsory environmental impact assessments (EIA) of such developments.

Responding to expressed needs by Mekong governments for more focus on the health dimension of impact assessments a series of Health Impact Assessment (HIA) capacity building activities have been conducted in the region since 2003 with support from the World Health Organization, DBL-Institute for Health Research and Development, Denmark and InWEnt (Capacity Building International, Germany).

This paper will report on achievements in individual countries in terms of translation of new knowledge and learning on HIA into establishing necessary policy frameworks and institutional support systems for planning and implementation of HIA. Future challenges relate to sustaining the knowledge on HIA in an intersectoral context, to the potential integration of HIA and EIA and and getting overall

acknowledgement and support for HIA by high level decision-makers.

767. (Paper)

**Case Study - Capacity Building on Biodiversity and SEA in South America**

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The International Association for Impact Assessment and the World Bank have carried out a series of training and capacity building efforts on Biodiversity and Strategic Environmental Assessment. Six different training workshops were held covering three basic regions: Central America and the Caribbean, the Southern Cone and the Andean region of South America. A new training methodology was developed, tried out and improved throughout these reunions, which involved a practical and community involving approach. Different real and hypothetical case studies were carried out on SEA for issues and regions which are important for biodiversity conservation within the region. The results from these workshops are presented along with the training methodologies, and the different improvements that were made throughout the different workshops.

320. (Poster)

**Promotion of EA Education for Third Country Audience**

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Under its "Erasmus Mundus" programme, the European Commission is funding a project on the "Promotion of European education on environmental assessment for Third country Audience" (PENTA). A consortium of three institutions, led by University of Technology Bratislava and joined by the University of Liverpool and the Austrian Institute for the Development of Environmental Assessment, aims at enhancing attractiveness of environmental assessment (EA) courses in Europe and attracting third country students to deal with EA issues. PENTA's target groups are higher education institutions from non-EU countries and their academics, students and management staff as well as international academic and students' organisations. The intended main outputs of PENTA are: 1) Development of an EA curriculum, serving as teaching format for universities 2) Elaboration of a handbook on EA for university lecturers 3) Preparation of a textbook on strategic environmental assessment (SEA) for academics and students 4) Elaboration of a library brochure in order to promote European EA education 5) Launching a web site on EA for disseminating the PENTA products, database creation regarding EA education 6) Organisation of two EA seminars for higher education institutions from third countries. PENTA started in October 2005; its duration is two years.

468. (Paper)

#### **The Main Environmental Problems in China's Coal Mine Industry and the Countermeasures**

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Based on the analysis of data in coal mine exploitation fields from 2001-2006, it is pointed out that there are four main problems in coal mine exploitation: 1) the yield of coal is out of control, 2) the distribution lacks regular arrangement, 3) the SEA lags behind the practical needs, 4) the environmental arrangement hasn't covered the whole coal district. In regard to these problems, six countermeasures are brought forward: 1) controlling the total coal yield according to precise prediction, 2) optimizing the exploiting order of coal districts, 3) accelerating the execution of SEA, 4) making migration in coal district more canonical, 5) integrating the small coal mines, 6) installing ecological compensatory mechanism. In order to make environmental governance easier, Based on the analysis of regional ecological situation, geographical characteristics, current exploiting status and future development potential, the concentrating area of coal mine in China can be compartmentalized into three functional zones which

are called optimizing development zone, key development zone and restrictive development zone. Further more, they can be divided into five typical areas. Different countermeasures as well as the kernels in SEA and EIA are brought out to solve different environmental problems in each area.

430. (Paper)

#### **Transport Canada National Environmental Assessment Tracking System: An Integrated Information Management System**

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In 2004 the federal government transferred the Navigable Waters Protection Act from Fisheries and Ocean Canada to Transport Canada (TC). These new departmental responsibilities resulted in a significant increase in workload for TC Environmental Assessment (EA) branch. To ensure adequate information management, the department initiated the development of The National Environmental Assessment Tracking System (NEATS).

The NEATS was planned in multiple development phases that will be implemented over several years. This project was initiated by completing a Feasibility Study to evaluate the different options available and by developing an Interim Tracking System to meet immediate information management needs.

Currently the Phase I NEATS meets the basic departmental needs for EA information management and it is expected that the subsequent development phases will further increase the capacity of the system by integrating with other departmental tracking system (Navigable Waters Protection Program Database) as well as inputting directly into the Canadian Environmental Assessment Registry. The NEATS will be integrated along with other environmental tracking system into an overarching Geographical Information System, currently under development.

Once fully operational, the NEATS will become a core tool for EA practitioners and should improve efficiency of EA operations and information management in the department.

225. (Paper)

#### **An Emphasis on the Need for Systematic Review of the Environmental Impact Assessment Process in Iran**

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Following on from the approval of the first legal  
decree on EIA of development projects in Iran in  
1994, the EIA Guideline, introducing the system of  
preparation and review of EISs was adopted and  
approved by the Environmental Protection Supreme  
Council in 1997. Since then, around 500 EISs have  
been prepared and submitted to the EIA Bureau for  
review.

We have been facing several hindering problems in  
its effectiveness and enforcement. Among others,  
the major issues in this area are lack of explicit legal  
mechanisms for implementation of the guideline,  
slack review procedure and lack of effective auditing  
procedure to control performance of the proposed  
EMSs. Indeed, currently and after about one decade,  
there still is a big question mark on the suitability  
and effectiveness of the EIA system that should be  
answered. This analysis is based on the  
experiences and expertise of the authors and review  
of a number of EISs selected from the archive of the  
EIA Bureau. Suitability and effectiveness of the EIA  
process was analyzed in terms of its inherent  
structural and functional deficiencies as well as  
other external influencing constraints. Finally, some  
comments and recommendations were proposed for  
improvement of the system.

316. (Paper)

**Soil Carbon Inventory Information and its  
Impacts on the Global Environment**

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It has been estimated that the global production of  
food will have to double by the year 2020 in order to  
be able to feed a world population. This leads to the  
large scale clearing of forests for agricultural  
production together with and the intensification of  
land use resulting in land degradation and  
environmental pollution. In order to establish a  
sustainable global land use plan which not only  
provides food security but also environmental quality,  
it is vital that an inventory of land and soil resources  
be available to the land users. This inventory should  
incorporate the current status of soil carbon stocks  
under different land uses and natural ecosystems  
which impact on the emissions of greenhouse gases  
to the atmosphere causing climate change.

Although inventory information on soil and  
vegetation is available in some countries, there is  
little or no inventory information on carbon stocks in  
soils and how these stocks are affected by the  
various land use changes. This paper discusses the  
need of soil carbon inventory information and how  
this information can provide sustainable food  
production and at the same time conserve and  
enhance environmental quality.

728. (Paper)

**Where Economic Regeneration and Human  
Health Collide: A Land Reclamation Scheme  
Incorporating Extraction of Coal by Open Cast  
Methods in South Wales, UK**

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Public health is a feature in many of the strategic  
plans for Wales since powers were devolved from  
the UK government in 1999 and is an important  
priority of Wales: A Better Country which  
emphasises the need to improve social, economic  
and environmental problems in order to achieve a  
sustainable future for its people. Indeed, a focus on  
changing the social determinants of health and on  
reducing health inequalities is evident in Welsh  
policy and health impact assessment is part of the  
Assembly's wider strategy to improve health and  
reduce health inequalities that continue to persist in  
Wales.

By using a case study of a health impact  
assessment of a proposed land reclamation scheme  
which involves the extraction of coal using opencast  
methods, the paper will show how national  
economic benefits and local regeneration can  
conflict with the wider health effects upon local  
communities. The proposal is part of a regeneration  
programme in an area of high socio-economic  
deprivation. However, due to its close proximity to  
local housing and its duration of 22 years, local  
residents are concerned about the effects upon  
communities which already have the highest rate of  
ill-health in Wales.

726. (Paper)

**Community Participation in Health Impact  
Assessment: A Case Study of a Proposed  
Extension to an Open Cast Coal Mine, Wales UK**

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Health impact assessment (HIA) has been on the political agenda in Wales since powers were devolved from the UK government in 1999. In Wales there is greater emphasis on public health than in England or Scotland, with HIA part of the Welsh Assembly's wider strategy to improve health and reduce inequalities. The participation of people and communities in HIA is one of its underlying principles set out in guidelines produced by the Welsh Health Impact Assessment Support Unit in 2004. The Unit therefore encourages organisations to include key stakeholders, including local communities, in the HIA process wherever possible.

The paper will discuss an evaluation of a HIA case study conducted by WHIASU on behalf of local residents who were active participants in assessing the potential impacts upon the communities living in closest proximity to a proposed extension to an opencast coal mine. The HIA presented many challenges due to its political and controversial nature but was able to examine the wider effects on health. The evaluation highlights the benefits of engaging with local communities, the extent to which the HIA influenced the decision to refuse planning permission and how the HIA attempted to work within the existing regulatory framework.

450. (Paper)

**Improving Impact Assessment Methodologies in Transboundary Watercourses: Lessons from Africa and Asia**

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The Environmental Law Institute, University of Tokyo, and UNEP recently completed a three-year effort to develop and test a methodology for assessing the accuracy of transboundary impact assessments for projects affecting international watercourses. The project comprised five case studies in Africa and Asia that compared predicted social and environmental impacts with actual impacts. The case studies yielded several observations regarding how to improve the analytic and procedural methodologies for conducting TIA, and illustrated how factors such as the legal and institutional framework, political context, public involvement, and project design can affect the accuracy of the TIA process.

For example, the various TIA methodologies generally underestimated impacts, sometimes significantly. Environmental mitigation measures often proved more effective than social mitigation measures. Political support for the TIA process can be critical, but political pronouncements about the outcome can be polarizing and counter-productive. Public participation can enhance the accuracy of TIA predictions, and can even trigger the consideration of transboundary impacts in the absence of legal requirements to do so. The case studies also highlighted the need for long-term monitoring. These and other issues illustrate the importance of a more complete understanding about the TIA process and factors affecting its accuracy.

431. (Paper)

**Role of EIA on Decision-Making Process for Hazardous Waste Management Facilities in Mexico**

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In Mexico, EIA is a component of the decision-making process for Hazardous Waste Management Facilities (HWMF). From a rational perspective, the role of EIA during the decision-making process is to provide complete and scientific information, be integrated during the approval process and project cycle, and comply with institutional arrangements. However, it has been suggested that the role of EIA in decision making is not restricted to this perspective only, and others have been advanced by the literature (e.g., pluralist politics). The pluralist politics perspective implies that EIA is inclusive, deliberative, participatory, empowers stakeholders, and makes decisions transparent. Thus, this research investigates the role of EIA on decision-making process for HWMF in Mexico from the rational and pluralist politics perspectives. The research used a case study approach analysing HWMF applications between 2000 and 2006. The data collection methods were documentary review (Environmental Impact Statements, Final Statements, etc.), and semi-structured interviews with key stakeholders during the decision-making processes (developers, consultants, planning authorities, NGO's, and members of the community).

The paper presents relevant research results and discusses whether the role of the Mexican EIA system for HWMF coincides with the rational and pluralist politics perspectives.

136. (Paper)

**Geographic Information Systems in Strategic Environmental Assessment: Can Spatial Data Improve the Process?**

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Land use plans and programmes subject to Strategic Environmental Assessment (SEA) have a strong spatial dimension. In this context, the data display and analysis functions of Geographic Information Systems (GIS) have the potential to facilitate scoping, baseline generation, impact analysis and evaluation, monitoring and public participation processes inherent to SEA.

A GIS-based methodology developed to suit the requirements of the various SEA stages, including a web-based GIS system for public participation, has been applied to development plans in Ireland. The empirical results reveal a number of limitations and opportunities resulting from the use of spatial data. This paper evaluates the reasons behind observed barriers and discusses the unique contribution of GIS to SEA by spatially representing and analysing relevant factors, and facilitating a transparent and replicable process.

765. (Poster)

**"Winds of Change" - A Look at Wind Farm Land Owner Agreements**

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In Canada, provincial governments are seeking a 10-fold increase in installed wind energy generation capacity over the next decade. The popularity of the technology is being fueled by the desire to reduce greenhouse gas and other pollutant emissions, interest in renewable sources of energy, and on-

going improvements in wind generation efficiencies. At the same time, potential health, safety and socio-economic impacts are being recognized globally, especially where wind generation facilities are constructed in close to residential dwellings. Proponents of wind energy facilities may offer attractive long term agreements to landowners in the project area to allow turbine installation, site access, or future development rights. The agreements can provide some financial security for rural land owners coping with diminishing agricultural returns. This poster will consider the issue of long term agreements and how they may impact the short, medium and long-term health and well being of the landowners, their families and their heirs.

778. (Paper)

**The Big Picture View: Using Conceptual Impact Models to Identify, Communicate and Provide Clarity on Important Issues**

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In creating a higher-level awareness of the value of EA, it is critical to provide decision makers and stakeholders with a "big picture" view of key issues of importance in the EA, as well as a sense of how they relate to each other and what kinds of EA can/should be used given the context. To do so effectively, EA practitioners need clarity on the issues, and an understanding of how EA tools can fit in and be effective in distilling and communicating complicated ecological issues. Drawing on experience gained over 25-years of assessing large-scale projects in the energy and other sectors, we will focus on how conceptual impact models (e.g., impact hypothesis or pathways of effect diagrams) can be used with decision makers and stakeholders to guide thinking around the identification of likely impacts and the design of mitigation and monitoring strategies; to focus research; and in adaptive management.

412. (Paper)

**How to Promote Dietary Fiber: From a Simple Message to a Complex Policy**

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The Health Impact Assessment in New Member States and Pre-Accession Countries (HIA-NMAC) project aims to build capacities, assess health impacts of different policies within case studies, discuss place of socio-economic determinants in HIA and implement HIA on local level.

The case studies, targeting different policy areas (wine, dietary fiber, tourism and vulnerable population), aim to provide practical experience on how to conduct HIA and to give guidance on identification of policies to be subjected of HIA. This presentation describes the process of the case study dietary fiber. At the first step we discussed whether a focus on production or consumption policies should be used. Second, we aimed to identify the single policy document which should be the subject of HIA. However, in the special case of dietary fiber a step "zero" should be included to define which raw product(s) dietary fiber consists of.

The HIA methodology has been used including interviews with experts from the field of agriculture and health promotion. A model has been developed to address levels between agriculture policy and health outcome, target population and production chain. This model contributes to identification of the most important policies influencing dietary fiber production and consumption.

609. (Poster)

**Heat-Related Mortality Among the Elderly in Seoul from 1994 to 2003**

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This study analyzed and quantified the effects of extreme heat on summer mortality in Seoul, particularly among the people over 65 years old. The study period was from 1994 to 2003. After controlling the time-trends, relative humidity, and other meteorological variables, we evaluated how the daily mean temperature affects the mortality. We fitted nonparametric smoothing regression models to check the linearity first and then fitted threshold models (combination of two linear models) to estimate the thresholds and the effects. The threshold values in mean temperature lagged by one day were estimated as 28.5°C in 65 years and over population and as 28.9°C in the all-aged population. Estimated percent increases of daily mortality for every degree rise in mean temperature above the threshold were 17% and 16% respectively. It was also estimated that 11% of the deaths among the elderly were related to the extreme temperature in 1994 in Seoul. Considering both rapidly aging population in Korea and greater chance of heat waves due to global warming, comprehensive measures should be adopted to prevent the effects of extreme heat on the people, particularly the elderly.

525. (Paper)

**Application of HyGIS-QUAL2E: A User-Friendly Coupled QUAL2E Model with Korean Hydrological GIS Package, HyGIS**

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It is necessary to offer plenty of spatial information needed for modeling and the constant values that correspond to all sorts of model variables for getting effective results. To satisfy necessities of modeling like above, a coupling method has emerged to link those two technologies, environmental model and GIS. Recently the HyGIS-QUAL2E system was developed in Korea, which is coupled Qual2E model with Korean Hydrological GIS.

The objective of this study is to predict a water quality of streams according to distribution of pollution load in a watershed using the HyGIS-QUAL2E system and to evaluate the HyGIS-QUAL2E system in terms of operating model. As major results, 1) Various water qualities of stream are predicted according to distribution and density of pollution load; also spatial resolutions have an effect on water quality, 2) HyGIS-QUAL2E is a water quality analysis system based on DBMS, using all sorts of the constant values which are necessary for model operating as well as hydro-geometric information being accomplished more smoothly, 3) Using HyGIS-QUAL2E SYSTEM could



draw a conclusion of the modeling easily and support strategies of water quality management.

517. (Paper)

**Soil Contamination in Korean Agricultural Farmlands Being at a Reachable Distance from Heavy Metal Sources**

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This study aims to identify the status of soil contamination in agricultural farmlands located at a reachable distance from a source of heavy metals.

As major sources of heavy metals, metal mine, industrial complex, landfill site, and scrap iron areas are selected and total 154 soil samples are taken from those sources. Soil samples are analysed in terms of 8 analytical categories such as Cd, Cu, As, Hg, Pb, Ni, Zn and Cr+6.

The heavy metal concentrations of the 151 soil samples are lower than the reference value of a soil standard concentration mandated by Korean government among the total 154 samples.

The heavy metal concentrations exceeded the reference value in terms of Cd, Pb, and Cu are 1.802 mg/kg, 109.864 mg/kg and 107.082 mg/kg, respectively. And all these samples are collected from the metal mine sites such as Geopung, Samdong, and Pungsan.

516. (Paper)

**Land Cover Identification of the Riparian Buffers Assigned to Paldang Water Resource Area Using IKONOS Satellite Image**

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Diffused pollution has been considering as a major source of the quality deterioration of water resources. The riparian vegetation strips or buffers along those areas of water bodies is used to reduce the threat of diffused pollution. Remote sensing offers a means by which critical areas could be identified, so that subsequent action toward the establishment of riparian zones can be taken. high-

resolution data from IKONOS satellite are used to characterize the land cover for the study area. Major aspects considered for the evaluation of the feasibility of IKONOS imagery include mapping of tree cover, impervious surface areas, and riparian buffer zone variables.

The purpose of this paper is to analyze land-use condition of existing riparian buffers using spatial analysis technique of Remote sensing, and to discuss about where they are distributed effectively to mitigate the pollution in the riparian buffers.

Through comparing the delineation of land-covers with the existing riparian buffers established by the government, we can find the critical distortion points of the existing riparian buffer zone. Moreover, in a case of the tributary of the water resources more buffers can be needed for reducing the diffused pollution.

522. (Paper)

**Identifying of a Pollution Delivery Coefficient for a Stream Water Quality Analysis Model Introducing a Watershed Form Ratio**

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The performance of a stream water quality analysis model depends upon many factors attributed to the geological characteristics of a watershed as well as the distribution behaviors of pollutant itself on a surface of watershed.

Because the model run has to import the pollution load from the watershed as a boundary condition along an interface between a stream water body and a watershed, it has been used to introduce a pollution delivery coefficient to behalf of the boundary condition of load importation.

Although a nonlinear regression model (NRM) was developed to cope with the limitation of a conventional empirical way, it can't be applied to where the pollution load washed off (assumed at a source) is less than that delivered (observed) in a stream.

The objective of this study is to identify what the reason causes the limitation of NRM and suggest how we can purify the process to evaluate a pollution delivery coefficient using many field observed cases. As a major result, it was found what causes the pollution load delivered becomes bigger than that assumed at the source. In addition, the pollution load discharged to the a stream water

body from a watershed was calculated more accurately.

539. (Paper)

**Water Quality Simulation for Optimum Hydraulic Situation in Daechong Reservoir**

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This study aims to analyze the water quality effect on the geometric information and the gate flow control in Daechong Dam Reservoir. This study consists of the third step. First, the segments have process of optimized size using the optimal section auto-creation program. The optimal section auto-creation program used to easily acquire geometric information for CE-QUAL-W2. It has definitely the critical number and size of segments. Second, it has been control the gate flow and spillway flow in order to research the simulation of the water quality. Third, it has been simulated the water quality under the optimized hydraulic situation. As a major result, it was found what optimized size the segments consists of bathymetry file for CE-QUAL-W2. In addition, hydraulic condition simulated to water quality was calculated more accurately.

117. (Paper)

**Challenges of Public Disclosure of Social and Environmental Issues at the Local Level in Nigeria**

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A key component in social and environmental impact assessment process is disclosure of information on potential impacts to all stakeholders. Being stakeholders, all project-affected folks must be aware of the potential impacts of a project that is likely to affect their well-being. Public disclosure of information in Nigeria, a nation characterized by complex plurality in religion, ethnicity and socio-economic circumstances, is marred by several challenges. These challenges are centered on ignorance, illiteracy, poverty, insecurity, cynicism, insincerity, etc., which often crystallized into social conflicts/violence. This paper uses case studies from the Niger delta and northern regions of Nigeria, to discuss challenges facing the disclosure of social and environmental issues at the local level. The paper also highlights the approaches employed to

overcome the challenges, and their suitability to similar circumstances.

116. (Paper)

**Economic Development versus Social and Environmental Sustainability: A Cursory Look at Obajana Cement Project in Nigeria**

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Nigeria imports 80% of its cement, despite local availability of raw materials to produce cement; hence an indigenous firm proposes to implement a greenfield cement project (the largest in Africa) to boost local production. With a production capacity of 4.4 million metric tonnes of cement per annum, the Obajana Cement project includes a production plant, a captive gas power plant (with accessory 92km gas pipeline), limestone quarry (with associated crusher and 7.5km aerial conveyor belt), 13m high earth dam, 328-unit housing complex, and a 2,000-capacity trucking park. When fully operational the project is expected to curtail import by 60%, sparing >US\$500 of Nigeria's foreign reserve annually. The project is sited in a rural guinea savannah, populated largely by illiterate and poor people, who depend on their physical environment for their livelihoods. The project-affected communities are devoid of basic amenities such as electricity, potable water supply, hospital, telephone connection, etc. In order to balance economic development with social and environmental sustainability, four impact assessment studies were carried out. This paper discusses the social and environmental challenges facing the project, highlight measures for mitigating/ameliorating them, and lessons learnt during the EIA process.

500. (Paper)

**Environmental Risk Assessment of High-Sulfur Gas Field Development in Complex Terrain**

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Environmental risk of high-sulfur gas field becomes the focus of environmental management studies. Severe gas H<sub>2</sub>S blowout accidents in recent years have shown that poor understanding and estimates of the poisonous gas movement could lead to dangerous evacuation delays. Traditional expired models are not valid where the terrain is not smooth

and especially in low-lying areas where the gas accumulates. As a case study of "Pu Guang gas field" in Sichuan Province, terrain following coordinate three-dimensional objective wind field diagnosis mode, Lagrangian Puff Model, breaking up technique of puffs are used to simulate transportation and diffusion of H<sub>2</sub>S. The result shows that the main damage of H<sub>2</sub>S does not occur on the leeward region. The concentration bands of H<sub>2</sub>S bend with the landform, and distribute discontinuously as a result of puffs flowing around and getting across the mountain. Comparing the evaluating results of the blowout gas well on different evaluation reveals that the higher is the elevation, the transportation and diffusion condition of air contaminations would be better. In the end it suggests that the gas well should be allocated at high elevation which has less environmental risk than low elevation.

454. (Poster)

**Study on the Eco-Compensation of Oil Resource Exploitation**

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Petroleum is second to coal among the energy sources in China. Nowadays, over-exploration of petroleum resources has resulted in an excess of environment load and continual deterioration of ecological environment. Therefore, it is imminent to establish perfect and effective ecological compensation mechanisms for energy and resource exploration such as petroleum. In this paper, taking the 7th area of Tahe Oil Field for example, we analyze environmental pollution and ecological impacts, then base those findings according to actual eco-compensation mechanism in some countries and discuss the establishment of eco-compensation mechanisms in this oil field and ascertain the principle, the standard, capital source and the content of eco-compensation. By accounting for the cost of environmental pollution and ecological deterioration, we worked out that the loss is 341.22×10<sup>4</sup> yuan and the ecological compensation standard is 0.85 percent of the sales value of petroleum in 2005.

558. (Paper)

**Economic Cost-Benefit Analysis of Environmental Impact of Hydropower Development Projects: A Case Study in the Upper Reaches of the Xiu River, China**

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The impact of a hydropower project can be both positive and negative, and the theories and methods of environmental impact assessment are still worldwide problems at present. Except for the main objective of hydropower project, which was electricity generation in this study, it also had environmental benefits in flood control, agricultural irrigation, water supply and aquatic production. However, the construction of the hydropower project also had negative impact, caused emigrant problem, blocked shipping, destroyed the living environment of terraneous and aquatic animals and broke up the regional landscape. This paper applied economic theory on hydropower project, took both the positive and negative factors into consideration, and analyzed the economic cost and benefit of environmental impact of hydropower to evaluate long term impact and the profit of hydropower project.

772. (Paper)

**Utilized Methods of Comparing Alternatives in Environmental Impact Assessment in Japan**

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Though alternative analysis should be the key of EIA, it has been not well conducted in Japan. By the establishment of the national level EIA Act of 1997 applied to major construction projects, the concept of alternatives analysis was introduced. It has been implemented gradually since the full implementation

of the Act in 1999. It has been influencing the implementation of local level EIA. The paper conducted a survey to clarify the state of the art of the methods utilized for comparing alternatives. Although the proportion of the cases which conducted alternatives comparison is still low, i.e., around 10%, the authors could observe the current situation of the usage of the method. The paper illustrates the results and gives some future perspectives of the topic in Japan.

578. (Paper)

**Recent Movement of Strategic Environmental Assessment in Japan**

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SEA systems in Japan have been developed in some advanced local governments such as Saitama Prefecture, Tokyo Metropolis, and Kawasaki City. We have not got national level SEA system at this moment yet, except in the field of international activities, which is that of the Japan International Cooperation Agency. The Japanese government started to make a study for introducing SEA on the national level in 1998. Though it has passed nearly ten years, the government still does not have a system on the national level yet. But the situation has been changing from last year. The Ministry of the Environment has been negotiating with leading authorities of big projects through utilizing the discussions at the study committee. It has become to be expected to introduce an SEA system at plan or program levels. The committee is planning to issue the final report at the end of March 2007, then the Ministry should make an administrative SEA guideline after April. The author will illustrate the current situation of preparation of the guideline, the structure of it and the future perspectives.

586. (Paper)

**Cumulative Effects Considerations in Strategic Environmental Assessment**

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Regional economic growth must take into account conservation and sustainability considerations. Within this development context, there is a need to investigate conceptual and practical means to build cumulative effects considerations into strategic level assessment. Building on recent research that characterizes a spectrum of strategic and non-

strategic approaches to CEA (Harriman and Noble 2006), this paper evaluates whether existing strategic frameworks are adequately developed to address cumulative effects, and suggests further options to define and assess cumulative effects in a strategic context. The discussion is based on a review of recent literature and the results of interviews with internationally renowned academics and a range of SEA practitioners with experience in regional oil and gas development in northern Alberta, Canada. The result is a conceptual framework that explicitly accounts for the consideration of cumulative effects at a strategic level of assessment.

356. (Paper)

**Developing Sound Environmental City Center by Strategic Environmental Decision Making Approach in a Tokyo Business Center**

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Introducing sound environmental technology in a building is one method to develop a sound environmental city. Environmental measures applicable to a business building area are limited to mutual utilization of energy between neighbor buildings etc., as well as the application of SEA to an urban development plan. Usually there is almost no area-wide decision making system because hundreds of private stakeholders related to the area do not have common target for a future business plan as well as an environmental management plan. It is difficult to implement SEA in a business area level.

Marunouchi area, which occupies 120 ha in central Tokyo, is the economic center of Japan and well-known private companies place their head offices in this area. A stakeholder committee composed of concerned private companies has decided to start to develop strategic environmental management scheme in the area by employing development of an environmental future vision and environmental friendly measure's road-map as well as developing partly real-time environmental monitoring system for energy, temperature, wind, waste generation, etc. It is a new approach to develop environmentally friendly decision making in the Tokyo city center. Recent activities will be presented in this presentation.

773. (Paper)

**Occupational Health and Safety Management Systems - Organisational Approach Towards Implementation**

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The paper discusses organisational approaches towards implementation of OHSAS 18001, but the findings are relevant for the implementation of ISO 14001 for environmental management systems.

The aim of this paper is to analyse two different teaching programmes and progress regarding implementation of OHSAS 18001 in SMEs. The analysis takes point of departure in three approaches to organisational understanding: organisations as technical, socio cultural and network based systems. The organisational approaches of the two cases are analysed with the purpose of assessing the relationship between the chosen organisational approach and the concrete results of the projects. Both cases include the technical/rational element. The paper concludes that the case with most focus on socio cultural elements secures that learning processes take place in the participating companies in a better way and a better insistence in these companies in the teaching programme. The network oriented element is important to secure further progress of preventive H&S activities in the SMEs after the teaching period is finished. In one case, the companies were members of a Green Network of local companies and authorities who arrange meetings about environment and H&S issues during the year. Besides the companies can become certified according to a H&S manual made by Green Network. These initiatives help securing continuous improvements of health and safety in the participating companies.

278. (Paper)

**EIA and Direct Democracy – Challenges for Top-Down Participation**

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Public participation is a fundamental part of EIA worldwide. Beside the environmental goals one central objective of EIA is to increase the participation of citizens and other stakeholders of civil society. From the viewpoint of direct democracy, EIA represents a modern and collaborative policy instrument.

Even if EIA obviously contributes direct democracy in certain planning processes, it is in the first place an institutional, formal and top-down instrument. As a forum of public participation and interaction, EIA is a creation of public administration framed and defined by legislation. The implementation of participation is more or less top-down formulated. EIA creates asymmetric power constructions. For example, the role of the developer is dominant with relation to citizens concerning the agenda framing, etc.

EIA is always connected to power and has its political dimension. In addition, values and interests steer all the actors in EIA. There is a tension between the legislative objectives and goals of actors. This paper approaches these challenges for direct democracy. Can EIA offer an open, equal and interactive participation opportunity for all actors? Is it possible to guarantee the effectiveness of public participation even if the EIA processes are mainly carried out by developers?

763. (Paper)

**The Impact Assessment of High Wind in Youngdong Region**

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The aim of this study is to evaluate the characteristics and impacts of high wind for the period of 1988-2006 (except typhoon) in Youngdong Region of South Korea. The high wind occurred more frequently and the impacts have been increased recently.

Two case studies for October 21-24, 2005, and October 22-24, 2006, have been accomplished to assess the impacts of high wind. The economic cost of high wind disaster in October 2005 amounted to \$7,700,000: that is equivalent to 31% of natural disaster damages of this region and 78% of the national high wind property damages. The maximum instantaneous wind velocity was 63.7m/s, and it damaged fishing industry at a heavy cost along seashore cities on 2006. It reached \$55,000,000. The collapse of breakwaters, roads and power lines caused reduction in the tourism and crop yield. Some victims of calamity experienced PTSD (Post Traumatic Stress Disorder).

New techniques, such as remote sensing, GIS DB and computer models should be introduced to mitigate the impacts of climate disasters including high wind and to develop the monitoring, early warning, control and recovery system.

292. (Paper)

**Social Impact Assessment of Technology Use for Good Governance in Bangladesh: Prospect of Learning from the Newly Industrialized Asian Economies**

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With a very low corruption perception index, Bangladesh has been termed as one of the most corrupt nations of the world. In comparison to the Newly Industrialized Economies (NIEs) in Asia, Bangladesh lags behind in terms of both economic and governance indicators. The direct link between economic performance and good governance has prompted the NIEs to search for all means to improve governance scenario where the use of technology has got the highest attention. The comparable development status of Bangladesh and NIEs in the past warrants exploring the strategies and achievements of NIEs with a view to improve governance scenario in Bangladesh to register higher economic growth. Despite the lack of adequate technological means in Bangladesh, there is a prospect to learn from the NIEs which have adopted simpler models of technology use for good governance. With a demonstration of how technology has influenced the society in Bangladesh hitherto, this learning process can explain to and guide the policymakers in Bangladesh how the similar use for good governance will create an impact on their society like the NIEs. This paper attempts to critically demonstrate how this learning process could be facilitated to have an efficient governance structure in Bangladesh.

124. (Paper)

**Sustainability Assessment of Poverty Reduction Strategy Papers**

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Poverty Reduction Strategy Papers (PRSPs) are currently a central instrument in international development cooperation. A checklist of 85 questions has been developed at the Human Ecology Department of the Free University of Brussels to analyse the inclusion of key aspects of sustainable development in PRSPs. The checklist allows to point to sustainability challenges and opportunities and thus facilitates targeted advice and quality improvements. This policy-supporting instrument can also be used in a full strategic environmental assessment or elaborated sustainability assessment of a PRSP.

The checklist was applied to a selection of 12 PRSPs of developing countries. The results of the

sustainability assessment reveal an insufficient integration of the ecosystem services concept, of biodiversity and of climate issues. Property rights, gender issues, water and energy are as a rule well elaborated.

PRSPs show significant variation in the integration of environmental sustainability issues. The detailed results will be presented at the conference.

It appears that sustainability assessments can contribute to significant improvements between first and second generation PRSPs when the assessments are supported by a strong institutional framework and when a dedicated political commitment towards sustainability is present. This tool has certainly its role to play in fostering good environmental governance in the developing countries.

145. (Paper)

**Applying Participatory Health Impact Assessment for Advocating Development of Healthy Public Policy in Thai Local Government Planning Processes**

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Since 1999, Thailand has legitimately decentralized implementation of public policy planning development to the local administrative levels. Consequently, many new local governments, mostly sub-district administrative organizations (SAOs), have been established to manage development activities.

Research has been conducted at Bueng Nium SAO, Khon Kaen province, since June 2006 (i) by applying a participatory HIA tool for assessing an existing 3-year SAO rolling development plan, and (ii) by creating participatory recommendations for building healthy public policy and planning frameworks for future SAO development plans.

A process of firstly, HIA screening of the current development plan and activities, and establishing an HIA steering committee; secondly, scoping by the steering committee setting the criteria for assessment of the selected plan and activities; thirdly, applying such criteria by stakeholders assessing the chosen plan, and generating recommendations for future improvement of the existing rolling plan. Next, the HIA report will be

appraised participatorily, and the final HIA document used as a guiding principles for the next planning process.

Preliminary results indicate that the introduction of the new participatory HIA makes the local stakeholders better understand sustainable community well-being, and it helps identifying current SAO development planning that needs to be adjusted accordingly.

143. (Paper)

**Public Participation in EA on Community Water Resource Development Project**

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This study was funded by the IUCN-Mekong Wetland Program 2006. The initiative using participatory environmental assessment (Par-EA) made here was viewed as very new and being the first attempt of the Thai EA practice, while encouraging active community groups involvement within the EA process and eventually much contributing to good governance outcome on balancing water resource development versus ecological conservation value.

Ban Don Daeng is a small community located in Songkram watershed northeast Thailand. Local villagers often experience seasonal flooding which causes severe damages to rice crops during the wet season. The local government proposed to build the dike on an existing natural reservoir Nong Chai Wan, while expecting to increase the water volume supplied for dry-season rice growing. The Nong Chai Wan is well perceived as a unique wetland habitat for native flora and fauna, and thus the IUCN-Mekong Wetland Program selected to be the site of prime conservation. Much debate and conflict sprang up for almost three years regarding the impact of dike construction at Nong Chai Wan between community conservation groups, local government and local dry-season rice growers. This study used participatory environmental assessment (Par-EA) aimed to explore any solution to the

conflict case, while engaged all key stakeholders participating throughout the EA process. This study suggests that the Par-EA can eventually effectively build an insightful information exchange on livelihood and ecological conservation values between different stakeholder groups and finally reaching the best agreed option, other than the proposed one, with least ecological value impact.

340. (Poster)

**Gostima SHPP**

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The main task of designing is the completion of technical designing for construction of Gostima small HPP. A second task after the completion of the first task is the assesment of its impact on the environment and the ways to minimize this impact.

Based on the the Law no. 8990, "On environmental impact assessment" it may be concluded that the project for construction of Gostima small HPP should be subject of simple (not in-depth) environmental impact assessment due to minimal envrionment impacts since we are going to deal with very minimal emissions in atmosphere, soil and water, particularly during HPP operation phase.

The conclusion is that, in case of construction of Gostima HPP, the greehouse gas emission will be reduced at the national level. This is a very important conclusion because this HPP may be used for selling emissions of various countries, which are subject to meeting greenhouse gas emissions targets under the Kyoto Protocol. Purchasing of these emissions using Clean Development Mechanism (CDM) of Kyoto Protocol will make possible provision of various grants to cover a part of first investment for construction of Gostima HPP.

687. (Paper)

**Multi-Stage Environmental Impact Assessment on Processing for Toxic Wastes Abandoned Illegally**

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In spite of strengthening of the regulation on waste treatment in Japan, toxic wastes are often abandoned illegally. This kind of waste pollutes groundwater. It creates worry about neighboring residents' health impairment. A processing enterprise had to be founded by public intervention. The kind of enterprise has to consider residents'

health, environmental preservation and public participation. The multi-stage environmental assessment on the processing plan was introduced by the local government. First, the body had examined which was the better option on-site or off-site. This decision making stage is called "policy assessment." The body and the local government had decided in-the-city to be an examination area. This stage of the assessment is called "acceptability assessment." They are made up some kinds of alternatives and had assessed whether the point would be a suitable site or not. This stage is called "capability assessment." The master plan has been made up and assessed as an "environmental impact assessment." The plan raised accuracy and the body is continuing environmental researches and making the monitoring plan.

417. (Paper)

**The Quality of Environmental Impact Statements of Waste Incineration Projects in Finland**

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The quality of an Environmental Impact Statement (EIS) is the key issue concerning the effectiveness of EIA. In Finland the quality control is the task of the Regional Environment Centers which act as competent authorities in the EIA processes. In this paper a total of 15 Environmental Impact Statements of Finnish waste incineration projects were reviewed using European Commission's guidance on EIS review. All the EISs were found adequate by the coordinating authorities in 2001-2005. The result of the review was that the statements were found satisfactory though many improvements could be required. The six review areas were 1) description of the project, 2) description of the environment, 3) description of the effects of the project, 4) mitigation measures and follow-up, 5) presentational issues and 6) non-technical summary. The statements performed best on the review areas "description of the environment" and "the presentational issues." The weakest result was gained in the area of "mitigation measures and follow-up."

559. (Poster)

**Assessment of Air Pollution Emission Control Strategy using Linear Programming Technique**

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The air pollution level in Seoul metropolitan area marks 1.7 - 3.5 times higher than the pollution levels in other major cities. To cope with this serious problem, the Korean government legislated the Special Act on Metropolitan Air Quality Improvement in December 2003. One of the major measures of this act is total air pollution emission management system. To make new system work efficiently, the assessment of the priority on air pollution control strategies is necessary. The NOx concentrations affected from emission source categories are estimated by air quality modeling. The emission reduction rates of source categories to minimize the total emission are calculated by linear programming technique. The solution of this linear programming means the best strategy to meet the target air quality considering the air pollution emission and culpabilities from source categories. As a result of this study, it was shown that the priority of control of mobile sources; especially heavy duty vehicles is higher than the control of other sources.

562. (Paper)

**Mountains-Scale Forest Fragmentation Delineation using Multi-Temporal Trends in Remote Sensing-Derived Land Cover Classification**

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The SLOSS debate was a debate in ecology and conservation biology as to whether a Single Large or Several reserves was a superior means of conserving biodiversity in a fragmented habitat. Jared Diamond suggested 6 rules for the design of protected areas, based on MacArthur and Wilson's Theory of Island Biogeography. The rules could be applied to the fragmentation of forests as habitats.

The objective of this study was to use multiple satellite remote sensing datasets to delineate land cover, including forest patches, for the Geum-buk mountains at the north of the Geum river. Landsat visible and near-infrared satellite images obtained at multiple dates in the growing season were used to create a forest distribution map. Fragstats was used to get the landscape indices delineating the



Diamond's 6 rules in the forest fragmentation. Additional ground truth data was used to assess the accuracy of the procedure and to show the land-cover condition of the spots where a forest was fragmented. The results of this study showed that the landscape indices explained the Diamond's 6 rules very well and the forest fragmentation will be useful as input data to the forest habitat conservation model.

605. (Poster)

**Concepts and Case Studies of National Environmental Assessment Map in Korea**

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Korea has basically managed national lands through the zoning system from the year of 1934. But it is insufficient in environment conservation and managing conflict between development and conservation. So, in this paper, we describe the process and case study of mapping national environmental value assessment. This map is based on valuation of 67 items. Of those, 56 items are related to the area for preservation designated by law such as green belt etc., 11 items to ecological information such as biodiversity, forest etc. We value each item environmentally from 1 to 5 grade, and then overlay 67 maps, and decide the smallest as a site's final grade. As a result, we divide the national lands with five grades according to conservation values in scaling of 1:25000. This map can be widely used at urban and regional plan, development plan and environment impact assessment, etc. This map is open to all Korean people through the Internet.

400. (Paper)

**The Ranges of Magnetic Fields in High-Voltage Transmission Lines for Evaluation of Environmental Impact**

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Recently, concerns about health risks exposed to electromagnetic fields have been brought in the safety of electric power lines. They are based on the epidemiological study suggesting association between childhood leukemia and long-term exposure to electromagnetic fields from high-voltage transmission lines. A number of governmental and international organizations have advised people in residential area to avoid the magnetic field exposure as precaution.

In this study, the principles, ranges and assessment methods for power-frequency electromagnetic fields were reviewed from the relevant research papers and documents.

The ranges of electromagnetic fields were determined from 50m to 100m and have been defined according to the properties of each electric power lines and a new methodology was suggested in this study.

501. (Poster)

**HIA in National Health Act, B.C. 2550, Thailand**

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The National Health Act is the law that all sectors are invited to take part in the drafting. It provides the philosophical concepts, mechanisms for steering the

health system and explains the definition of health system as a management of all related matter of health in the way of living. This legal document is the first law containing the issue of HIA for prescribing rules and procedure on following up and assessment in respect of national health system and the impact on health resulting from public policies, both in the level of policy making and implementation. The declaration of this Act intends to use HIA as the process and the participatory learning tool for development and initiation of public policies. This process, finally, will be implemented for the right and health of Thai people.

645. (Paper)

**Supporting South Africa's Economic Development Through the Evaluation and Improvement of Environmental Assessment Tools**

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In South Africa, sustained economic and social development is critical. The principle tool for developmental environmental assessment, EIA, has developed a reputation for constraint. We summarise a research programme aimed at quantifying constraints and problems associated with EIAs and establishing frameworks for the development of analytical tools for more efficient, defensible and justifiable environmental decisions. Initial work indicates that one of the principle problems with EIAs is the duration of study and their ability to accurately predict complex, multifaceted and non-linear impacts across different scales. The use of established decision making and strategic tools such as multi-criteria decision analysis, could improve the efficacy, integrity and public trust of decision making. While the ultimate recommendations of this in-progress research programme may turn out to be, *inter alia*, reconfiguration of environmental assessment and decision making, interim observations suggest that supportive conceptual injections (e.g., systems theory) into EIA processes may be beneficial. These, and other examples, are analysed through the lens of contemporary South African environmental administration and the programme's initial and anticipated outputs discussed. The paper ends with summaries of potential research directions, outcomes and lessons for developing countries grappling with reconciling environmental assessment, growth, conservation and responsibility.

314. (Poster)

**For an Effective Follow-up Process in Korean EIA**

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The follow-up process in the Korean EIA system consists of two steps. First, it monitors whether project proponents comply with reviews made by KEI (the environmental agency reviewing EIA reports). The second steps is to survey environmental impacts during and after implementation of the proposed action. The follow-up requires the proper participation of stakeholders: project proponents, compliance monitors, impact monitors, and environmental agencies approving and reviewing said projects. Currently, follow-up process does not work well in Korea because each stakeholder does not play his proper role for various reasons such as mutual distrust among stakeholders and problems associated with institutional settings.

This study intends to improve effectiveness of follow-up process and, ultimately, to improve quality of EIA by devising a follow-up system that delineates clear roles and build a strong network among stakeholders. In order to do so, the study identifies current problems associated with follow-up process and examines basic concepts and procedures involved in it. Secondly, it analyzes relational dynamics among stakeholders to identify what's behind the current mutual distrust. Third, it proposes a way to delineate clear roles to each stakeholder so that follow-up process runs efficient as an organic network.

769. (Paper)

**Energy and Environment, Examples of Power Generation in Korea**

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Energy resources connected directly to people's lives are important elements and essential in

industry activity. Energy demand in Korea has been growing more than twice every 10 years according to growth of economy and improvement of living standard. Recently, advanced countries are leading to establishing and enforcing internationally unified regulations of various forms such as the Montreal protocol and the Climatic Change Convention to maintain the natural environment of the earth. Our country is urgently needed to search for future new energy sources. Therefore, with the focus on power industry that is depending on importing the bulk of fuel, I examine the possibility of developing alternative energy and our country's actual condition of use of energy, grope new direction of sustainable development.

Until now the main environmental problems of the power plant have been caused by air pollutants like SO<sub>x</sub>, NO<sub>x</sub>, and CO<sub>2</sub> emitted by firing of fossil fuels and the power plants have minimized their emission by installing very efficient equipment for reducing air pollutants. As you know, the current issue is CO<sub>2</sub> which is one of the greenhouse gases, so we have to find out ways to reduce CO<sub>2</sub>.

503. (Poster)

**Establishment of an Assessment System for Environment-friendly Performance of Residential Land Development Project**

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Residential Land Development Project is defined as "an action to create value-added on land for public infrastructures and housing construction according to Residential Site Development Promotion Act," and it is an essential factor for providing a residential foundation and a convenient life. In contrast to its positive impacts, it can have considerably negative impacts on environment. Economic factors decided construction projects in the past. However, these days, environmental factors can't be ignored as consciousness on environment has been emerged in domestic and global society.

This study will establish an assessment system for promoting the environment-friendly performance of Residential Land Development Project by analysing review opinions of the previous Environmental Impact Assessment. The assessment system will contribute to minimize the impact that the development projects implies on environment.

736. (Paper)

**Development of Prior Environmental Review Support System in Korea**

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In Korea, the Prior Environmental Review System (PERS) was adopted in 1993, which aims to balance development and preservation by identifying possible environmental impacts of development plans or projects in the early stages of planning.

To enhance the efficiency of PERS processes and accessibility of information about Prior Environmental Review statements, KEI (Korea Environment Institute) consortium developed a web-based environmental information and decision support system, which named the Prior Environmental Review Support System (PERSS).

PERSS contains more than 9000 past Prior Environmental Review text data including 200 full text statements and more than 500 project site GIS data.

The Online WEB-GIS of PERSS is linked to Environmental Assessment Map of Korea and Environmental Impact Assessment Support System (EIASS) to search environmental constraint factor of project; thus developers can check out land use suitability by themselves and easily identify an environmental constraint factors, which support developer's decision-making and contribute to shortening the whole development process.

It is possible that developer consults with a responsible official on land use suitability by online application process.

PERSS would be also a stepstone of cumulative Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA).

399. (Paper)

**The Effectiveness of Social Variables in Social Impact Assessment: The Korean Case**

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The purpose of this study is to examine effectiveness of social variables identified in the "US Principles and Guidelines for SIA" (USPGS, 1994) and to develop the efficient process of social impact assessment in selecting social variables. In order to do this, the study probes recent cases in Korea where social conflicts over development projects—among developers, governments, local communities, and environmentalists—have been quite serious. Methodologically, the study selects four different typical EIA cases, applies social variables identified in the USPGS to Korean cases and employs 'scoping' to sort out which social variable proves effective or not in Korean cases and different project types. The comparative analysis between Korea and US, thus, sheds light on both universality and specificity of certain social variables in local contexts and different project types. It dictates that both decision-makers and practitioners need to consider local contexts and project types when applying social variables in implementing policies. Ultimately, the authors hope, the study will contribute to making social variables in specific and social impact assessment in general rich in theory and practice.

332. (Paper)

**Emission Status of Air Pollutants for the Compliance of Climate Change**

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As a signatory to the Kyoto Protocol, the Korean government has been able to drag its feet on reducing greenhouse gas emissions. Even Korea was classified as a developing country, meaning it has no reduction requirement on GHG, however provincial government has tried to comply with global regime such as UNFCCC of its own accord.

Chungnam has been shifted from agricultural to industrial stage rapidly by pursuing dynamic regional

economic growth policy. So it has been functioned as a thermal electric supplier for whole nation, and settled down as a petrochemical and refinery depot, steel and semiconductor manufacturing complexes as well.

In comparison of the GRDP by capita, it was 9% higher in 1995 but 42% in 2005 compared to the nationwide level. The growth and extension of GRDP owes too much to the exertions of this industrial policy.

We studied the emission status of air pollutants and GHG in Chungnam Province by the section, such as electricity, transportation, manufacturing industry, household and public services. On the grounds of these emission status analyses, we can concentrate on efficient measure of reduction for the compliance of climate change regimes.

560. (Poster)

**Analysis and Prediction of Water Quality Variation in Flow Line of Gwangju Stream**

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In this study, the characteristic of water quality variation in flow line of Gwangju stream is analyzed, and its water quality is predicted for different counterplans by using the QUALKO model.

The flow Gwangju stream in the evening is more than morning and afternoon, and the flow tends to be increased from upstream to midstream, but decreased from midstream to downstream.

The water quality of Gwangju stream worsens as water runs from upstream to downstream. This

result indicates that sewage is inflowed according to flow line. The source of the sewage inflowed in Gwangju stream is the traditional shopping districts located and crowded in both sides of the middle and upper stream, but in the downstream, it results from house district, specially Sang-mu district.

The modelling results show that the water quality of Gwangju stream is seriously influenced by the water quality of stream maintenance water and also the yes or no of sewage pipeline consolidation. In addition, the most appropriate alternative for improving the water quality of the stream is to perform the consolidation of sewage pipelines located in the both banks of Gwangju stream.

331. (Paper)

#### **Application of SEA in the Process of Chungnam Provincial Planning**

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SEA in Korea has been applied in administrative planning for the purpose of enhancing environmental concerns and gearing up sustainability under the amended Framework Act on Environmental Policy on and after 1 June 2006. The 3rd amended Chungnam Provincial Planning was schemed in November 2005 on the basis of National Territorial Basic Act; therefore, it is not necessarily applied that SEA system as a legal compulsory measure, but as a subject of planning and institute for leading organization, we determined to promote and implement SEA in regional planning process. We set up basic principles in the process of implementing SEA, and mainly focused on the context of guidance, practicability and consistency in relation to the attribute of the plan.

The development of the SEA process in provincial planning raises many integration challenges. The main issue relates to the extent to which SEA should be integrated into the planning process. As a suggested model for SEA application, we tried the concurrent complementary feedback model, which is based on the integration of the SEA process into the various stages of the each sectional plan-making process in an iterative manner as an adjusting assessment.

445. (Paper)

#### **SERPENT Project: Industry and Academia Join Forces to Improve Impact Management in the Deep Sea**

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Our increasing demand for energy places a considerable strain on the environment. This is particularly true offshore where the industry is rapidly expanding its exploration and extraction activity into the deep sea. The industry is committed to minimising operational impacts but the ecology of the deep sea is still poorly known. There is a clear need to improve our understanding of how these systems respond to and recover from disturbance and other impacts.

The SERPENT project is an academic research programme that allows scientists and industry partners to address these challenges. At the heart of the project is the concept that industry partners can advance our science by making cutting edge Remotely Operated Vehicle (submersible) technology and existing data more accessible to the world's science community. This enables scientists to conduct *in situ* investigations of how deep-sea systems are affected by operational impacts and help in developing appropriate practises and technologies that can protect and preserve these ecosystems.

This research is closely coupled with outreach activities. The striking footage of deep-sea organisms obtained from little-known environments have not only captured the interest of the media and general public but also provide useful material for educational purposes.

655. (Paper)

#### **Compensation Integrated into Infrastructure Planning and EIA in Finland, Case: Europe E18 Motorway Turku-Vaalimaa**

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In Finland compensation plays no official role in infrastructure planning, unlike in many other European countries. Compensations are traditionally seen as the last possible means to mitigate harmful environmental impacts. Today there has been increasing discussions around compensation in Finland. We need to take a fresh look at compensations as a whole, not only ecological, but also social, and through land use planning. The aim is to find new methods that can be integrated into EIA and Finnish planning processes. An ongoing non-academic research funded by the Finnish Ministry of the Environment and Ministry of Transport and Communications analyses example projects from Finland, Sweden and Germany to find

out which compensation measures could be adapted into Finnish EIA. The Finnish case is Europe E18 Motorway Turku-Vaalimaa, where the planning process has been ongoing since the 1960s. The case study includes several EIA-processes from the 1990s until today.

396. (Paper)

**Post-Project Review on Resettlement Scheme Applied for a Dam Construction Project in Indonesia**

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The resettlement scheme of the Kotapanjang Dam, built in the 1990s in the Sumatra Island of Indonesia, has been criticized by environmentally concerned groups. The project is believed to have created many problems for resettled families. The survey carried out by the authors suggests that living conditions of two villages have been significantly improved after resettlement. The condition of another village has been fairly improved although there is room for further improvement. In yet another village, while many people experienced income decrease and hardship after the resettlement, other indicators of quality of life suggested improvements. High capability of people in the former two villages might have led to the observed improvements. There likely existed some good practices by resettlers, from which important lessons for the future project may be obtained. To secure public consensus is essential for dam construction projects. The survey suggests that some good practices existed in the resettlement scheme applied. The good practices will significantly contribute not only for the better living condition of resettlers but also for obtaining public acceptance. However, under influence politically biases, the good practices may likely be overlooked, and it may lead to delay in improving modalities for resettlement scheme of dam construction projects.

699. (Paper)

**EIA Tools for Extreme Environments: Current Coverage and Gaps Remaining**

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A number of environmental impact assessment (EIA) tools exist or are in development for use in disasters, war, and other extreme environments. However, these procedures have not been developed in a coordinate manner and a number of gaps exist in coverage and scope. In addition, there is a need to link and integrate procedures and results to ensure assessments provide useful and effective input into crisis management operations. The presentation will review existing disaster-focused EIAs to identify the scale and coverage of each procedure. This review will be used to identify where new methods and procedures are needed, as well as how existing procedures can be modified to improve the overall utility of disaster-focused EIAs in reducing the impact of crises on individuals and societies.

170. (Paper)

**Impact of Income on Household Energy Use Patterns in Botswana: Implications for Economic Growth and Forest Biodiversity Conservation.**

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This paper analyses the impact of household income on energy consumption patterns in Botswana and implications for economic growth and forest biodiversity conservation. Botswana household energy consumption patterns entail high dependence on woodfuel given a small percentage of households (22%) connected to national electricity grid. Fuelwood in rural areas is abundant but scarce in urban areas due to depleted forests in their vicinity. An analysis of household energy consumption and expenditure patterns from Household and Expenditure survey reveals Botswana households spent 24% of income on energy with highest proportion spent on electricity. Households use electricity for lighting and powering multi-media equipment. About 70% of low-income households use woodfuel compared to 18% of the high-income households. With high tariff and low incomes, the majority of households remain woodfuel users. This implies loss of forest biodiversity where certain species are favoured for energy production. There has been limited uptake of electricity expansion programmes by low income households, who constitute the majority of those that cannot afford high connection fees and tariffs. Energy development without availing affordable energy to low income households whose main

source of energy is woodfuel may limit economic growth and forest biodiversity conservation.

329. (Paper)

**Strategic Environment Assessment of National Water Plan of Nepal**

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This study was made under 'Water and Energy Commission' of Nepal. The author was the team leader for the study and for the publication and for presentation, the author has obtained permission from the Commission.

Water is the major natural resource for economic development in Nepal. Annual water flow is 224 billion cubic meter. Water uses are Hydropower, 500 MW; irrigation 41% of agricultural land; and water supply is 66% of households. Snow-fed rivers are the main sources. Lack of comprehensive vision in water use in Nepal has delayed its proper development.

Water Resource Strategy (WRS) was developed in 2002 which identified water resource development programs. National Water Plan (NWP) was developed to operationalize the programs of WRS. National Water Plan was endorsed by the government in 2005. Strategic Environmental Assessment (SEA) is not mandatory in Nepal. However, NWP has undergone a thorough environmental examination at the strategic level. NWP screened and scoped out the environmental issues related to hydropower, water supply and irrigation development. Issues identified were analyzed and mitigation measures were prescribed with options. Methods described by Barry Sadler and Rob Verheem (1996) were adopted. Monitoring programs have been formulated. This paper deals with the detailed assessment of issues and the measures to ameliorate the adverse effects of NWP implementation.

256. (Paper)

**Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) on Melamchi Water Supply Project in Nepal**

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Kathmandu valley is the capital city of Nepal, inhabited by more than 15 million people. The people of valley have been facing an extreme shortage of water supply, and the demand is escalating as the population of the valley is increasing at the rate of 3.3 percent. Melamchi River located 40 Km north-east of the valley is a snow-fed perennial river and has been chosen to supply water for Kathmandu through 26.5 Km long tunnel. The project will have significant impacts on physical, biological and socio-economic/cultural components of the environment. Melamchi Water Supply project has undergone an application of EIA during its feasibility study and was approved by Environment Ministry of Nepal. Environmental Management Plan (EMP) was also developed and integrated into the project design for implementation. Therefore, this paper explicitly describes a detailed background on the project, EIA predictions, status of EMP implementation and issues of the participation and support of the local people. This paper also provides some lessons to learn on the modalities of addressing the demands and grievances of local people particularly from environmental management perspectives.

764. (Paper)

**East-West, Home is Best: The Komi-Aluminium Project and Lessons Learned**

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The "Komi-Aluminium" project will see the expansion of an existing bauxite mine on Middle Timan and the construction of a large scale alumina refinery in Komi Republic, Russia. The environmental and social assessment was conducted according to Russian legal requirements and the policies and standards of international finance institutions, notably the International Finance Corporation (IFC) and the European Bank for Reconstruction and Development (EBRD). Neither organization sees simply meeting the Russian requirements as an adequate level of an assessment. Thus the challenge faced was one of capitalizing on the technical and consultative components of the Russian OVOS requirements, and extending this in selected key areas to meet the

requirements of the international lenders, rather than running two separate assessments. In this paper is presented together with some key learning points.

Key success factors:

- Commitment of developer's top management to conduct best practice E&SA for all project stages
- Identifying where assessment approaches differed and what needed to be done to ensure for both meeting 'western' and Russian requirements
- Adoption of best practice PP approaches including stakeholder mapping and direct company-community dialogue
- Using the SEIA/OVOS findings as the building blocks for the development of Integrated Management System

733. (Paper)

#### **EA System in Russia: Latest Changes and Tendencies**

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The Russian EA system has changed significantly in the last three months within the huge ongoing Administrative Reform.

Traditionally, the Russian EA system includes two sub-systems: environmental assessment provided by the proponent (Russian abbreviation OVOS) and State Environmental Review (SER) provided by the competent authorities. During the last changes, the construction activities have been excluded from the subject of SER. The responsibilities of state reviewing of environmental issues have been moved to the construction authorities and to the latest project design stages (literally, the proponent must present the environmental measures within the project documentation). SER institutions are under reform now.

The OVOS process is still legally required by the Key Environmental Law. The fate of OVOS process is not clear now: according to the Russian legal requirements, OVOS must be done just for the SER subjects. OVOS is not mentioned as a part of the documentation package going to state reviewing.

One can see the significant EA capacity declining in Russia at the time. The joint efforts of the

environmental practitioners, environmentally responsible companies and NGOs are required to prevent the system from the total destruction. The international community could contribute by the promoting the best practice principles.

777. (Paper)

#### **The Changing Roles of Environmental Practitioners in Uganda**

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Uganda is undergoing tremendous growth and the environment is also being degraded at a very fast rate. To combat the pending catastrophe, the government of Uganda is becoming tough on investors and developers whose activities are degrading the environment.

Environmental Practitioners at the introduction of environmental assessment in Uganda were limited to assessment of the proposed projects only and advising developers and investors but with unchecked rate of development; environmental practitioners have taken up several roles such as land analysis, advocacy of environmental issues, monitoring and implementation of projects.

The purpose of this paper is intended to create awareness, to share with other practitioners from around the world and also to consolidate lessons learned during the assessment in their country and advise on the way forward in controversial issues in environmental assessment.

The outcome of this presentation is meant to educate others on other roles environmental practitioners take in the line of assessment and after the assessment period.

The paper will discuss problems and other issues that hinder proper use of environmental assessment as a tool of sustainable development.

590. (Paper)

#### **The Impact on Woodland of Refugee Camp in Kigoma Region, Western Tanzania**

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Tanzania has experienced a number of environmental problems caused by activities such as overgrazing, shifting cultivation, and illegal logging and is currently the country experiencing a number of environmental degradations in the western areas, caused by an influx of refugees from Burundi, Rwanda and Democratic Republic of Congo (DRC). The situation causes environmental



degradation and shortage of resources for local communities and refugees in the surrounding areas.

The area which local communities used for provision of fuel wood, clean water for domestic purposes, agriculture in the valleys, hunting grounds for bush meat, and source of medicine has now been changed to refugee camps.

The situation gets worse when limited existing resources are shared between refugees and local communities. As a result, conflict arises between the groups over the use of resources.

This study has realized that there is a need for some improvement of policies, research and enforcement of laws and by laws in the area in order to improve the situation between local communities and refugees in the area where problems of resource sharing occurs. The study also realized that the use of EIA as a decision tool is important to minimize the resource sharing problem in a particular locality.

753. (Poster)

**Invasion of Alien Plant into Nature Reserve Area (NRA) in Korea**

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We surveyed 5 NRAs in South Korea and surveyed for alien plant species appearance. Neither high moor nor Muechi moors was invaded by any alien plant. Prohibition of access to these marshes in mountain is likely effective to keep them free of alien plants. NRA in the estuary of river, NRA of marsh Upo in the field and NRA in two valleys of Mt. Jirisan are inhabited by 46 alien plant species. The most popular alien species are among *Compositae*, *Gramineae*, and *Leguminosae* with 17, 9 and 5 species, respectively. Alien seed seemed to reach islands in the estuary of river Nakdong by water flow in last two decades without noticeable human aid for seed dispersal. This indicates that management of any invasive alien species at the upstream water

body and watershed is required to lower the chance for its invasion into the downstream area of special conservation such as NRA. Waterfowl visit the islands frequently and might also bring alien seeds from distant regions to the islands. On the contrary, invasion of alien species in NRAs at marsh Upo and Mt. Jirisan is likely by human activities in addition to other transfer mechanisms such as wind and water flow.

408. (Paper)

**Does the Restoration of an Inner-City Stream in Seoul Affect Local Climate?**

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Urban climate changes associated with the restoration of an inner-city stream in Seoul, Korea, are investigated using observational data. The stream, called the Cheonggye stream, which had been hidden and covered with cement/asphalt for 46 years, runs 5.8 km eastward through a central region of Seoul. Intensive observations were made in the stream area for a number of summertime periods before, during, and after the stream restoration to detect the effects of the stream on its nearby climate and to quantify them. It is found that after the stream restoration the near-surface temperature averaged over the stream area dropped by 0.4°C, with the largest local temperature drop being 0.9°C. The stream effect on air temperature is also evident in the temperature distribution along a street traversing the stream. In the daytime after the stream restoration, sensible heat flux was greatly reduced and ratio of sensible heat flux to net radiative flux dramatically decreased. It is found that in the stream canyon the along-stream flows can be dominant even when the ambient wind direction is not principally in the along-stream direction and that the wind speed is weaker than the ambient wind speed.

751. (Poster)

**Lessons from Massive Outbreak of Fly and Midge at Landfill Site**

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Brine fly and midge massively formed from a landfill area at Jinhae bay in southern coast of Korea in the summer of 2005. Marine sediment at Jinhae bay was strongly disturbed, and the resulting slurry was continuously pumped into the landfill area of about 3km<sup>2</sup> from 2004. When the water depth of landfill area widely maintained low enough for the larvae growth, sudden massive outbreak of brine fly and midge resulted. Their unprecedented outbreak caused a serious environmental impact and called on improvement of which required environmental assessment and management for landfill on the coast. The authority decided to drain water from the landfill site to minimize the growth zone for the hazardous insect, and at the same time, applied chemicals to reduce the population size quickly. An alert system with stepwise response against insect development was developed. The area suitable for larval growth and larval density decided the warning level, which calls for stepwise response to reduce either the area for larval growth or larval density to predetermined concentration in wet or submerged bottom. Marine sediment with high content of nutrient would be treated before landfill to lower nutrient content. For proper environmental management and impact assessment, we suggested a number of modifications including assessment criteria.

756. (Paper)

**The Introduction of Alternative Environmental Assessment Model: APEMI IA MODEL**

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The introduction of strategic environmental assessment (SEA) has strengthened and extended the value of environmental impact assessment(EIA) as a foundation tool for sustainable development. In particular, SEA helps to overcome the limitation of project EIA as a 'stand alone' approach, applied relatively late in the decision making cycle. SEA is applied to policy, plan and programme (3p) proposals, when major alternatives are open and systematic consideration and implications can be given to their environmental effects. This process also corresponds to options appraisal of development proposal to find the best practical outcome having regard to all potential impacts.

Now Korea has an EIA system and prior environmental review system (PERS) which is a different type of SEA as an environment assessment (EA)system. Considering the above, we proposed the APEMI IA MODEL for an alternative EA system.

APEMI IA MODEL integrated the following three pillars: the first pillar symbolized the decision making cycle with planning process. The second pillar symbolized integrated assessment which tiering SEA and EIA with specific impacts assessment (e.g., social impact assessment, economic impact assessment, health impact assessment etc) in cooperated EMS. The third pillar symbolized EA best practical procedure of international association for impact assessment(IAIA).

573. (Paper)

**Radiative Impacts of Urban Aerosols in Seoul, Korea**

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Atmospheric aerosols play a major role in the radiative process of solar and terrestrial radiations. According to the optical properties of each aerosol particle, aerosols may contribute to the heating (by light-absorbing aerosols, e.g., black carbon) and cooling (by light-scattering aerosols, e.g., sulfate and nitrate) of the atmospheric temperature. The radiative impacts of urban aerosols are assessed through the combination of atmospheric radiation measurement and radiative transfer modeling. Sun/sky radiometer measurements during November 2000 to February 2003 at Seoul shows the annual mean (with standard deviation) aerosol optical depths (AODs) at 440 and 675 nm are 0.498 (0.368) and 0.294 (0.225), respectively. The ranges of AODs of each wavelength are 0.122-2.576 and 0.063-1.566, respectively. Fu-Liou radiative transfer model was employed to estimate the surface radiative forcing (SRF) due to urban aerosols at Seoul, Korea. If AODs at 550 nm are 0.1 and 1.0, SRFs were found to be -6.66 and -55.28 W/m<sup>2</sup>, respectively. Direct and indirect effects of urban aerosols need to be studied in order to more clearly understand the role of aerosols on the urban climate.

661. (Poster)

**Indicator Species for Climate Change Impact Assessment in Korean Peninsula**

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This study was carried out to investigate the indicator species sensitive to climate change and its impacts on the ecosystems and biodiversity of Korean Peninsula.

In the soil seed bank germination experiments of a montane grassland and a high moor with four different temperature conditions, we suggested *Geranium davuricum* and *Astilbe chinensis* var. *dauidii* as the candidate indicator species for a montane grassland of Sobaek Mountain. And we suggested *Eleocharis attenuata* var. *laeviseta* and *Juncus gracillimus* as the candidate indicator species for a high moor, Yongnup of Daeam Mountain. We predicted that landscape mosaic patterns will change due to dominance and displacements in vegetation composition.

In the distribution modelling of montane plants species and evergreen plants in Korean Peninsula, we compared the relative importance between bioclimatic variables. Analysis on percent of range change between different physiognomy showed that montane herbs are more sensitive than shrubs and trees. We suggested *Geranium eriostemon* var. *megalanthum*, *Clematis chisanensis* and *Clematis ochotensis* as the candidate indicator species for South Korea.

Candidate indicator species from our studies will be used as representative indicators for climate change impact assessments in South Korea.

351. (Poster)

**Grazing Impact of Zooplankton on Phytoplankton in the Heavily Polluted Coastal Waters and Its Application as a Tool of Marine Environmental Impact Assessment**

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We investigated interaction between zooplankton and phytoplankton in the food chain of the marine micro-ecosystem in two heavily polluted areas, waters off the Saemangeum and the Gwangyang Bay, then elucidated application of the results as a tool of marine environmental assessment. Spatial and temporal changes of phytoplankton and copepods, the dominant zooplankton, were examined and their grazing impacts on red-tide organisms and protozoans were calculated by combining data on the field population density and predation rates measured in the laboratory. Standing stocks of phytoplankton as a whole were largely influenced by the abundance of the dominant zooplankton grazers, *Acartia* spp., and heterotrophic and mixotrophic dinoflagellates played important roles as the food sources. In the coastal waters off the Saemangeum area, the copepods, *Acartia* spp. took up 21 - 31% of their entire biomass from dinoflagellates, *Prorocentrum minimum* and *Scirpsiella trochoidea*, while took up to 78% from *Gonyaulax polygramma* in Gwangyang Bay. However, dominant diatoms *Chaetoceros* sp. and *Skeletonema costatum*, known to be the major phytoplankton preys in general marine food web, contributed less in zooplankton grazing in these polluted coastal waters.

604. (Poster)

**Reduced Premature Deaths from Attaining the 8-hr Ozone Standard in Seoul, Korea**

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The current ozone standard in Korea is 60 ppb as an 8-hour average. 23 of 80 ozone monitors (29%) in Seoul Metropolitan Area (SMA) failed to meet the standard in year 2000, and the failure rate increased to 75% (60/80) in 2001, and to 82% (66/80) in 2002. This study aims to estimate the reduced premature deaths from attaining the ozone standard at these failed monitors using the BenMAP (the Environmental Benefits Mapping and Analysis Program, U.S. EPA). We developed concentration-

response functions to quantify the effects of ambient ozone on mortality in Seoul, particularly among persons aged 65 years and over. The mortality statistic was obtained from the National Statistical Office and ozone monitoring data from the Korea National Institute of Environmental Research. Discrete monitoring data were converted average ambient ozone levels for every administrative boundary in SMA using applied spatial interpolation methods. To simulate attainment, the distribution of ozone values was reduced by proportional rollback method. The reduced deaths were estimated for 2000 and 2015. Considering rapidly progressed population aging, increasing traffic, and hotter summers due to global warming, the benefit from reduced mortality for the elderly population will become more significant in the future.

755. (Poster)

**Water Stream Basically Determined *Sicyos angulata* Spread in Korea**

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We investigated distribution of *Sicyos angulata*, a burcucumber, in south Korea. About two thirds of precipitation concentrates in summer with a few typhoons a year which cause massive soil erosion. Because most seeds of *S. angulata* were embedded in dense mats of residual stalks grown last year or in top soil, the seeds are seemed to be easily freed from the mat or top soil by heavy rain, and freely transported to remote region by rapid river stream. They have the chance to be caught by dense vegetation or ground on the riparian zone where the water flow slowed down and overflow was recessed. Since the first appearance of *S. angulata* was noticed in the mid upper watershed of Han river in the early 1990s, a few ha vegetation covered with *S. angulata* developed each in several flat riversides and an island of the Han river in Seoul where natural vegetation was maintained for years. About ten years seemed to be enough to spread over 100km along the river from mid upper watershed to riverside and an island of the lower Han river in Seoul. This implies that *S. angulatus* may invade riverside rigorously and replace normal vegetation remarkably in Korea.

639. (Paper)

**Conservation Strategies of Han Estuary Ecosystem in Korea**

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A mouth of Han River is located in the west part of Seoul that is connected to the coastal areas. This area is unique because it provides a natural estuary for migratory birds and wetland plants. This area has been well maintained due to the military protection. This area has been used as habitat for international rare species such as cranes (*Grus spp.*), black-faced spoonbills and Chinese goose.

However, the wetland ecosystem is in danger due to construction projects such as roads, factories, and residential areas. Therefore, we need to protect the areas as a form of ecological reserves or migratory bird sanctuary. This study, therefore, suggested conservation plans and identified the critical habitat for birds and plants. This information can be used as a management strategy for conservation of endangered species in Han river.

599. (Poster)

**Distribution and Changing Trend on the Occurrence of the Kot-saem Chui**

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This paper examined distribution and changing trends on occurrence days of the Kot-Saem Chui (cold surge in the flowering season) from the end of February to early in April during 1973-2004. We defined an occurrence day of the Kot-Saem Chui as below 10% of the anomalies of mean daily temperature or below 10% of the difference of the daily mean temperature between the day before two days.

In the west coastal region, the occurrence days of the Kot-Saem Chui is higher in the end of February and less frequent in early in April. In the east coastal region, the occurrence days of the Kot-Saem Chui is higher in early in April. The Kot-Saem Chui is closely related with frequencies and intensities of Siberian anticyclones. The occurrence days of Kot-Saem Chui has decreased in the most areas except Ulleung island and the east coastal region.

372. (Paper)

**Environmental Specimen Bank and Environmental Impact Assessment**

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ESB is able to assess and improve the quality of analytical measurements as well as to compare the past and current environmental quality. It will contribute to monitoring the effectiveness of EIA projects and policies. Research in the development of ESB will improve the reliability of environmental monitoring, health impact assessment, and risk assessment in the EIA process.

Environmental impact assessment (EIA) in Korea has been improved markedly over the past three decades by enlarging the range of projects for assessment, instituting public participation, environmental monitoring, and strategic environmental assessment (SEA), and developing methodologies. EIA can be defined as the systematic identification and evaluation of the potential impacts of proposed projects, plans, programs, or legislative actions relative to the physical-chemical, biological, cultural, and socioeconomic components of the total environment. EIA is a continuously evolving system.

In this context the "environmental specimen bank" (ESB) is new tool in EIA. ESB is an archive for samples that can be used to document and assess the quality of the environment in which we live. ESB looks at changes in the concentration of human and environmental specimens over long periods of time through retrospective analysis of archived samples of a particular area collected at regular intervals. The idea of ESB was first proposed by German and American scientists in the early 1970s and has been established since 1979 in Germany, USA, and Japan. Korea plans to establish a National Environmental Specimen Bank (NESB) in 2007 and launch an operational pilot project by 2009.

312. (Paper)

**Introduction Scheme of Health Impact Assessment in Korea**

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Korea has 30 years of experience in EIA. Although EIA includes sanitation and public health subsection, considering health impacts, among 17 sections and 74 subsections, health impacts haven't been properly considered or have been ignored in many cases. The increasing awareness on the importance of them has triggered this study to seek an optimal introduction scheme of HIA.

Integrating HIA into the existing EIA process could be the most effective way to use the benefits in both legal and procedural processes and to avoid the confusion and overlap since the close relationships between environment and health impacts might be. It is desirable that the existing sanitation-public health subsection should be substituted by and extended to environment-health subsection with

sufficient determinants to properly consider health impacts.

When considering the first step of HIA, the prospective and quantitative approach is suitable more than the retrospective and qualitative one due to the lack of database available or cumulated. Similarly, an approach based on epidemiology and toxicology could analyze limited evidences and impacts related to disease, whereas one based on socio-science and psychology could provide the means available for predicting how the people and community will act to the change.

630. (Poster)

**An Assessment of Environmental Capacity of Jinhae City Using Ecological Footprint**

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This study is to demonstrate the relationship between the resource consumption and the environmental capacity, and to estimate the environmental capacity of Jinhae city, South Korea based on the ecological footprint (EF). All the EF values had increased over the past six years (1998-2003). Especially, the food EF per capita was increased by 12.2%. This result was attributed to the increase of dairy consumption due to the change of dietary life patterns, the increasing income level and the improvement of the standard of living. According to the result of the total EF analysis in Jinhae, the increase rate of total EF per capita was 13.6% and energy footprint exceeded this augmentation for six years. On the other hand, the results of the ecological deficit showed that Jinhae city requires the area of land over thirty times larger as the existing area to keep the current consumption level. Therefore it will be necessary to establish the urban planning and landuse planning considering the environment capacity.

644. (Paper)

**ResNet Analysis for Biodiversity Conservation in the DMZ in South Korea**

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This research proposes a way to prioritize areas for biodiversity conservation in Demilitarized Zone (DMZ) and Civilian Control Zone (CCZ), where rich biodiversity is under significant threats. The methods applied are ResNet algorithm in conjunction with MaxEnt to systematically prioritize areas of biodiversity value. ResNet provides alternative conservation area networks, using limited data. In this study, three conservation strategies are proposed. Firstly, west and midwest areas in CCZ and DMZ are identified as valuable for biodiversity. Most of these areas are composed of rice paddies, wetlands and plains attracting a variety of endangered birds for wintering. Thus, ecologically friendly agricultural systems should be maintained to prevent destructive urban land development. Secondly, the ResNet analyzed that far eastern part of the CCZ and DMZ includes areas of higher biodiversity values. The ecosystem in the area around Hyangro Peak is well preserved and provides habitats for a variety of mammals, linking two significant ecosystems in Mt. Kumkang and Mt. Sorak. Thirdly, southern areas of the eastern and mideastern CCZ show high quality of biodiversity compared to northern areas. The north parts in eastern CCZ were partly disturbed by military trainings and frequent landmine explosions, while south parts have been used for agricultural purposes.

754. (Poster)

**Abandoned *Brassica napus* Occupied Part of Yongsan River Bed**

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Kwangju municipality started to cultivate *B. napus* in the riverside of the Youngsan river for scenic beauty in 1998. The planted area was about 10 ha along the river. *B. napus* vigorously invaded the riverbed after cease of cultivation and expanded along the riverside. The whole riverside and riverbed above the water level, about 30 ha, is covered by *B. napus* with little stands of other herbaceous species in spring. Vegetation on the riverside and riverbed of Youngsan river at Kwangju had been composed of a variety of native herbaceous species with some willow trees until *B. napus* replaced the existed vegetation extensively. A large amount of *B. napus*

seed were dropped on top soil of the riverside and riverbed and embedded in soil or sediment. Soil erosion and turbulent mixing on site or downward transport of suspended soil in water stream powered by heavy rain resulted in three dimensional dispersal of seed in the river, which enabled self-sustainable and expandable population over years. Vegetation filled with *B. napus* may remove habitat for certain insect or fishes or birds which requires parallel stems and leaves in high density for nesting or egg laying on or among them.

713. (Paper)

**Geographical Barrier Mapping**

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'Geographical Barriers' can be defined as 'artificial and natural barriers that can block travelling of animals.' Geographical Barriers can be so easily classified and mapping of its distribution is so easy that we can understand distributions of ecological barriers by simply mapping the Geographical Barriers. This study suggests the mapping of the Geographical Barrier is very useful, especially for rapid assessment. The map can be mapped very easily by an ordinary person.

The "Travelling Probability" from a place to the other place may be reduced by the presence of Geographical Barriers. Travelling probability can be regarded as a permeability in porous media. Presence of "Geographical Barriers" lowers the "Travelling Probability." This index can be used as an "Index of travelling easiness."

717. (Paper)

**A Web-Based Expert System of East River Watershed in Korea for Conservation of Ecology and Environment**

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As one of the typical results of environmental disaster due to global warming, heavy local rainfalls caused big problems in East River watershed, such as water pollution in water body, loss of local road and bridges and landslide from mountain. So, it is now an imperative task to construct central decision and prediction engine for the policy making and project plan of the recovery works in Korean government. The authors started the modeling work of this watershed about 10 years ago, 1996, for the project of environmental impact assessment of proposed East River Dam. Since then, lots of robust results have been induced in the field of data survey, modeling, and GIS. All the works have been integrated as a web-based expert system of East River watershed for the conservation of this area. This web-based expert system includes the sub systems such as follows:

- Web-based knowledge acquisition system for all the environmental, ecological status and social status of East River watershed
- Web-based geographical information system
- Web-based modeling system
- Web-based monitoring system

The modeling system was built by using the newly developed model MFEMWASP and other conventional models such as SWMM.

716. (Paper)

**A Web-Based Partial Differential Equation Solver as a General Modeling System for Environmental Problems**

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A web-based partial differential equation solver (WPDES) was developed, which can be applied to various environmental problems. This general solver for partial differential equations was coded by using multidimensional finite element method. The key concept of this code is that it consists of the numerical modules for all the required derivative terms. Because of the highly object orient property of the invented numerical scheme, the user only has to assemble the modules for the specific problems. Using this model, the environmental problems such

as basin, surface and subsurface water, sewer, and sea can easily be analyzed without development of a new model for each problem. The model has been combined with GIS so that pre- and post-processing can be easily implemented. To prove the applicability of this Model, many conventional problems have been analyzed and a parameter study was performed. The commercial product of this model will come soon with the convenient feature of GUI and visualization. All the relevant systems will be offered by the web-based engine.

678. (Paper)

**Policies for Managing Urban Growth in the Seoul Metropolitan Region**

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In Korea, for the past several decades, urbanization followed by rapid industrialization has concentrated over 90% of the national population in urban regions. This rapid growth of metropolitan regions has resulted in various problems such as environmental pollution, traffic congestion, housing shortage, destruction of resource areas and so on. Furthermore, it has brought about the outward expansion of urban areas, causing urban sprawl that leads to the unplanned construction of housing and factories in the suburban region, resulting in the rise of housing prices, the destruction of resource lands and environmentally sensitive lands, the deterioration of levels of public service, the degradation of the environment, etc.

Under the rapid growth of urban regions, traditional measures of land use and development, such as zoning and subdivision controls and the planning of capital improvements, are proven inefficient to manage the various problems mentioned above.

This study analyses the progress and status of urban sprawl in the Seoul Metropolitan Region, with priority given to image of the past and present. Based on this, it evaluates policy measures that have been used, and suggests a desirable urban growth management policy.

685. (Paper)

**Prediction of Plant Communities Using Regional Climate Model in Korea**

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The effects of global warming are becoming more apparent on various parts of the world including dynamics in natural ecosystems. However, such research endeavors in Korea have made a very limited progress.

With Korea's complex geographic and topographical peculiarities, it does not use general circulation model because of coarse resolution. Therefore, climate impact assessment studies in Korea need a Regional Climate Model (RCM) of an appropriate resolution to incorporate the climatic peculiarities.

The purpose of this study is twofold. Firstly, it is to predict the future distribution of forest vegetation using RCM. Secondly, it is to make a comparative analysis with predicted communities and present communities in the Actual Vegetation Map.

The temporal scope of this study is 10 years, from 2041 to 2050. This study spatially incorporates forest communities of pine tree (*Pinus densiflora*), Mongolian oak (*Quercus Mongolica*), sub-alpine vegetations, and evergreen broad-leaved forests in Korea.

The sub-alpine vegetations in Mount Jiri and Mount Seorak are predicted to shift the dominance toward the Mongolian oak and the pine tree communities. In the identified vulnerable areas centering the southern and eastern coastal regions, the pine tree community is likely to shift to evergreen broad-leaved forests.

718. (Poster)

#### **Optimum Slope Analysis Method**

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The result of slope analysis is one of the most important siting criteria in planning of projects especially of golf courses in the mountainous forest region. However, the results of the analyses presented in PERS (Prior Environmental Review Statements) and EIA Reports were variable. It is easy to conclude intentionally that a proposed area is smooth enough for locating golf courses wherever they are. This study tried to formulate a standardized analysis method that produces reasonable results. The calculated slope is in most cases lower than the real slope. A simple and enhance method of calculating slopes of geographical faces is suggested to verify existing methods. Comparative studies of slope analysis for various regions was accomplished to study effects of Unit Grid Size. The study confirmed that the results of slope analysis is related to Unit Grid Size. The results of this study suggests that optimum Unit Grid Size of less than or equal to 25m x 25m is adequate in most cases.

689. (Paper)

#### **Cumulative Effects Assessments on Forest Damages by Additional Housing Development Projects**

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Recently, the effects from reckless exploitation of nature are increasing because most effects are caused by the aggregate of past, present, and future actions. Therefore, it has been important to assess cumulative and comprehensive effects by additional development projects.

This paper concentrates on effects on forest damage according to additional projects. The paper compares forest damages in two study areas: one is with only one housing development project, the other is with additional development projects. The paper adopted two methods to assess the cumulative effects. First, it assessed the temporal change of forest patch size and land cover. This paper detected the change of land cover/use from the forest before the development. Secondly, for spatial analysis, the paper compared housing development zones with the neighborhoods. In addition, for assessment of cumulative effects, the paper estimated the cumulative effects pattern by the degree of the change.

The result of the research appears that the damage is very serious, especially in small forests. It is assessed that the secondary housing development projects did more harm than the initial one. In addition, the additional housing development projects did more harm on forest damage than non-additional housing project in neighborhood.

692. (Paper)

#### **An Integrated Information Management System of Surface, Subsurface, and Alternative Water Resources**

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This study is aimed at the development of a comprehensive information management system for sustainable development of surface, subsurface and alternative water resources in Korea, which can be operated on the basis of the World Wide Web. The overall objectives were accomplished through the following four strategies: 1) All the relevant international data were surveyed through construction of related knowledge from the Internet for topics such as Web-Based DB, GIS, Model, Monitoring and Control on the mobile web server (notebook). 2) The construction of the knowledge acquisition system on the mobile web server includes the following issues: combination of WT, ET, and IT, Web-based information management and system control (Web-Based DB, GIS, Modeling, Monitoring and Control System), expert system. 3) The verification and commercialization strategy of the final product were carried out by the comparison with the international products from the institutions of DHI, Delft, etc. with respect to numerical analysis, parameters, GUI, visualization, integration with GIS, web based operation, and practicability. The construction of international research institute for this developed engine was being undertaken including nations such as Korea, Russia, America, Japan, China and Europe.

688. (Paper)

**Cumulative Effects Assessments on Forest Damages by Addictive Housing Development Projects**

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Recently, the effects by a reckless exploitation of nature are increasing because most effects are caused by the aggregate of past, present, and future actions. Therefore, it has been important to assess cumulative and comprehensive effects by the addictive development projects.

This paper concentrated on effects on forest damage according to addictive projects. The paper compared forest damages in two study areas: one is where only one housing development project, the other is where addictive development projects. The paper adopted two methods to assess the

cumulative effects. First, it assesses the temporal change of forest patch size and land cover. This paper detected the change of land cover/use from the forest before the development. Secondly, for spatial analysis, the paper compared housing development zones with the neighborhoods. In addition, for assessment of cumulative effects, the paper estimated the cumulative effects pattern by the degree of the change.

From the result of the research, it appears that the damage is very serious, especially in small forest. It is assessed that the secondary housing development projects did more harm than the initial one. In addition, the additional housing development projects did more harm on forest damage than non-additional housing project in neighborhood.

642. (Paper)

**The Environment Impact Assessment as an element of a Social Corporate Responsibility Concept: The Example of the BTC Oil Pipeline**

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A well-known example for a single pipeline entity is the Baku-Tbilisi-Ceyhan oil pipeline (BTC Co), a consortium headed by BP Amoco. On the financial, legal and technical level, but also in the context of Corporate Social Responsibility (CSR), these pipeline companies operate independently of any corporate guidelines of the consortium members, but have to adopt their own guidelines eventually. However, they are perceived as entities belonging to the company heading the consortium. Since these pipeline companies start their business with the planning of the project, the Environmental Impact Assessment (EIA) constitutes their first and most obvious statement on social and environmental issues.

The CSR approach of the BTC Co in the Caucasus Region and Turkey is to be discussed, with special recognition for the role of the EIA in the CSR strategy of the pipeline consortium. The discussion will focus in particular on the goal of the leader of the pipeline consortium, BP Amoco, to include the EIA in the company's CSR concept. We discuss the interdependences between the CSR approach of BTC Co and BP Amoco as well as opportunities, challenges and risks of that approach.

361. (Paper)

**Applicability of Strategic Environmental Assessment (SEA) to Urban Planning in Japan**

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This study aims to clarify an applicability of Strategic Environmental Assessment (SEA) to urban planning in Japan. A comprehensive urban plan (Master Plan) shall be prepared for each urban municipality. The Master Plan consists of spatial strategies and a structure plan of the whole municipality area and development plans of the municipal divisions. The present Master Plan generally focuses on economic and social aspects, and takes account of environment sometimes inadequately. We chose Chigasaki-City, Kanagawa prefecture, as a case study area, and tested whether the sustainability principle as the basis of SEA can be introduced in making the Master Plan, and adequate public participation can be attained. Introduction of the sustainability principle was found applicable if geographic data on economic, social, and environmental sectors are prepared beforehand the planning. Public participation was learned to be adequately made if the municipal government coordinates public meetings sufficiently before the official urban planning meetings. Actual acceptance by the policy decision makers of the Master Plan which takes account of environment more heavily may need some time, because land use control needs to be amended, particularly for the purpose of ecological preservation.

158. (Paper)

**Impact Assessment of Kenya's Biodiversity and Agriculture: Contributions of Meteorological Services**

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Kenya has an estimated 35,000 known species of plants, animals and micro-organisms. Over the years the country's biodiversity has drastically declined with accelerated development programmes and activities.

Kenya's meteorological department is the custodian of the meteorological data that span many years. Lack of the utilization of this information in development projects has led to devastating effects on biodiversity and agriculture. Clearance of the forest cover in Kenya to pave way for agriculture

has impacted adversely on weather patterns, biodiversity and agriculture in the country.

In the recent past, the country was devastated by consequences of drought, especially in the arid and semi-arid areas of the country. Economic ramifications of such weather conditions always top the agenda of the governments and the people. Utilization of meteorological information should contribute to the mitigation of foreseeable adverse impacts of weather on and ecological systems.

This paper examines the role of meteorological services in assessing impacts of development projects on Kenya's biodiversity and agriculture. It provides recommendations on how to make meteorological services more accessible and usable in assessing and predicting impacts of development of agriculture and biodiversity.

714. (Paper)

**Local Environmental Action Programme (LEAP) Successful SEA for Local Planning**

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Local Environmental Action Programme (LEAP) is a participatory decision support tool for local planning. It was developed in the nineties and mainly applied in East European countries. Recently the tool has been successfully applied in the countries of the Southern Caucasus and Central Asia. A conference on LEAPs in December 2006 in Tbilisi, Georgia, concluded that LEAPs are considered as a successful tool for local planning that is increasingly used for regional planning as well. In some countries LEAPs have already become mandatory for district planning. An evaluation of LEAPs in the Southern Caucasus country by the author showed that LEAPs could be considered as a Strategic Environmental Assessment inclusive type of planning. Nearly all SEA good practice principles are applied as part of the LEAP approach. The lessons SEA practitioners can learn from the experiences gained with LEAPS will be presented.

354. (Paper)

**Learning for Our Beloved River: HIA Applications in Tha Chin River**

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We Love Tha Chin River Society is a small civil society organization which consists of families, schools, temples, and communities. Its objective is to raise social awareness in reviving Tha Chin River,

which has been one of the most polluted rivers in Thailand since 1983. In 2001 the Society joined HIA training by Health System Reform Office and subsequently applied it to mobilize learning process about water gates construction in Tha Chin River. This helped to raise concerns and give equal and just value to the issue. Such process was done continuously before it led to a public forum on health impacts from this policy, participated in by the Society and its network, and the Department of Irrigation which was the project's implementator. The open debate finally caused the Government to cancel the project.

Additionally, the Society and its allied local governmental organizations use HIA to advocate healthy public policy, with the participatory approach and information sharing. This is to propose alternatives for health promotion through policymaking. The case of water management by Bangrakam Sub-district's administrative authority is an outstanding example to be presented in the paper.

496. (Paper)

**Environmental Assessment for the Large-Scale Waste Landfill Site in Seoul Metropolitan Area**

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SUDUKWON waste landfill site, the largest waste landfill site in the world, has been operated from 1992 for treatment of waste generated by 21 million people living in Seoul and its vicinity. SUDUKWON waste landfill site consist of four landfill sectors including #1 landfill sector that caused the dispute with the local residents in the first half of the 1990s

because of environmental degradation such as bad smells, dusts and noise, etc.

The environmental aspects of the large-scale waste treatment facilities including SUDOKWON landfill site are being assessed by the authorized environmental institutions every three years and should make public the result of assessments.

The environmentally-adverse-effect-zone of SUDOKWON landfill site had been recognized, particularly inside of 5km from the boundary line of the landfill site; nevertheless, since 1996 the legally recognized area is the inner part of 2km.

The research team of Yonsei University had reported that the environmentally-adverse-effect-zone of SUDOKWON landfill site could be scaled down to the legally recognized 2km zone based on the comprehensive environmental assessment during 2004~2005.

775. (Paper)

**Health in SEA of Spatial Planning: The Danish Guidance and Practice**

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A wide range of factors within spatial planning can affect health. It is therefore an important scope for SEA of spatial plans to protect and improve people's health. Due to the EU Directive 2001/42/EC, health has been made explicit in Danish legislation and guidance. The paper examines lessons with the inclusion of health as a formal component in impact assessment of spatial plans. First it reviews the Danish SEA guidance regarding the assessment of the broader concept of environment. Secondly, based upon a documentary study of almost 100 environmental reports and interviews with planners, the paper analyses and discusses how health impact considerations are incorporated in SEA practice. SEA's successes and shortcomings of how to include health are discussed and suggestions for institutional development are presented.

617. (Poster)

**Prioritization of Watershed Restoration Proposals Using Rapid Impact Assessment Matrix**

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This study shows how Rapid Impact Assessment Matrix (RIAM) scoring system was used in the prioritization of the proposals for watershed restorations planned in Sotkamo area, Finland. A total of 39 project proposals were evaluated by an expert group of four members. The assumed impacts of the proposed projects were divided into six different categories and each category formed one prioritization criterion for assessment. The environmental impacts were considered as the impacts to the landscape, to the state of the natural environment and to hydrography. The social impacts were assessed as the impacts to recreational use, fishing and economics. In addition the population around the proposed restoration sites and the costs of the projects were included in prioritization as two background criteria. The RIAM scoring was used in comparing the impacts of the different projects and the prioritization rank for each project was counted.

435. (Paper)

#### **Community Empowerment in Health Impact Assessment**

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This presentation will be of interest to individuals working in the areas of environmental, social and health impact assessment integration; capacity development; and/or Indigenous Peoples

Health Canada has over a decade of experience in Health Impact Assessment (HIA). The four volume Canadian Handbook on Health Impact Assessment has been freely available on the Web ([http://www.hc-sc.gc.ca/ewh-semt/pubs/eval/index\\_e.html](http://www.hc-sc.gc.ca/ewh-semt/pubs/eval/index_e.html)) since 2005. The next phase is a Web-based training course on HIA within the mining sector to be available in 2008.

More needs to be done, particularly with small, remote communities. Health Canada has focused on improving community engagement in HIA by promoting community-based research (questions developed by the community, research conducted by the community, results disseminated and used by the community for decision-making). Vulnerable populations within the community assess human health risks and impacts related to a development project and devise contingency plans and adaptations strategies to address these risks and impacts. Because the research is done by communities, they have greater capacity to develop and disseminate their own culturally sensitive information on the health impacts of a development project, thereby enabling them to make better decisions on how to protect their health.

This presentation will highlight work with Indigenous communities to build research capacity, integrate western science with Traditional Knowledge and communicate findings.

709. (Poster)

#### **Sustainable Siting of Golf Courses in Mountainous Areas in Korea**

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There are demands and arguments over siting of golf courses in mountainous areas in Korea. Sitings of golf courses have considered only a few environmental aspects. Locating many golf courses in a limited area, application of conventional designs to mountainous areas and construction of golf courses without considering surrounding environments may give negative effects on environments.

This study recommends environmental considerations which may not be legally treated and provides policy measures to develop sustainable golf courses.

Various regulations executed by different ministries regarding golf course siting, which are lack of reasonable background information, are difficult to apply, and are enforced redundantly, should be corrected or supplemented.

In case of overcrowded location of golf courses in a limited area, ecological corridors would be seriously damaged. Ecological diversity should be considered even though particular endangered or protected species are not found in the proposed area.

Since a tee, landing site, and the green are the most important components in the golf courses, natural environment may be most properly preserved if designers guarantee conservation area far more than that suggested by regulation guideline.

44. (Paper)

#### **Environmental Changes and Human Health: Towards a New Approach**

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Ecohealth can be applied for the evaluation of the health level of the members of the rural communities (or urban) and their well-being level in their socioeconomic and ecological context. How to secure a healthy environment through appropriate

natural resource management is a fundamental question, particularly in rural areas. Applying innovative approaches that capture social, environmental and economic aspects is needed. The usage of sewage water in agriculture is familiar in Morocco and its impact on health and ecosystem components is evident. In the case of Mzamza, local community in the Chaouia region has demonstrated that sewage use has affected the quality of soil, ground water, health and plants. The contribution of different disciplines and institutions was a challenge to success the project activities. The main objective of the project is to push local communities to better manage its ecosystem and human health. In addition to the technical alternatives, institutional innovations were elaborated in order involve the community more in the process of developing appropriate health and environment programs.

646. (Paper)

#### **Poverty and Inclusion of Indigenous Peoples**

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*Indigenous people's involvement in hydroelectric development in Canada: reinforcing their role in impact assessment by means of a new participatory mechanism at the design stage of a project.* The Crees (Eastern James Bay) gained in 1975 full representation in the environment review process by means of permanent membership on panels alongside government's counterparts. In 2002, they signed an agreement with the state owned utility providing for the implementation of a participation and consultation mechanism in the early planning stage of a CDN\$5 billion project. The purpose was to circulate in the affected communities all relevant information on the project and its impacts, to relay to a special joint committee the concerns of the communities regarding the project and to act as facilitator during local public consultation and to keep informed the local authorities on the progress of studies and the project design.

This paper reports on the efficiency of this new mechanism. This study was carried out between 2003 and 2006 using interviews and questionnaires to evaluate over time the familiarity of hunters/trappers and local administrations with the agreement and ensuing mechanisms, the visibility of the project newsletter and the satisfaction over the proponents' information activities.

487. (Paper)

#### **Sustainable Development in Practice: Infrastructure for the Third Generation Mobile Telephone System in Sweden**

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The infrastructure for the third generation of mobile telephony, UMTS, is under construction in Sweden. Within three years, four operators were to build competing systems to cover 99,98 % of the population.

The case of the 3G infrastructure illustrates how the sustainability issues are handled in planning and environmental management, with conflicting goals between institutional levels and competing legislation. At the national level, economic and technological optimism and regional policy is in conflict with environmental and sustainability goals. No SEA was made of the entire system. The infrastructure is assessed through one permit for each mast, at the local level, giving the administrative system an extreme challenge. There are unexpected environmental and social impacts as a result from the lack of comprehensive assessment.

Based on surveys of all local planning authorities, a regional sample of permit processes, and examination of legal cases, the paper examines the outcomes of the fragmented assessment of the local permit process level: from a sustainability perspective, what are emerging effects and conflicts? An analysis of the potential of a comprehensive national SEA of the system to uncover unsustainabilities will be made.

346. (Paper)

#### **Environmental Issues in Mining Sector of Vietnam and Application of the Environmental Management System**

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The mining sector of Vietnam is, when considering the site and technology, rather poorly developed. However, as the Vietnamese Economy is growing at rapid rate, the mining industry is increasingly to become an important part of the country's economy. But the mining industry also has environmental impacts. Environmental protection in the Vietnam mining industry must therefore become an important issue in the sustainable development strategy of Vietnam.

Environmental Management System is new in Vietnam. EMS has been applied as a national standard in Environmental Management (TCVN ISO 14004:1998, published in 1998 as "Environmental Management System-regulation and guidance."). Up to now EMS is being applied in varied fields in Vietnam. The paper contains:

- General information of mineral resources and mining sector in Vietnam:
- The environmental impacts caused by mining activities:
- Environmental Management System (EMS) and its application in Vietnam.
  - The international EMS –ISO 14000 will be introduced in general
  - Application of EMS in mining areas of Vietnam.

704. (Paper)

#### **SEA of National Transport Planning**

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In 1994 PERS (Prior Environmental Review System) was introduced to South Korea in order to conduct environment assessment on a planning level. As the PERS does not fulfill the conditions of a basic structure of a SEA, it had to change fundamentally through changes of the Basic Environmental Policy Act in 2006. The new PERS has now the structural features of a SEA. In order to realize legal clauses of the new PERS, guidelines of road planning were ordered by the Korean Environment Ministry.

This paper defines important contents and methods of the guidelines and with that it tries to expose the characteristics in comparison to the EU SEA-Directive.

640. (Paper)

#### **Comparison of Post-Monitoring of EIA in Korea with UNEP EIA Training Resource Manual**

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Post-monitoring after EIA implementation is to heighten the efficiency of consultation of EIA and this can secure consultation of EIA in construction site as a supplementation of EIA system. The post-monitoring is unique to only a few countries enforcing the system and Korea is one of those countries enacting a post-monitoring system as a part of the EIA process. In Korea there are 150 EIA consultations per year and over 1,000 cases of post-monitoring are currently in progress.

This study compares the current post-monitoring system in Korea with the standard UNEP EIA. The cases of post-monitoring are mostly controlled by Dong-sung Engineering that is authorized by government related organizations. First we analyzed the legitimacy of the post-monitoring system based on the EIA regulation in Korea and compared the current system with UNEP EIA. Second we chose 13 topics from UNEP EIA to identify the current system in Korea and how those 13 items are well applied in the construction sites.

We examined the common factors of UNEP manual and the application in post-monitoring system in Korea, and sought for the problems of application in the EIA in Korea.

390. (Poster)

#### **Heat Wave and Its Health Impact in Korea**

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In order to assess the impacts of heat waves on human health, heat wave records were investigated during the past 30 years (1971-2000). The result shows that occurrence, frequency and duration of heat waves in Seoul have increased during the past 30 years. In addition, the increasing trend of the frequency and duration clearly appears in late spring and early autumn as well as summer. The regional acclimation effects of heat waves in major cities of South Korea are also assessed. There was a latitudinal acclimation effect, implying inhabitants living in the higher latitudinal cities in Korea (for example, Seoul and Incheon) are more vulnerable to the enhanced heat stress or heat wave. During the period of late June to early August of 1994, episodic hot temperature was recorded in the East Asia region. The climatic causes and impacts of the episode was also investigated. Health impact assessment studies of heat waves in the large cities located in mid latitude region of northern hemisphere should be more clearly addressed

because heat wave is regarded as a major weather-related disaster.

594. (Paper)

**SEA and Integration of Development Planning and Environmental Planning in Korea**

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Since 1981, EIA has been introduced in Korea, but project EIA can suggest only mitigation measures and a limited range of alternatives.

Therefore, Prior Environmental Review System (PERS) has been introduced for environmental assessment of administrative plans and small scale development projects based on Framework Act on Environmental Policy (FAEP) Amendments of 1999 with SEA introduced incompletely.

FAEP Amendments of 2005 have added the concepts of SEA such as expansion of kinds of administrative planning, the earlier timing, and public participation into PERS. But the SEA on development(urban) planning has still some problems. For the effectiveness of SEA, the followings are required.

First, the strong linkage and integration of development planning and environmental planning could be the implicit method of SEA free of Legal SEA. Second, the focus of SEA should shift from living environment to socio-economic environment. Third, SEA had better be expanded to non-spatial or socio-economic policy and planning. Fourth, Total Water and Air Pollution Load Management System should be included as a significant and substantial standard or criteria. Finally, the inter-media or comprehensive environmental carrying capacity is required for desirable SEA.

676. (Poster)

**Environmental Eco-Plan of Developing Multi-functional Administrative City in Korea**

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The Korean government planned to build the multifunctional administrative city in the middle of Korea for decentralization of over-population in Seoul and its metropolitan areas and for efficient land use. The idea to build the multifunctional administrative city was conceived as a symbol to showcase how a city can be environmentally inviting. The Planning Committee and the PERS (Prior Environmental Review System) Team analyzed

Eco-Axis, Water Stream and Wind Corridors in order to establish preservation zone that will take approximately 50% of the whole area. With guarantee of more than 50% of preservation zone, the city will evolve into a balanced ecological city.

The city aimed to be environmentally friendly so that it accommodates many human needs: ecological preservation, natural resources preservation, and convenient amenities. The study shows findings produced from impact analysis and suggests strategies to alleviate adverse impacts.

650. (Poster)

**Health Impacts of Economic Cycling: Implications for HIA in Resource-Based Economies**

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Employment, income and wealth are well-established determinants of health and are commonly considered in Health Impact Assessments. Increases in community employment and in personal income have generally been associated with better health outcomes. However, little attention has been focused on the effects of the transition between periods of economic stagnation and economic vitality. The relationship between economic cycles and health does not necessarily mirror the relationship between employment/income/wealth and health. Rather, economic cycling and the circumstances in which it occurs are health determinants independent of employment and income. For instance, evidence has shown that contracting economies may be associated with worse health outcomes than economies with greater--but stable--levels of chronic unemployment. At the same time, healthy adaptations in the working population in response to economic contraction may offset some negative health impacts arising from job loss. Understanding the complex relationship between economic cycles and population health is of particular importance in assessing the health impacts in resource-based economies or other communities that rely on a single-source employer. This poster presents the evidence and theory linking economic cycles to population health. The implications for the inclusion of economic cycling within the scope of certain HIAs are considered.

768. (Paper)

**Environmental Impact Assessment for Waste Treatment Options**

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Environmental Impact Assessment (EIA) is a formal study process used to predict the environmental consequences of a proposed major development project. Waste treatment facilities can cause major negative environmental impacts if not managed properly. This paper describes the application of life cycle assessment for evaluating various waste management options in Korea. The impact assessment method by IWM-2 is carried out for comparing the potential environmental impacts of waste treatment methods. The key environmental issues were evaluated to predict the impacts on environment. In addition, mitigation measures and monitoring plan were proposed to prevent or minimize any possible negative impacts.

715. (Paper)

**The Study of the Integrated Evaluation and Management System for the Artificial Ground Greening in Urban Area in Korea**

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The artificial ground greening is regarded as an effective method for improving urban environment and creating ecological places for people. In fact, there are many studies about the artificial ground greening, for example, rooftop greening, wall and street planting etc. However, these studies are just focused on a case by case basis, not integrated analysis which means integrating of the artificial ground greening and its effect evaluation (reducing temperature, runoff treatment, economical effect, and ecological restoration etc.). The objective of this study is to develop the integrated evaluation and management system for the artificial ground greening. We investigated existing artificial ground greening areas, experimented and monitored about reducing temperature and runoff, and evaluated regional environment. Finally, these data were developed the integrated evaluation and management system, and constructed database for the system. The integrated evaluation and management system consists of 'target areas selecting and effect analysis' and 'regional vulnerability evaluation and effect analysis.' A user can identify effects as selecting of types of soil and vegetation for rooftop greening, wall and street

planting in one part of target areas selecting and effect analysis, and effects as selecting of greening areas in the other part of regional vulnerability evaluation and effect analysis.

588. (Poster)

**Water Quality and Contamination of Transboundary Watershed in Northern Mongolia**

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The surface water quality in Northern Mongolia has been examined in order to study the effect of human activities such as agriculture, cultivation and mining. Surface water samples were collected in October 2005 and June 2006 and subsequent geochemical analyses have been carried out. Relatively large-sized rivers, especially the Tuul and Orkhon rivers, flow through the study area. They are merged to Selenge River in downstream area and eventually flow into Lake Baikal in Russia. Thus, there is a possibility that some contaminants may influence the environment of the Baikal watershed to cause a significant transboundary environmental problem.

The result of analyses suggests that major dissolved constituents in surface waters are mostly derived from rock weathering. Mining activity accelerates weathering and the inflow of suspended particles. Very high turbidity is one of the major concerns in this area, which is caused by strong erosion of river banks in meandering river systems, overgrazing by animals, and human activities. Although water quality problem in geochemical aspect due to mining is not significant at present, it should be continuously examined to minimize the transboundary movement of potential aquatic contaminants in the Selenge watershed environment in Northern Mongolia along with conserving the Lake Baikal.

635. (Poster)

**The Application of Integrated Assessment System for Urban Sustainable Development**

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The purpose of this study is to develop the integrated urban indicators, and to assess the sustainability in 45 cities of all over Gyeongsangnam and Buk-do in Korea. First of all, the indicator systems were developed base on "field," "section," "item" and "detailed indicator." The fields were classified into four categories; environment, economy, society-institution and quality of life(QQL). And these indicator systems had 19 sections, 50 items, and 106 detailed indicators in 4 fields. According to the assessment results of the sustainability of study area, Tongyeong had the highest score (82.5) in the environmental sustainability index. In the economical sustainability index, Pohang, Gumi, Changwon, and Yangsan scored more than 79 points. Ulsan, Geoje, Yangsan in the society-institutional sustainability index and Jinju, Munkyeong, Changnyeong showed higher in the QOL sustainability index had higher scores than other cities. In case of Jinju, which had the highest sustainability in QOL, was assessed to have the highest score of integrated sustainability index, while Ulsan had the lowest score.

It is concluded that the proposed indicator system can provide the useful assessment tool for an urban sustainability and support a decision-making role for sustainable urban planning.

398. (Paper)

**Health Impact Assessment in Korea**

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Korea has two types of environmental assessment systems, that is, preliminary environmental review system (PERS) and environmental impact assessment (EIA). The ultimate purpose of PERS and EIA is environmentally sound and sustainable development (ESSD). There is the hygiene and public health part in EIA; however, our environmental system does not consider health impact resulted from development efficiently.

So, health impact assessment (HIA) has been a new topic in the environmental assessment system of Korea recently. Furthermore, in order to test applicability of HIA to Korea, a comprehensive study on HIA has been launched after the 26th IAIA international conference at Norway. Principal expected results of the study are as following:

1. Purpose: Support for decision-making
2. Health Determinants: Personal (age, sex, gene), Physical (air quality, noise, soil, water quality, waste, accident etc), Socio-economic (employment, income, education, community segregation, crime, etc.), Approach to social services (hospital, school, park, leisure facility, police station, etc.)
3. Implementation: Integration with EIA
4. Characteristic: Prospective
5. Type: Mini, Intermediate, Comprehensive

Moreover, in order to prepare effective HIA implementation in Korea, health impact statement for industrial complex development and waste treatment facilities like incinerator, landfill site operation has been made.

684. (Paper)

**Building of Web-Based Information System for Environmental Impact Assessment of Korea**

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The official name of the system is 'Environmental Impact assessment supporting system (EIASS).' All the files and database contents are written in Korean. The system website composed of English will be prepared soon. This system is now working at <http://eiass.go.kr>.

The KMEV and KEI started to build web-based system for construction of comprehensive information database of environmental impact assessment in Korea, funded by NIA. The purpose of this system building is to make computerized database of the information of past EIA projects such as the text of EISs and various research data for EIA, and to provide these database to the public, government officials, and project developers for helping them to reuse past EIA data and to estimate the feasible status and environmental impacts about the developing projects in the future.

In this system, more than 3,000 of past EISs and EIA agreement results, which are scanned and converted to PDF files with bookmarks, are included. project outlines, details of environmental protection near project sites, and various environmental quality measurement results were extracted from the PDF files of EISs and converted to database format. These database can be searched in the system as GIS-based GUI.

Many developers should spend quite a time on completion of the EIS during project planning. Using this system, The authors would expect active reference of past EIA database, time reduction for completion of EIS, and effective balance between environmental preservation and development.

570. (Paper)

#### **Building Wind Impact Assessment of Skyscrapers in Seoul, Korea**

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Many skyscrapers have been constructed for residential use in Seoul since the late 1990s. In particular, there are nine skyscrapers with height of more than 160 meters within one block in Gangnam-gu, located in the southeast of Seoul. In this block, the height of the tallest building, Towerpalace III, is 264m. It is obvious that skyscrapers tend to make influences on urban microclimates; however, the microclimate impact assessment needs to be more

sophisticated. There are several attributes of microclimate impact due to skyscraper construction, such as building wind, solar radiation blocking, etc. Particularly, the building wind impact assessment has not been done properly. Therefore, this study aims to assess the building wind impact properly before construction. For this, wind speed and direction are measured by anemometer in the field, and simulation results were derived using the Computational Fluid Dynamics (CFD) model. The ultimate goal of this study is to figure out the phenomena of building wind impact and also to provide essential basic data for establishing proper guidelines in building wind impact assessment for skyscrapers in Seoul.

771. (Paper)

#### **Evaluating Microclimatic Impact Assessment of High-Rise Buildings in Korea**

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Since the late 1990s, lots of high-rise building have been built in Korea. This creates many micrometeorological impacts due to turbulence from nearby high-rise buildings. Thus, it needs careful and accurate impact assessment for keeping the quality of life of residents who live in high-density developed urban areas. However, the Ministry of Environment does not provide adequate environmental impact assessment (EIA) guidelines. Only the Seoul City Government provides the guideline. In this study, the current guideline has been reviewed, and applied in a real situation. Then the results were investigated to figure out how EIA has been done. Therefore, the purpose of this study is to evaluate the current EIA guideline and to propose the adequate EIA guideline in Korea.

696. (Paper)

#### **Management of Korean Biological Resources for Access Regulation and Benefit-Sharing**

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The Convention on Biological Diversity has authorized national sovereignty over biological resources so that legislative framework should be established. In biological resources management, the access to biological resources and the benefit sharing arising out of their utilization are the two most important steps. Bonn guidelines adopted by the 6th COP of the Convention contain PIC (Prior

Informed Consent) and MAT (Mutually Agreed Terms) indispensable to implement the access and benefit-sharing process. Korean laws related to PIC and MAT include Wildlife Protection Act, Seed Industry Act, Ocean Ecosystem Conservation Act, and etc. Among these acts, the Seed Industry Act works well but the other acts do not have practical regulation regarding on PIC and MAT. Therefore, Korean national regulation on these issues should be revised. For example, Wildlife Protection Act which contains the list of biological resources required export permit still does not have access regulation for foreigners. In this meeting, the development direction and improvement way for the Korean biological resources for access regulation will be discussed.

686. (Paper)

**Deforestation Patterns Analysis of the Baekdudaegan Mountain Range, Korea**

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The Baekdudaegan Mountain Range is a backbone of the Korean Peninsula which carries special spiritual and sentimental signatures for Koreans as well as significant ecological values for diverse organisms. However, in spite of the importance of this region, the forest of Baekdudaegan has been damaged in a variety of human activities by highland vegetable growers, etc. The goal of this study is to quantitatively analyze the forest damage in the Baekdudaegan preservation region through land cover classification and change detection by using satellite images, which are 1980s and 1990s Landsat TM and 2000s Landsat ETM+. The analysis was executed by detecting land cover changed areas from forest to other and analyzing changed areas' spatial patterns. Through the change detection analysis based on land cover classification, we found out that the deforested areas were approximately three times larger after the 1990s than from the 1980s to the 1990s. These areas were related to various topographical and spatial elements, altitude, slope, the distance from road, and water system, etc. This study has the significance as quantitative and integrated analysis about the Baekdudaegan preservation region since 1980s. These results could actually be utilized as basic data for Baekdudaegan forest conservation policies and management.

403. (Paper)

**Post Evaluation on the Biological Habitat and the Human Using Structures after Natural Restoration of Jeonju-cheon, South Korea**

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Engineering techniques for naturalizing stream corridors were introduced to restore the destructed stream to its natural status in the early 1990s. Stream restoration projects have been carried out especially for reconstructing ecological environments. However, these projects have been mainly focused on human-based facilities. Eventually these restoration projects failed to keep appropriate natural characters because human-oriented facilities were over-introduced, such as features of general public parks. In the stream restoration project, a balanced application between ecological restoration and appropriate attention for the human-using structures could be one of the critical themes, which could be issued through post occupancy evaluation. The Jeonju-cheon project has been performing since 1998, during which time an annual ecological monitoring program has been executed. Therefore, this research is going to provide the practical planning guidance. The first phase is to evaluate the effects on the eco-stream project by analyzing the biological and hydrological factors such as fishes, vegetation and water quality. The second is to survey and analyze the characteristics of human-used space through investigation on density and preference by means of a questionnaire survey and site observation. The third is to propose the planning guidelines for appropriate restoration.

563. (Paper)

**Establishment of Park and Green Areas for the Development Projects of Residential Areas**

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To achieve the sustainable development for the 21st century it is necessary to consider the environmental conservation in advance. In Korea every project with over a certain size it is necessary to consider the environmental plan first and development plan should be followed. This should be in practice as a form of preliminary environmental assessment and EIA.

It is also important to secure green areas when the development project is launched so that habitat for flora and fauna should be preserved for the common welfare of human being and living organisms. This is especially true in the urban areas.

This paper considers the importance of securing green areas as a form of parks and forests. In

residential development projects it is required to secure certain amount of green areas.

This paper considers the factors for the residential areas in terms of scale, number of residents, green areas per person, and evaluates the amount of securing green areas. To see the % of green areas depending on spatial and temporal trends, we applied linear regression model.

690. (Paper)

**Landscape Ecological Assessment of the New Urban Development on Regional Landscape Connectivity**

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In Korea, new urban development is planned with regional spatial planning to minimize the negative effect of the new urban development, but there are significant difficulties to analyze the effect of the new urban development on regional landscape connectivity.

This study suggests to adopt a landscape ecological methodology to quantify the regional landscape connectivity in the regional spatial planning and to monitor the landscape connectivity change along with the urban development. The land use/land cover map is used as a primary dataset in this study and is analyzed by using GIS. This study analyzes the vegetation patches of the study area and then ranks each patches based on its area and distance to the nearest vegetation patch.

The result of this study shows the feasibility of the landscape ecological assessment of the new urban development at the landscape scale by using LULC map and GIS. Although the methodology tested in this study is needed to be refined to apply in the field, the methodology would be a useful tool for EIA to analyze the effect of a suggested development plan and SEA to evaluate the alternatives of a regional spatial plan.

520. (Paper)

**The Evolution of Environmental Planning for Korea's Local Government**

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Environmental planning is essential to develop and be in harmony of society and environment. Environmental planning is based on the Environmental Policy Act and it should be formulated at stated intervals. At present environmental planning is constructed to the system and substance which are difficult to cope with economic development pressure. Therefore, the evolution of environmental planning needs to be introduced.

This paper suggests the necessity of the novel plan based on environmental planning in Korea, which can analyze the environmental planning system and figure out the issue present planning. And, we will present the evolution of environmental planning which include spatial, ecological and technological respects in the basis of the principle of Kangwon-do's environmental planning.

592. (Paper)

**Energy and Products from Agricultural Biomass: Prospects and Issues**

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Recent changes in world energy markets have led to heightened awareness of dependence on foreign supplies of petroleum, both in the U.S. and in many other developed and developing countries. Concerns about foreign oil costs and supply dependability are leading to revived interest in alternative energy sources. One of the sources that has attracted particular interest is biofuels derived from agricultural biomass. Environmental concerns also support renewed interest in renewable energy sources.

The recent growth of the U.S. ethanol industry demonstrates the potential of biofuels. From an annual production of less than 1 billion gallons in 1990, ethanol production has grown to 4.9 billion gallons in 2006. However, corn supply will likely limit ethanol's role in U.S. energy markets. If bioenergy is to expand its role in national energy markets, a broader resource base and corresponding processing technologies are clearly needed.

This paper reviews potential sources of biomass, including agricultural residues and dedicated energy crops. Biomass conversion technologies also are discussed. The concept of a multi-product biorefinery using agricultural residue (specifically wheat straw) as feedstock is examined, and some of

the economic development and environmental implications of an emerging bio-based economy are examined.

666. (Paper)

**Focus on Asia. Difficulty and the Possible Conservation Approach of Conservation in EIA of Project in China**

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The current status of the biodiversity conservation in EIA in China is analyzed. We find that the biodiversity conservation is too difficult to be implemented in construction projects because of the investing mechanism, the limited period of EIA, the lack of conservation knowledge, and professional and post assessment of environment impact. It is pointed out that the possible conservation approach may be enhancing SEA, executing the law strictly, perfecting the guideline and enhancing technical training and communication.

438. (Paper)

**Informing the Environmental Impact Assessment of Major Pipeline Projects Through the Use of Environmental Management Systems Information**

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The National Energy Board of Canada is a federal regulatory tribunal overseeing all aspects of the construction and operation of major hydrocarbon transmission pipelines, including environmental protection. The Board's regulatory approach is to minimize regulatory burden while maintaining a high standard of environmental protection. To achieve this, the NEB is working toward implementing a flexible, risk-based regulatory approach in which processes fit the scope and range of applications it receives. The NEB requires its regulated companies to develop and implement environmental management systems relating to all aspects of their business. In evaluating the companies' compliance, the NEB undertakes formal audits of these systems to ensure they are appropriately developed, maintained and implemented. The Board has recently initiated changes to its regulatory processes to utilize companies' management system information collected during the audits to enhance its application and assessment processes. This paper will discuss how information collected during an environmental management systems audit is

integrated into an environmental impact assessment for a proposed pipeline project and how knowledge and lessons learned are transferred through all stages of the pipeline life cycle.

453. (Paper)

**Effect Analysis of the Industrial Policy of Shandong Province**

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As one of the most significant economical policies, industrial policy is of high intensity of investment and resource exploitation and relates to many factors with wide impacts. The article analyzes the effects of different periods since our country's setup from the angles of economic, society and environment. Conclusion shows that the misplay of heavy industrial policy before innovation and opening not only led to lower social and economical benefits, but those industries of lower technology and small scale also consumed more resource and energy. The consumption of energy doubled by 21 times till the year 1978, at the same time more contaminations entered the system of water and atmosphere. Though it worked actively to the economic after the country's innovation and opening, however, its effects to environment was negative and pollution became more serious as time flowing. In the year 1996, there was a redress to the industrial policy, but the most important is that the economic of Shandong Province is rude, and mainly bases on investment and resource exploitation, so the establishment and optimization of industrial policy is what we should resolve urgently.

424. (Paper)

**Environmental Impact Assessment in Peacekeeping Missions- Challenges and Opportunities**

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Military peacekeeping operations in post conflict  
regions face different challenges, one of them being  
the need for adjustment in mission planning to  
ensure that the operation will strengthen, not  
hamper, the often fragile environment in the host  
nation.

In a cooperation between United Nations  
Department of Peacekeeping Operations  
(UNDPKO) and Sweden, operative tools for  
managing environmental issues in UN deployments  
have been suggested. The bases for the  
cooperation were the recently developed UN  
Environmental Policy and Environmental Guidelines.

Efforts to develop a generic template for a  
practicable "Peacekeeping Environmental  
Assessment" have been made. For doing that, the  
more traditional methodologies for Environmental  
Impact Assessment (EIA), Rapid Environmental  
Assessment (REA) and Strategic Environmental  
Assessment (SEA) were studied. In order to assess  
the possibility for implementation in the field, United  
Nations Mission in Sudan (UNMIS) was selected for  
a pilot study, which included a fact finding trip. A  
vital tool for presenting and communicating the  
results has been Geographical Information Systems  
(GIS).

The overall results from this work will hopefully be  
implemented in UN future work in this area.

583. (Poster)

#### **EIA and SEA Training Programmes**

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The poster presents Ramboll Natura's experiences  
with EIA/SEA Training Programmes as a tool for  
EIA/SEA capacity building in developing countries.  
The programmes have been conducted since 1998,  
and are financed by the Swedish International  
Development Cooperation Agency (Sida). Ramboll  
Natura develops and implements:

- Global training Programmes on EIA/SEA;
- Bilateral Training Programmes for China, in  
collaboration with the Chinese State  
Environmental Protection Administration  
(SEPA);
- Regional Training Programmes for South  
Eastern Europe, in collaboration with the  
Regional Environmental Center for Central  
and Eastern Europe (REC).

The poster focuses on:

- Training Programmes as a tool for  
EIA/SEA capacity building (approaches,  
contents, participants, networking)
- Examples of post-training activities and  
results, internationally and in China.

581. (Poster)

#### **EIA and SEA Capacity Building in Developing Countries**

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The poster presents Ramboll Natura's experiences  
from development cooperation within the natural  
resource sector and institutional capacity building,  
with focus on EIA and SEA capacity building in  
developing countries. Ramboll Natura carries out  
EIA and SEA capacity building both at the global,  
regional and local level. Services include:  
Development of EIA/SEA Guidelines; Legislation;  
Human Resource Development and Training; and  
support to the implementation of EIA/SEA,  
monitoring and auditing and review of EIAs. The  
poster will highlight the following examples of  
programmes and projects:

- Advanced International Training  
Programmes on EIA and SEA, since 1998,  
sponsored by the Swedish International  
Development Cooperation Agency (Sida)  
GLOBAL (for EIA/SEA professionals from  
Asia, Africa, Latin America and South  
Eastern Europe), REGIONAL for South  
Eastern Europe and BILATERAL for China;
- Vietnam: Strengthening Environmental  
Management and Land Administration  
(SEMLA) – Improved capacity at national,  
provincial and local levels to address  
pollution and other environmental issues  
and to provide efficient land administration  
services;
- Laos: Strengthening Environmental  
Management – Building of central and local  
institutional capacity, improvement of  
environmental data collection and  
management, and integration of  
environmental management in planning for  
sustainable development;
- Tanzania: District Development  
Programme (DDP) – Build the capacity of  
the local administrative structures.

568. (Paper)

#### **The World Bank's Pilot Program on Institutions- Centered SEA**

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Institutions-centered SEA is an approach to incorporate environmental and social considerations in policy and sector reform. The SEA task team of the OECD DAC, the World Bank and other institutions have generated knowledge that indicates that influencing policy for sustainability and equity requires a much more thorough understanding of political economy factors and institutional settings. This approach recognizes that benefits and costs of policies and sector reforms, particularly environmental and social costs, are usually externalized to vulnerable stakeholders affecting society at large. Consequently, it emphasizes the need for giving voice and influence in policy making to weak and vulnerable stakeholders through enhancing transparency, public participation, accountability and social learning. To test this approach the World Bank has established a pilot program that provides grants in selected sectors, countries and regions in which the Bank is operating. Along with supporting client countries' efforts to achieve sustainable development, the program's objective is to draw lessons from these pilots on methods and processes for effective I-SEA. In this presentation the main features of the program will be analyzed and preliminary results will be discussed.

335. (Paper)

**Assessing Community Views About Mining Town Developments Using the Choice Modelling Technique**

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Two SIA studies of Queensland's Coppabella coal mine were undertaken in 2002/03 and 2006/07; the period between studies coinciding with a boom in world coal prices and the development of several more mines in the immediate area. The first study found that after four years of operation Coppabella had generated significant changes in the surrounding, predominantly rural, communities. While some changes were regarded by long-term residents as desirable, the community was failing to realise economic development and diversification opportunities that had been expected to accompany mining. Employment was increasingly concentrated in mining as availability and affordability of housing in the area declined. Labour shortages were experienced in other industries along with a net loss of women and children from the community. Education levels were low. Jobs were concentrated in the semi-skilled and unskilled categories. A lack

of services placed constraints on the quality of life of residents and ability of the area to attract investment and residents. Overall, the capacity of the community to deal with any downturn in mining would be limited. Continued mining development has placed additional pressures on existing services and increased the exposure of residents to criminal and anti-social behaviour.

788. (Paper)

**Environmental and Social Risk Management at Citi**

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Citi's Environmental and Social Risk Management (ESRM) Policy was designed to effectively manage environmental and social risks related to transactions where the use of proceeds is known. The Policy provides a framework to ensure that Citi finances projects that are complying with international environmental and social standards. The ESRM Unit, which is led by a director and includes a vice president and analyst, serves as a technical resource and counsel for Senior Credit Officers and is responsible for review, advice, and consultation on new transactions across the Corporate and Investment Bank. To ensure that projects in the emerging markets comply with IFC and World Bank standards, the ESRM Unit may provide the following technical assistance to bankers: Stage 1 (Greenlight/Marketing) – Advise bankers on screening and categorization of transactions and the incorporation of environmental and social requirements in the term sheet; Stage 2 (Due Diligence) – Prepare a scope of work for Environmental Impact Assessments; Review Environmental Impact Assessments and assist in the preparation of an Action Plan to meet the IFC and World Bank standards; Stage 3 (Credit Approval) – Advise bankers on the incorporation of appropriate representations, warranties, and covenants to be included in the loan documentation.

251. (Poster)

**Economic and Environmental Impacts of Rural Electrification Using Household Photovoltaic Systems in Brazil**

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Coelba has installed PSE in 5,500 homes and another 25,000 will be connected by 2008. These users are registered and receive monthly electricity bills. This is a significant step in the history of rural electrification in Brazil as it represents a break from the prevailing paradigm. For the first time an electricity distribution company has taken on board solar photovoltaic technology in its planning for the universalization of electricity in its area.

The state of Bahia covers 567,000 km<sup>2</sup> and in 2002 there were approximately 430,000 rural households in the state without electricity.

Recent legislation in Brazil obliges concessionaries to universalize the public service of electricity supply. This is a very costly business given that most of the market which has not been reached is found in rural areas where the costs of conventional service supply are high due to the greater distances the networks have to cover, the wider distribution of the consumers and the low consumption profile of the users.

Coelba has chosen photovoltaic solar energy (PSE) as an environmental and economical alternative solution and proposed its use on a large scale. A research carried out by the University of Salvador in 2003 demonstrated that most of the clients provided with this type of energy were very satisfied.

The environmental impacts of this type of energy are very small as there is no need to construct networks, the native vegetation is preserved and the contractor takes just 4 hours to install it. Studies also carried out by UNIFACS calculate that the installation of 9000 systems in Bahia would reduce the annual CO<sub>2</sub> equivalent of 26,000 tonnes.

230. (Paper)

**Non-Land Use Planning in Sub-Saharan Africa: Kenya- Solutions and Incentives To Government Responsibility**

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My particular interest is in the issue of correcting non land use planning in Sub Saharan Africa. This is a robust forum for in depth, tried and tested and state of the art knowledge from researchers and practitioners. Intended outcomes include chiefly to ignite sharper focus and a sense of urgency to all stakeholders on the issue of non land use planning, particularly in Sub Saharan Africa.

One of the most visible problems in Sub-saharan Africa is the widespread unplanned developments. Haphazard, substandard developments present huge obstacles to improvement goals in economic and social terms. Structures and entrepreneurial processes that were commenced without regard to their environmental and developmental sustainability exemplify non-land-use planning. Achieving

improved standards of living requires correcting unsound developments. Cross-examination of government development plans and efforts in one case study, Kenya, does not indicate recognition of the problem, especially for urban areas.

The paper focuses first on the definition of non-land use planning and non-land use planning correction; second, on persuading governments to acknowledge and own the problem; then, research focuses on interesting Sub-Saharan governments, overwhelmed by higher priority issues, to turn serious attention to land use planning. Finally, the study suggests a lucid description to governments, of the problem, answers on incentives to governments plus benefits of land-use planning, and suggestions of frameworks for action and implementation time plans for.

This paper spotlights government responsibility in sustainable development, particularly in land use planning, and describes and discusses these challenges and their background. Solutions emphasize responsibility for correction and roles for different interested parties.

603. (Paper)

**Involving Canada's Indigenous Peoples in Environmental Assessment: Co-management through the Mackenzie Valley Environmental Impact Review Board**

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A few decades ago, the Indigenous peoples of Canada's Northern territories had virtually no say when government or industry proposed major developments, such as roads, pipelines and mines. Even when government began to take environmental assessment seriously (in the 1970s), Indigenous people had a limited role in the decision-making process. With the settling of 'comprehensive land claims agreements', which have the status of modern treaties, and the accompanying attitudinal shifts by government, industry and the public, Indigenous peoples now play a major role in EA processes applied to proposed developments in the Canadian North.

This paper explores the participation of the Indigenous peoples of the Northwest Territories in the EA activities of a co-management board

established via land claims, the Mackenzie Valley Environmental Impact Review Board. Following a brief overview, the paper focuses on three aspects of the Board's work: its nature as a co-management board, with guaranteed representation of Indigenous people on the Board; its wide-ranging community consultation processes; and its efforts at integrating the 'Traditional Knowledge' of Indigenous peoples into its operations and decisions. The paper concludes with an assessment of the Board's accomplishments and the challenges before it.

315. (Poster)

**Improving EIA System for Harbor Developments in Korea**

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This study aims to identify what is to be considered when preparing and reviewing EIA in planning fishing port and harbor development projects in Korea. It is analyzed in four parts.

The first part investigates what goes on upper level and lower level planning because they directly relate to which site for fishing port or harbor development is to be developed and to be managed. The second part explores regulations such as zoning ordinance and its specifics. Zoning ordinance has been recognized as a way to limit project development in said areas vulnerable to harmful environmental impacts. Third, the study examines what procedures guide fishing port and harbor development and what is to be done and to be considered in those procedures. Lastly, it reviews and analyzes previous reviews and comments produced from overseeing environmental impact assessment reports. Particularly, it pays attention to majors issues and proposals for their solutions in marine environment sections within environmental impact assessment reviews.

738. (Paper)

**Impact Assessment in Italy: An Overview on Regulation, Policy and Perspective**

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The paper describes the impact assessment situation in Italy after the application of SEA EU Directive and focuses on different regional application of SEA. IAIA Italia has been working since May 2006 on creating a national network for best practices in order to help risk assessors and environmental managers to adopt relevant IAIA methodologies. The Italian Government is been involved at different institutional levels for coordinate new methodologies and IAIA Italia has organized a national workshop for asking to regional and local players to promote a network by which transfer experiences in SEA and EIA in Italy.

Presented in the paper: (1) the actual Italian situation in last 10 years in EIA; (2) the critical elements in working with new EU regulations; (3) the perception of IAIA opportunities in Italian institutional and private players; (4) the IAIA Italia network project for best practices and methodologies.

743. (Paper)

**Quantifying Cumulative Impact Assessment with Dynamic Computational G.I.S. System in a Multi-Stressor Area: A Case Study on a Waste Treatment Plant in Italy**

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The paper introduces a new methodology for studying cumulative effects. The methodology is applied to a case of air emissions produced in an industrial area with several stressors environmental components. A formal definition of a site conceptual model is presented and a real case study is analyzed using Dynamic Computational G.I.S. (DCGIS) and landscape ecology. Air stressor matrixes are generated by different diffusion models and implemented on DCGIS software tool in order to evaluate concentrations and exposure for each specific pollutant emission. The health of the system and the sensitivity of components are defined using landscape ecology and thermodynamical indices

(energy, exergy, Biological Territorial Capacity Index). Different scenarios can be obtained from a selection of time function emission and physical conditions allowing sensitivity analysis on several parameters of the system.

740. (Paper)

**Quantifying Impact Assessment with G.I.S. Systems: A New Methodology**

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A new methodology for characterize dynamic stressor elements in SEA and EIA with G.I.S. tools is presented. The methodology is based on multi dimensional stressor analysis in phase space and several EPA official software are used to set input stressor maps-matrixes; the assessed area is characterized in a grid-matrix frame and set stressor maps-matrixes are dynamically implemented by the system which elaborate multi-level risk maps for any specific correlation frame.

The conceptual model is based on multi dimensional vector spaces of interaction and each stressor element is characterized as a linear combination of several orthogonal "base vectors" describing specific environmental pressure. These dynamic stressors components interacting with all vulnerability levels and produce numerical reports and G.I.S. maps. The computational tool can be set for Monte Carlo analysis and producing comparative risk maps useful for dynamic decision making in planning processes especially for Strategic Environmental Assessment.

The presentation will focus on general procedure to set impact assessment in a Stressor-Vulnerability Interaction frame using G.I.S. and stressor characterization process: the operative definition of dynamic pressure state vector for specific kind of stressor element on G.I.S.

112. (Poster)

**Balancing of Energy Production, Biodiversity, and Ecosystem for Hydropower Production – A Case Study Lower Kihansi Hydropower Project (Lkhp) In Tanzania East Africa**

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Some mitigation measures taken include:

- By pass releasing of 1.5m<sup>3</sup>/s from reservoir, which is equivalent to 15MW
- Constructions of sprinkler systems to compensate for the natural spray - cost 1M US\$
- Establishment of The Lower Kihansi Environmental Management Project (LKEMP) to oversee environmental efforts and to identify and recommend future mitigation process and targets.

The Lower Kihansi Hydropower Project (LKHP 180MW) is constructed in the Kihansi River and runs through the Eastern Arc Mountains along the eastern escarpment of southern Udzungwa Mountains (biodiversity areas) and have cascades of gorges which are approximately 4 km long with waterfalls that sustain a unique microclimate of spray wetland. The LKHP incorporates a 25 m high dam, which diverts water to an underground power generating station returning water to the river about 6km downstream.

The environmental impact assessment process of any hydropower project is a key element of sustainability emphasizing fully informed decision-making.

This paper presents the importance of undertaking a comprehensive ESIA of hydropower project before the construction in order to balance the energy production, biodiversity and ecosystem. It describes the mitigation measures taken after the construction to reduce the environmental impacts mostly on the biodiversity and ecosystem at the gorge and at the same time ensure sustainable power production.

250. (Paper)

**How an Electrical Distribution Company in Brazil Is Reducing Enviromental Impact By Means of EMS**

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A 29 minute video showing all the main environmental care to be taken during the activities chosen at the EMS has been done to strengthen and facilitate the training of all the employees and contractors involved with the Environmental Management System. A version with english legend is available as well as a summary of the video with 9 minutes duration, to be shown during outside presentations.

COELBA is a private electricity company serving the state of Bahia, supplying 4 million clients in 567,000 km<sup>2</sup>. To maintain quality service provision for all clients, it counts on its own 2,721 staff and 8,766 outsourced. In 2003 the company investigated the activities which caused most environmental impact and found that these included tree pruning, line circuits construction and cleaning of right-of-ways. In 2004 an Environmental Management System (EMS) based on that of ISO 14001 was implanted.

Specialized advice was sought and a member of COELBA's staff was chosen to coordinate the work. The support of management was fundamental as the EMS implies significant changes in the working practices that had prevailed for the last 40 years which had failed to take into account the environmental impacts caused. Another important point was the involvement of the employees in the definition of the procedures.

In terms of main results we can mention the elaboration of an Environmental Management Manual containing 20 procedures related to the management of atmospheric emissions, chemical products, solid residues, sound pollution, management of fauna and flora; training of staff involved in the Ecological Education course for awareness-raising for environmental issues;

527. (Paper)

#### **Alternatives and Assessment in Large-scale Projects – The Öresund Bridge Case**

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The Öresund bridge between Malmö (Sweden) and Copenhagen (Denmark) is a contested large-scale infrastructure project with significant strategic impacts in a number of fields ranging from transport and regional policy to taxation and welfare issues. A case study focusing on the bridge's long decision-making history, and especially on the handling of alternatives in decision-making and impact assessment, shows that the 'reasonable alternatives' and environmental concerns have changed over time. Several reasons for this can be identified, including: the role and purpose of urban and land-use planning, the perception of 'the environment,' the role of experts and the public, and (not least) the question of what the purpose of the bridge was.

Large-scale projects can often be seen as creating a wider context for further planning and development. Should these contextualizing decisions therefore be treated as (EIA) projects or (SEA) plans? How alternatives are handled in a meaningful way in impact assessment is dependent on whether the approach taken is that of the project (EIA) approach, or the planning (SEA) approach. How these factors are treated in an assessment process will also have wider implications for the effectiveness and outcome of the assessment.

744. (Paper)

#### **Integrating Multiscale Impacts in Megaprojects Assessment: Philosophy, Methodologies and Practical Issues**

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Integrated assessment is an analytical approach that knits together knowledge from a variety of disciplines to gain an understanding of the impacts of megaprojects. Bent Flyvbjerg's defines megaprojects as multi-billion dollar megainfrastructure project. The physical and economic scale of today's megaprojects is such that whole nations may be affected in both the medium and long term by the success or failure of just a single project. The analysis emphasizes the weaknesses of the conventional approach to megaproject development: EIA, EIS and methodology such as cost-benefit analyses, financial analyses and environmental and social impact statements that are routinely carried out as part of megaproject preparation severely miscalculating all the effects. In megaprojects context, integrated assessments provide a framework to examine how a big infrastructure might affect natural, unmanaged and human-built systems and how these effects might carry over into the

economic sector. In this framework we show that the Flyberg's Machiavellian formula for approval ((underestimated costs) +(overestimated revenues) + (undervalued environmental impacts) + (overvalued economic development effects) =(project approval)) can be dropped using a multiscale integrated method based on sustainability index as ecological footprint, landscape science, thermodynamical indicators as emergy, and cumulative impacts assessment.

601. (Paper)

**Measuring Environmental Impact: The Use and Viability of the CV Method in the Case of Mexico**

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This paper is on the use of Contingent Valuation Method (CVM) in the case of water resources in Mexico. Policy design for management of environmental resources has to consider the inclusion of the three basic principles of Sustainability, Precautionary and Polluters Pays Principle (PPP). In order to accomplish these principles, the resources managed under these policies have to be assessed in a form these reflect their real value.

CVM is based on the assumptions that a) markets tend to work efficiently, and b) consumer surplus can be measured for non-tradable, public goods, such as clean water. In this case, CVM is used in the Mexican context applied to the measure of three goods, automobiles – a luxury good - corn tortillas - a basic food staple, and water, which is perceived as a scarce but under priced, life-sustaining good. The performance of the technique is compared on the former two goods and, given these outcomes it is applied on the water market. Therefore, it could be possible to determine the effectiveness of the method in relation to the performance of these markets, as well as if these results could be used efficiently on the design of the water resources management policy

534. (Poster)

**The Dutch Partners for Roads Programme and EIA/Transportation Centre: Exchange of Know-How and Enhancing Quality in Infrastructure Planning**

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The Partners for Roads Programme (PfR) is an initiative in the field of road infrastructure of the Dutch Ministry of Transport – in cooperation with Road Authorities in Central and Eastern Europe. The Programme concerns the exchange of know-how and experiences. PfR was started in 2001 and has developed into a technical assistance programme with a time horizon that stretches to 2010.

Roads & Regional Development is a Window within the Programme and aims at mainstreaming economy and environment in the road planning process. The Window addresses three modules: economy, environment (focusing on SEA and EIA) and cooperation (focusing on stakeholders involvement and public participation). Activities include seminars/workshops, assistance programmes, expert visits, conferences and cooperation projects. The lessons learned are gathered in a (web-based) toolkit.

The EIA/Transportation Centre is also part of the Ministry of Transport and aims at enhancing the quality of the planning and EIA process for road infrastructure. Objective is to achieve careful planning and decision-making for infrastructure projects. The Centre gives advice, carries out studies and evaluations for the various divisions within the Ministry. The Centre focuses on three groups of activities: knowledge development, knowledge transfer and advice on a project basis.

536. (Poster)

**Stakeholder Involvement and Public Participation in the Road Planning Process: European Examples Derived from the Dutch Partners for Roads Programme**

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From the PfR Programme, two cases of infrastructure planning are selected. These are typical examples of road planning processes in which stakeholder involvement is essential for successful decision-making. The cases are compared and general lessons shared, which are appropriate for road planning projects in different settings and national contexts.

The N18/Achterhoek in the Eastern part of the Netherlands is a pilot project for a new form of public involvement in the road planning and EIA process, entitled "public participation new style." A clear participation model has been designed in which stakeholders are to varying degrees involved in the process. The poster presents the case study, participation model and main lessons learned.

The E22/Eastern Entrance – the connection of the E22 to the eastern part of Riga, Latvia – is one of the first highways to be developed in Latvia, in a rapidly expanding part of Riga. Spatial planning is organized bottom-up in Latvia making the local municipalities vital, deciding stakeholders. This requires an important stakeholder involvement process, also including local inhabitants. The poster presents the case study and main lessons.

407. (Paper)

#### **Ethics of HIA**

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Health Impact Assessment involves several ethical principles, such as solidarity, equity, democracy, sustainability, etc. While these principles are routinely referred to in training or textbooks in HIA, their use and relevance is not fully spelled out. Yet, it may be that adherence to some of these principles is a key feature that characterises HIA; for example, the chronic apparent irreconcilability of HIA and risk assessment may lie in the conflict of the underlying ethical frameworks, essentially deontological and utilitarian, respectively.

Clarification of ethical principles and how they are used in various circumstances can potentially be useful for more awareness of HIA's rationale; enhanced communication with stakeholders in HIA exercises; better dialogue with related disciplines and communities, notably in strategic assessments; addressing HIA's shortcoming and difficulties with implementation in certain settings; strengthening HIA's methodology.

Although the same process of clarification has the potential of damaging HIA, by overstating some of its limitations, the possible benefits outlined above should encourage a more open debate on ethics in HIA and impact assessment. Similarly, differences in ethical principles markedly set apart areas such as EIA and SIA, hence it is thought that IAIA as a whole can benefit from this debate.

641. (Paper)

#### **EIA as Planning Tool and Its Effectiveness in Rwanda**

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Rwanda has recently adopted EIA as tool of planning. In the course of that, it has, however, encountered a variety of challenges related to EIA development that need to be addressed. The paper will focus on issues related to EIA process in Rwanda such as screening, scoping, quality of (EIA), inadequate expertise and experience, limited lack of public participation, inadequate private-public partnership, public awareness, decision making and appeal procedures, inadequate and unreliable data as well as lack of human and financial capacities.

The paper also highlights a range of measures to address the issues above including lack of ownerning EIA, compliance with international agreements, application of EIA as tool for planning at national and local levels, environmental service fund, encouraging public awareness to demystify EIA process. It identifies a range of opportunities to strengthen the EIA process in Rwanda, private-public partnership, environmental audits, and the need of building capacity of EIA practitioners.

The paper also stresses the importance of hinging effectiveness of the EIA process in Rwanda to the existing political will in the country.

370. (Paper)

#### **Integrating Environmental and Biodiversity Concerns in Development Planning through Enabling Policy and Regulatory Framework**

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The key environmental challenges faced by any developing country invariably relate to the nexus of environmental degradation with poverty and economic growth. These challenges are intrinsically connected with the state of environmental resources. In order to address the conflicting issues of conservation and development in a more meaningful way, India has formulated in 2006 a forward looking National Environmental Policy (NEP). The NEP emphasizes that for a development to be truly sustainable ecological thresholds must be respected. It provides enabling guidance for mainstreaming environment and biodiversity concerns in economic developments in all sectors. It has also enunciated 14 principles that have an established genealogy in policy pronouncements, jurisprudence and international environmental law.

The paper discusses the positive influence of these principles on development related decisions and describes the regulatory framework that is being developed for management of 'Entities of Incomparable Value (EIV)'. Based on the policy directives, the EIVs sites recognized for their unique conservation values would not be 'opened' for developments nor would be 'jeopardized' by in-kind or cash compensations, determined by the classical cost benefit analyses. The implementation of NEP and the regulatory framework for managing EIVs would go a long way in harmonizing conservation and development.

362. (Paper)

**Public Participation in Wastewater Treatment Planning in Thailand—Experimental Stakeholders' Meeting in Amphawa District**

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This study aims to compare the advantages and disadvantages of public participation style for wastewater treatment planning and its SEA, and to clarify the key points of effective public participating meetings. To clarify how detailed data should be presented to participants and what points are the distinctive significance of SEA and participation in Thailand is also the objectives of this research.

To achieve these objectives, two kinds of experimental stakeholders' meetings were held in Amphawa District. One was the meeting at the later stage which was held only once. Alternatives to treat wastewater and their effects on cleaning water in canal network were prepared beforehand, and stakeholders discussed which alternative plan was more preferable. The other was the meetings held at two steps. In the first meeting, the alternatives to treat wastewater were explained and stakeholders prepared the alternatives based on their discussion. In the second meeting, the stakeholders discussed the most preferable alternative based on environmental assessment for each alternative prepared by the academic researchers. The participants' preference for the style of meeting style and effectiveness of discussion were analyzed based on these experimental meetings.

179. (Paper)

**Cooperate Stewardship in Conservation through Impact Assessment: The Case of Grumeti Reserves Limited in Serengeti, Tanzania**

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Grumeti Reserves Limited, a private hunting company operating in Serengeti - Tanzania is pioneering the development of high-class tourism that takes environmental conservation as focus of development. The Company operates two hunting blocks and has evolved a development concept that integrates social- economic development of the local community and improved tourism development that has boosted tourism in the area. The company operates an exclusive five star lodge in Serengeti. In efforts to conserve the biodiversity of the area, the company has re-introduced black rhino after conducting an EIA. The company has stopped hunting in its hunting blocks in order to raise the value of biodiversity and hunting trophies whilst paying all the required hunting fees.

The Company has commissioned several Impact Assessments of its proposed development concept that will inevitably change the tourism landscape of Serengeti, making it a hub of tourism in Tanzania and Africa.

This paper explores the experiences Grumeti Reserves has gone through in promoting tourism and conservation and highlight some of the best practices, lessons learnt for cooperate stewardship in conservation.

526. (Paper)

**Ecological Assessment and Habitat Classification of the Korean Demilitarized Zone Corridor: A Geospatial Approach**

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Important trans-boundary issues include water and habitat resources, human dimension dynamics and food and security patterns. All benefit from detailed and up-to-date inventory and monitoring systems supported by digital geospatial systems. The DMZ peace park program in Korea, where field work is especially challenging, is quite dependent upon remotely sensed data for developing this *de facto* sanctuary for wildlife and habitat for Korea's unique native biodiversity. Satellite and model outputs can be used to establish detailed ecological baselines as well as changes within the regions systems. The temperate deciduous and mixed forests within the Korean peninsula lend themselves well to detailed map unit delineation. Strong seasonal vegetation patterns increase the information signal available within multi-seasonal (phenologically based) imagery. Add terrain, soils, biophysical, hydrological and human dynamics information and effective depictions of habitats as well as system threats can be mapped. This presentation will overview integrated trans-boundary process mapping, taken from CIESIN's projects in: Environmental Treaties and Resource Indicators (ENTRI), Last of the Wild, Global Distribution of Poverty Mapping and the Environmental Sustainability Index (ESI). Case studies from Brazil\Uruguay, Africa and Sri Lanka will be presented, together with outlines of data systems for the Korean DMZ project.

347. (Paper)

**The Experience of Developing the Methodical Provision for Conducting Strategic Environmental Assessment in the Republic of Belarus**

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The main question for our Republic today is the integration of SEA in the process of decision making of the documents of "high" level. I have developed the methodical recommendations about SEA. I am going to tell about my own experience in developing of methodological recommendations and how we

can cope with the problems and about conducting SEA in our country.

I hope to learn about the methods and methodology of conducting of SEA in other countries. I am planning to participate in the process of SEA actively as an expert of environmental assessment, to work in the projects of SEA, to participate in the seminars of SEA that our Ministry of natural resources and international organizations conduct. This knowledge will be very useful for me as a lecturer in our University.

366. (Paper)

**Socioeconomic Impact of Urbanisation on Indigeous People of Urban areas: Case Study of Rebisi People of Port Harcourt City, Nigeria**

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Urbanisation, which simply defined is the increase in the number of people living in urban areas, is a major feature of most countries of the developing world in recent times. Against this backdrop, many researches have arisen on the impact of urbanisation. Nevertheless, most of these researches have focused on its impact on the biophysical environment and a few on the socioeconomic impact. Even with the research on socioeconomic impact, little is heard on urbanisation impact on the indigenous people. This study hopes to bridge the gap using the Rebisi people and Ibibio of Port Harcourt & Calabar cities of Nigeria as case studies. It is postulated that urbanisation of the cities has not improved the native people's socio-economic life. Also, urban planning has not considered the plight of the indigenous people who are being swallowed up in the urbanisation process.

367. (Paper)

**Human Density, Industrialisation and Economic Growth in the Niger Delta,Nigeria: An Assessment of Their Impact on the Mangrove (Forest) Resources**

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The mangrove forest of the Niger Delta region of Nigeria holds great and valuable resources (mineral and biological), which are major sustainers of life and economic growth of the entire country. It is also a truism that the people of the Niger Delta traditionally depend on these mangroves for their life support, but the increasing human population and as well as industrialization and the quest for economic growth have posed serious threat to the sustenance of this great resource and has called for concern. This paper therefore assesses the impact of these factors on the mangrove ecosystems of the



Niger Delta region. Through field investigation, the study discovered a steady loss of the mangrove at the rate of 5.8% annually, with oil exploration & exploitation accounting for 61.7% of the total losses. Therefore, serious re-vegetation is suggested as the panacea or strategy for sustaining the resource potentials of the mangroves.

446. (Paper)

**Experiences from Introducing Changes and Improvements within Post-EIA Monitoring in Seven Asian Countries (India, Malaysia, Mongolia, Pakistan, the Philippines, Sri Lanka and Vietnam)**

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Ramboll Natura has organized an Advanced International Training Programme on EIA and SEA 1998 - 2006, financed by the Swedish International Development Cooperation Agency (Sida). The majority of the participants in the training programmes are decision-makers and specialists in environmental authorities and environmental organizations, as well as planners and managers in

environmental divisions within central or local authorities, and sector ministries or organizations. During the International EIA and SEA Training Programmes each participant developed individual change projects, aiming at improving the EIA/SEA system within their respective countries. The actual authors/presenters will be 5 - 10 Asian participants in International Training Programme, who prior to the Conference will meet in a Follow-up Workshop in Vietnam, May 28 - June 2, 2007. One of the objectives of the Follow-up Workshop is to exchange experience relating to the participants' "change projects" and institutional change processes in general. The Workshop will also deal with, e.g., how networking can be used for facilitating improvements related to EIA/SEA within the participants' respective organizations. The purpose of the paper is to show and discuss experiences in 3 - 6 different Asian countries from introducing changes and improvements of the EIA/SEA systems.

193. (Paper)

**Role of Social Impact Assessment (SIA) in Development of Special Economic Zone (SEZs), an Indian Perspective**

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The government of India has introduced Special Economic Zone (SEZ) policy with a view to provide an internationally competitive and hassle free business environment. Development of SEZ involves acquisition of several hectares of land at a stretch for multiproduct/sectoral industries with supporting commercial and residential establishments. Acquisition of land triggers a cascade of social and environmental consequences. It must be ensured that development of SEZs are both socially and environmentally sustainable. Therefore, comprehensive study on Social Impact Assessment (SIA) besides, Environmental Impact Assessment is required to support decision making process.

SIA is a process of identifying, predicting, evaluating and mitigating the social and other relevant impacts of developmental activities to obtain social acceptance for the proposed project. Thus, the main objectives of SIA in development of SEZs are to prepare demographic and growth profiles of the population under land acquisition, assessment of economic benefits to community and environment

due proposed developmental activities and projection of anticipated changes with quality of life parameters to evolve pragmatic Rehabilitation Action Plan (RAP) for the Project Affected Persons (PAPs) under focus.

This paper is an attempt on highlighting the role of Social Impact Assessment in development of SEZs in the Indian context.

613. (Poster)

**Korean Emission Inventory Processing for Air Quality Assessment**

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In order to properly estimate changes in air quality associated to national, regional, urban, and local development plans and to correctly explain the source-receptor relationship as of now, it is required to prepare the most updated inputs to air quality modeling assessment or prediction. To predict impacts of secondary air pollutants such as ozone or particular matter on local air quality in Preliminary Environmental Review System (PERS) and Environmental Impact Assessment (EIA), it needs to predict three-dimensional meteorological field of the local area, and, by using its result that, in turn, helps calculate emissions amounts and build a photochemical reaction model to predict their influences on air quality.

We have proposed to develop the Korea Environment Institute-Emissions Inventory Preparation System (KEI-EIPS) to generate air quality model-ready emissions data with SMOKE using the MOE's emissions inventory data, maintained under the Clean Air Policy Support System (CAPSS) database.

381. (Paper)

**Improving Data Usability for Effective Environmental Indicators in Strategic Environmental Assessment**

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Article 10(2) of the Strategic Environmental Assessment (SEA) Directive (2001/42/EC) recommends the use of existing monitoring data where possible to demonstrate likely significant

environmental impacts. In order to ensure the successful use of environmental indicators, barrier-free access to relevant and suitably geospatially and temporally scaled environmental datasets is crucial. Environmental reports often identify and highlight data gaps but fail to explain their existence or to make suggestions as to how the gaps may be filled. In the case of many environmental data providers data is frequently offered at restricted geographical scales, with high levels of aggregation, and/or with significant temporal lags. While "no data is better than poor data" data providers should understand the advantages to the user community of barrier-free access to "good data." Much international effort is focussed on the application of environmental indicators for SEA. Data issues occurring during indicator development should be flagged and used to inform data providers on how to develop more user-friendly data access systems. This paper will highlight a number of recommendations to (a) assist users assessing and using available data and (b) assist data providers to better understand the needs of their user communities.

151. (Paper)

**Evolution and Evaluation of the EIA System in Iran**

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Iran is a vast country with diverse climatic and environmental conditions, hence a habitat for a rich diversity of terrestrial and marine species. The natural characteristics of the country explain the concern for better environmental protection plans and activities in Iran. The environmental protection activities started with the establishment of the Hunting and Fishing Organization in 1967, which was renamed the Department of the Environment (DoE) in 1972.

During the past decades, great pressure has been put on environmental resources due to unsustainable development patterns. Environmental Impact Assessment (EIA) plays a key role in achieving goals of sustainable development. The legal basis for EIA in Iran is Note 82 of the Law of the 2nd Development Plan from 1994. This paper discusses the history of and current environmental laws in Iran and presents an evaluation of the current state of EIA. The main problems highlighted are lack of clarity in the legal definition of the contents of EIA, lack of clear screening to reach primary or full EIA, lack of consideration of alternatives and effective public participation, and a weak procedural basis to analyze EIA data. Also, recommendations are made for improving the effectiveness of the EIA process.

550. (Paper)

**EIA Decision-Making and Natural Justice**

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What is necessary to ensure natural justice in EIA decision-making? The concept of natural justice (or procedural fairness) extends a duty to decision-makers to involve affected stakeholders in approval decision-making through meaningful consultation and participation. But what happens (or should happen) when new information enters the final approval decision-making process that affects the approval outcome? Should proponents and public stakeholders be privy to this information before the final (political level) decision is made? We review international EIA procedures and legal cases. Natural justice typically is not something that is prescribed in law but emerges from practice and customs. Decision-making by elected ministers is generally less transparent than that by government agencies, and expectations concerning natural justice vary accordingly. Balance has to be struck between efficiency of process and provision of endless opportunity for public participation in decision-making – provision of appeal rights along with full disclosure of the reasons behind a decision are important here. Ultimately decision-makers must judge when and how much information should be disclosed to stakeholders on a case by case basis, realising however, that a fair process will likely to lead to the best outcome in the most efficient way.

572. (Paper)

**Transboundary Impact Assessment for Member Countries in the Lower Mekong Basin**

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Cambodia, Laos, Thailand and Vietnam share the Lower Mekong River Basin (LMB) and its resources. The Mekong is a transboundary river in nature. The "1995 Agreement on the cooperation for the sustainable development of the Mekong River Basin" was signed by the four countries to cooperate in the development, utilization, conservation and management of the basin's water and related resources.

Sustainable water resources development in the LMB provides opportunity to alleviate poverty in different ways. Occasionally, the past experiences on water resource management have showed that development in one country has caused significant impacts to the neighboring countries. In 2002, MRC initiated an EIA/SEA system to minimize potential

impacts at policy, plan and programme (PPP) level and is being drafted a transboundary environmental impact assessment guidelines (TbEIA) to minimize the potential impacts at project level.

The purposes of this paper are to provide an overview of MRC cooperation framework and discusses MRC's EIA/SEA system and the proposed TbEIA to facilitate and support potentially transboundary environmental impacts at both PPP, and project level respectively. In addition, it highlights some of the challenges for supporting member countries to effectively implement the EIA/SEA system and TbEIA.

247. (Paper)

**Environmental Impact Assessment Legislation in Uganda**

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This paper will a) discuss the development of EIA legislation in Uganda. Given Uganda's development objectives, the "economic development context" within which the EIA legislation operates cannot be ignored and this will form the way in which the legislation is evaluated; and b) examine the shortcomings of the current system and suggest recommendations to address the identified problems.

Uganda has had legislation requiring environmental impact assessments from only as recently as 1998, in the form of regulations promulgated under the Environment Act, 1995. The introduction of compulsory environmental assessment for those activities identified in the legislation was an important step forward and brought Uganda into line with international practice. However, since the legislation has been in place, several shortcomings of the legislated EIA process have manifested themselves, including issues relating to, *Inter alia*:

- a) The capacity of competent government departments to implement the EIA legislation effectively
- b) The identification of activities requiring EIA
- c) Effect of political interference in the EIA process;
- d) Public participation in the EIA process; and
- e) The duration of the EIA process;

Before 1995 when the Environment Act was enacted, Uganda lacked a framework piece of legislation to coordinate environmental issues. The enactment of this Act together with the promulgation of the Constitution in 1995 have since closed this gap in the law. The Act provides for the making of EIA regulations. These regulations were promulgated in 1998 and are now law. However, the current EIA process/practice has several flaws as highlighted above which need to be addressed.

702. (Paper)

**A Study on the Fate of the Pollutant in Transitional Zones of Lake Juam**

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Lake Juam supplies drinking water for 2.5 million people in Gwangju City and Cheonnam Province. Even though the water quality of Lake Juam consistently maintains good status since dam construction, algae bloom seasonally occurs in large scale in the transitional zone of Lake Juam, confluence of Bosung and Dongbok tributary. The purpose of this study is to measure water quality in the transitional zone and tributaries of Lake Juam and derive upper streams which need intensive management.

Chl-a, concentration in the transitional zone of Bosung river and Dongbok stream, is measured to be about 15mg/m3 in March, May and September, but that of Songkang stream is measured to be over 10mg/m3 in September and October. The high peak of BOD, T-P and T-N in transitional zone is measured at May to July, during heavy rain season. This means that non-point source (NPS) management in upper sub-watershed is needed. Because the correlation coefficient between T-P and SS is high ( $r^2=0.801$ ) during heavy rain, to improve the water quality of transitional zone need to NPS management of upper sub-watershed.

The streams needed intensive management for NPS drew Bongwha stream, Yoeseo stream and Yiseo stream.

779. (Paper)

**The Impact of Renewable Energy Projects in Tanzania on Poverty Alleviation and Environmental Management: The Case of Biogas Use in Rungwe District South West Tanzania**

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This study examined the impact of renewable energy projects in Tanzania with the focus of biogas use in Rungwe district. Most of these projects were undertaken without EIAs and therefore this study was more on assessing environmental management resulting from biogas technology and its limitations.

Two hundred households with and without biogas facilities were selected randomly from four villages. Structured, semi-structured and open-ended discussion was used to gather information. There was also physical observation in the field.

Findings show that households with biogas facilities have reduced fuel wood consumption from over five bundles to just about one bundle per week. This is equivalent to the reduction of 3700 ha from deforestation per annum. Most of them have also stopped using kerosene and charcoal, which has had significant impact on poverty alleviation and environmental management. The technology also creates employment especially for the youth who perform most of the biogas installation activities.

134. (Paper)

**Water Resource Variability and Livelihoods in the Lower Rufiji Wetland Ecosystems (Tanzania)**

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The Rufiji River, with a mean annual flow of approximately 800m<sup>3</sup> /s is one of the largest rivers in East Africa and characterized by the variability of its flooding pattern. At present three dams have been constructed on its upstream, controlling 23% of the flow. A large multi-purpose dam that would control 95% of the flow is planned at the Stiegler's Gorge. The flooding pattern of the Rufiji River will be affected by this project with complete disappearance of the flood and its beneficial effects on the down stream wetland ecosystems of 500 km<sup>2</sup> and the wetland associated livelihoods. The research objective is the production of detailed knowledge on the relationships between floodplain communities and their environment dynamics. These local scale issues are framed within the hydrological context at the river basin scale. Local agricultural practices are sophisticated and adapted to the variability of hydro-climatic conditions. These livelihoods can cope with short drought periods but are collapsing under the current hydro-climatic conditions. The current state of livelihood diversification in the Rufiji Delta

floodplain ecosystem has been increasing pressure on the coastal forests ecosystems and led to reduction of forest cover in mangrove and the coastal forests.

364. (Paper)

**Post-Project Review on Navigation Channel Improvement Project of Upper Mekong River**

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The Navigation Channel Improvement Project of the Upper Mekong River is designed to upgrade large vessel navigation. The EIA report concludes that water level fluctuation from navigation improvement works will be small and limited, while water fluctuation was observed for the whole of the boundary river area. The report clearly said, "no soil erosion will happen at the reef blasting places." Erosion in fact has occurred. Riverbanks, sandbars and islets that appeared during the dry season are currently nonexistent. As for socio-economic impacts, a generalized indication of the impacts on the quality of life is made with advantages being increased opportunities to improve living conditions. In reality, illegal trade of wildlife, timber and drugs has been taking place across boundaries. The number of fishermen has decreased in Thailand, reflecting the fact that fishing is no longer a way of generating income. Factors affecting the accuracy of EIA include: (a) Assessments were made by techniques that were not specified, data with ambiguous sources. (b) Report does not consider long-term impacts and hence cumulative and secondary impacts are not discussed. (c) Incapacity of the affected countries to ensure the consistency of the EIA measures with the international and domestic regulations.

670. (Paper)

**Coastal Setback: Precautionary Approach to Climate Change and Its Impact on Coastal Area in Korea**

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The coastal zone in Korea is an important area in economic and societal aspects. 27% of the total national population resides and 90% of national industrial complexes are located in the area. Nearly 99% of manufactured products are exported abroad

through trade ports. Moreover, several scientific findings demonstrate that coastal habitats could play a key role in reducing economic, environmental and social damages from natural hazards such as torrential rains, storm surge, tsunami, and sea-level rise. In Korea, reclaimed area in semi-closed bay suffered heavy damage from a storm surge called "Maemi" in 2003. The Korean government allocated USD 3 billion to recover from the damage. The damage was caused by verified as unplanned and indiscernible developments, which is the reason why the hazard is called "human-made" not "natural" hazards. Even though it is not clear that recently increasing natural hazards are caused by climate change at global scale, causal relationship between climate change and natural hazards increase is, to some extent, feasible. Coastal setback as precautionary approach to scientific uncertainty can be very effective institution to adaptively tackle climate change and its impacts. The Korean government is preparing to incorporate the setback-related provision into Coastal Management Act of 1999.

363. (Paper)

**Post-Project Review on Navigation Channel Improvement Project of Upper Mekong River**

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669. (Paper)

**Strengthening Public Participation in Decision-Making Process for Balancing Coastal development and Environmental Revitalization in Korea**

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The Masan Bay, a highly polluted semi-closed area, is the most representative area demonstrating coastal environmental issues of Korea, such as deterioration of marine ecosystem, loss of tidal mudflat, redtides, etc. In 2000, this Bay was re-designated as a Special Management Area to effectively control socio-economic activities of its watershed, which had directly impacted marine environments. Coastal stakeholders participated in reviewing and developing the framework plan to improve coastal environment of the Bay. It was meaningful event because this participation was unparalleled case that stakeholders had experienced even though it was informal public consultation. Total pollutant load management system (TPLMS), a new policy, was introduced to consider marine environmental carrying capacity in coastal development in 2004. In the meantime, public awareness on coastal revitalization becomes increasing and TPLMS tends to function as a regulatory institution on land developments such as the expansion of industrial complex and houses, and the reclamation. Accordingly, securing stakeholders' participation in decision-making system became an integral part in ensuring sustainable development. The newly formulated policy includes the application of state-of-the-art sciences, the assessment of scientific researches by experts designated by each stakeholder, and the public participation in decision-making process.

667. (Paper)

**Military Paradox and Marine Peace Park in Transboundary Coastal Area in the Korean Peninsula**

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The transboundary coastal areas of the Korean Peninsula have very valuable natural resources and coastal ecosystem for the present and potential uses because of long-lasting politico-military confrontation between DPR Korea and RO Korea. Accordingly, regulation and limitation of socio-economic activities on the areas have prevented the marine and coastal ecosystem from being degraded by irreversible developments elsewhere in both Koreas. Despite two military clashes in 1999 and 2002, the relationship between two Koreas has been improving and several achievements have been made. More efforts in enhancing cooperation between two Koreas were made for land-based economic developments, paying less attention to coastal environmental management and ecosystem protection. It implies that the coastal environment would deteriorate, and military confrontation not easily soluble if more cooperative mechanism is not formulated and implemented to address different issues from military, economic, and environmental sectors in an integrated manner. Marine Peace Park Initiative adopted by RO Korea will provide a firm base to tackle complicated situation in the coastal transboundary area, especially in the western sea of the Korean Peninsula.

491. (Paper)

**Early Contractor Involvement for Infrastructure Development: Experiences and Challenges**

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The Dutch Ministry of Transport strives for earlier involvement of market parties (contractors) for strengthening its road development planning. The final objective of this policy is to achieve more sustainable projects with a broader scope in time (life-cycle) and space (area-oriented-approach).

This paper addresses recent experiences gained with early market involvement in eight projects for road, water and railway infrastructure. For these projects strengths, weaknesses, opportunities and threats are analysed addressing issues as: procedure, process and content. In addition, various alternative approaches for early market involvement in infrastructure planning are discussed, in the Netherlands and abroad.

Subsequently, the paper discusses practical problems, pitfalls and solutions of early contracting in planning practice. Finally, the challenges for early contracting as a way towards sustainable development are drafted focussing on its potential role for a businesslike way of tiering of planning

process stages (SEA/EIA, sustainable building, EMS) and linking linear infrastructure with its spatial context.

The paper concludes with a brief discussion of the 'next frontier' enlarging the scope of contracting: not only optimising a design in relation to material use ('green procurement') but also including a balanced mix of ecological, economical and social aspects (e.g. ,Triple Bottom Line).

353. (Paper)

**Actual Condition of EIA Review Committees in Japanese Local Governments**

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This study focuses on EIA review committees and conducted a questionnaire survey on 56 municipalities to grasp the actual condition and problems of operational aspects of the committee. The following implications were obtained: (1) There were few opportunities of inquiries after the stage of F-EIS. This condition is also true of the on-site inspection after the stage of construction with the exception of the only part of municipalities such as Saitama prefecture. (2) Three are 27 municipalities where it took less than a year until a submission of draft EIS from the completion of a scoping stage. (3) A few committees had requested considerable revisions of EIA or had a negative judgment for the project itself. (4) Almost all of the municipalities have disclosed both of the meeting and minute except 4 committees. Furthermore, internet disclosure had a tendency not to be sufficient. (5) Relating to the members of the committee, there were few committees that included an expert on the EIA system. Meanwhile, there were no cases to join the member by public offering at the point of time to conduct survey. Also, most of administrators regard the member by public offering less important.

253. (Poster)

**Economic Valuation of Health Effects within Health Impact Assessments' (HIA)**

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Context, survey method and results will be summarized in the poster.

Public health experts widely agree that policies, programs and projects of numerous sectors decidedly influence health determinants, hence the surge of interest in prospective "Health Impact Assessments" (HIA). Likewise, economic

considerations currently pose a major challenge throughout the field; health economists developed a range of approaches to calculate (in)direct costs of diseases, treatments etc. The question comes up, if and how economic valuation of health effects within HIAs takes place, or could/should in the future.

To investigate this issue, the Department of Public Health, U Bielefeld, and the Institute of Public Health NRW, Germany, together conducted an email survey. The answers of 68 participating experts and practitioners from 16 countries and from international organizations showed that so far, only a small fraction of them (7%) have conducted economic valuations; more than one third (37%); however, at least sometimes discusses this option. Main obstacles seem to be lack of knowledge about methodological details, existing uncertainties, and various problems in defining economic value for effects on health. Cost-benefit, cost-effectiveness, and cost-utility analysis were nominated most frequently as candidate methods. Participants also provided nearly 300 commentaries concerning potentials and/or risks that these economic valuations might have.

531. (Paper)

**Stakeholder Participation in the Road Planning and EIA Process: The Case E22/Eastern Entrance to Riga in Latvia**

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The E22/Eastern Entrance to Riga is one of the first highways to be developed in Latvia, in the rapidly expanding (residential) eastern part of the capital Riga. At the moment, Riga is connected to the east by the motorway A6, but this road provides insufficient capacity. Furthermore, new residential and commercial zones are planned in this area. The preliminary planning process, including EIA preparation, is presently ongoing. Several new road alignments are possible, and all alignments have

different significant adverse impacts in the suburban areas of Riga city.

Spatial planning is organized bottom-up in Latvia. This means that local authorities are vital, deciding stakeholders that can impede road development. This requires their full and early involvement in the road planning process. Also, the local inhabitants have views on the new road and need to be involved in the process. Currently, stakeholder participation is limited, delaying the planning process and possibly requiring even new alignments. The present lack of cooperation between interested parties needs a breakthrough.

We would like to discuss the current status in relation to stakeholder participation, and the options available for turning the road planning process into a sustainable, participatory and constructive one.

530. (Paper)

**Stakeholder Participation in the Road Planning and EIA Process: The Case N18/Achterhoek in the Netherlands**

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The N18/Achterhoek is an existing motorway in the Eastern part of the Netherlands. Due to road safety issues, deterioration of the local living environment and the wishes to improve accessibility and enhance economic development, the road will be upgraded. Various alternatives are being considered, including new alignments, diversions around city centers, and enlargement of existing sections. The Trajectory Note/EIA is currently being prepared.

Stakeholder participation has been deemed important and the project has been marked as pilot project for an improved form of public involvement in the road planning and EIA process, entitled "public participation new style." A clear participation model has been designed in which stakeholders are – to varying degrees – involved in the road planning process. Furthermore, the road is partly financed by

stakeholders (the regional authority, local authorities and the business community), next to the main financing provided by the Ministry of Transport. This has also influenced the stakeholder participation model.

The case will present the applied stakeholder participation model and the lessons learned. We would like to explore together with the participants of the session the possible applications of this approach in other road development projects.

490. (Paper)

**The New Era of HIA in Thailand: The HIA Annual Report 2006 and the Strategies for Future HIA Development in Thailand**

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Since 2000, Thailand has embarked on the journey of developing HIA. Its beginning was triggered from the National Health System Reform, then the HIA Program was launched by the Health Systems Research Institute and the HIA Division was set up under the Ministry of Public Health. HIA has been implemented in various issues by different actors.

In 2005, the ministerial cabinet approved the resolution on HIA development in response to the recommendation of the National Economics and Social Advisory Council. The Tenth National Economics and Social Development Plan 2007-2011 also specifies the goals and indicators on HIA development. Last but not least, the National Health Act, which affirms the rights of Thai people to request for and participate in HIA, will be entry into force in the beginning of 2007.

The HIA Annual Report 2006 is the result of the collaboration between all key organizations related to HIA. The report will provide the comprehensive picture of HIA development in Thai society. More importantly, it set out the vision, goals, and strategies for HIA development during the next five years, which can be considered as 'the New Era of HIA Development', because of all of these enabling institutional foundations.



419. (Paper)

**Growth, Conservation and Responsibility;  
Promoting Good Governance and Corporate  
Stewardship through Impact Assessment: Niger  
Delta Experience.**

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A survey conducted in Ogoni part of Rivers State, Nigeria, 2005 on the utility of nypa palm (*Nypa fruticans*) showed that rural communities depend on some species that had been tagged "ecological nuisance species." The study indicated that 75% of respondents use nypa for mats, roofing, and even young seeds are eaten as food in the rural areas. This natural species has great importance in economic development and can improve the livelihood of rural communities.

Amid youths' restiveness and high unemployment in Nigeria, especially in the Niger Delta region, the Niger Delta project is part of the government's sustainable development programmes initiated by the Nigerian affiliate of the international Association for impact Assessment (IAIA-Nigeria) to be achieved through community development projects and national development programmes like the National Economic, Empowerment and Development Strategies (NEEDS) and its corresponding ancillary programmes at the state and Local levels; SEEDS and LEEDS respectively. As a complementary roles of IAIA-Nigeria whose purpose is to assist communities, governments and industries in securing equality, prosperity and tranquility for the Niger Delta region of Nigeria and to ensure grass root participatory economic and environmental management programmes in which household participatory projects (HPP) a microcosm of participatory technology development via participatory rural development strategies (PRDS) enhance participation of the rural poor.

Growth, Development and prudent management of natural resources especially non-oil resources abundant in the Niger Delta could quell the resources crisis, improve rural welfare and

consolidates the sustainable development programmes of the Nigerian government aimed at reduction of poverty and ensure better wellbeing of her citizens especially in the Niger Delta.

299. (Poster)

**Alternatives in High Voltage Substation Project  
EIAs: One Engineering Approach**

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Criterion for alternative judgment as specified in the Serbian EIA Rule-book are location or trace, technology or production processes, working methods, location plans and project designs, type and choice of the material, project time schedules, operation and decommissioning, start and end time of project implementation, production volume, pollution control, waste management, access control and traffic, responsibility and environmental protection control, training, monitoring, emergency planning and de commissioning, location rehabilitation and post project usage.

Similar to the other international practice, the consideration of alternatives is the obligatory part of Project Environmental Impact Assessment (EIA), pursuant to applicable Serbian Rule-book on EIA. In the article 5 of the mentioned document 17 criteria are specified as obligatory factors for alternative judgment.

Sometimes the creation of alternative solutions is a complicated task (for example, when object under consideration exists as a part of huge system, planned on much more strategic levels, or technical solutions are, at current status of BAT unique and could not be altered) – typical examples are transformer substations as a part of the biggest today's technical systems – power systems. In the method proposed in this poster paper, the balance between EIA legal requirements and project options' restrictions is achieved by adopting those 17 obligatory criteria as criteria parameters in multi criteria analysis matrix. With such approach, the whole alternative assessment process is transferred from qualitative to the quantitative assessment, and, what is even more important, the focus of interests moves from the expert subjective assessment to the transparent discussion about criterion importance, so alternative solutions are not necessary to be elaborated in details – only regarding adopted criteria.

600. (Paper)

**The Appraisal of Growth and Conservation in Promoting Corporate Governance of Sustainability**

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One example of good governance is ensuring that the electorate is given regular opportunities for free and fair elections, but the need for stakeholder discussions between elections is equally important and often overlooked.

From this view, the paper will look at how growth and conservation promotes good governance, how corruption affects good governance, who should be involved in the corporate governance and the impacts of governance (bad or good) on growth and conservation.

For a long time, there have been divergent views on the man-environment resource nexus. Economists as well as other schools of thought with capitalist perspectives of the environment contend that the environment offers man limitless resources of growth.

One area that was readily seen to promote economic growth was industrial development. So it was that effects were geared towards industrialization in every part of the world without stopping to think what the effect could be on the environment.

In addition, habitat loss is the primary threat to terrestrial biodiversity. Since the survival of the inhabitants depends on the exhaustible resources of the environment, it therefore calls for careful management of the environmental resources. Growth is no longer an overall aim of economic development, having been replaced by stability as a desirable goal.

Thus conservation is defined as the management of human use of the biosphere so that it may yield to greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generation.

Therefore, good governance is a very important determinant of economic growth and the improvement of people's livelihoods.

698. (Paper)

**A Study on A/R CDM Application of Deforested Land in North Korea**

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The purposes of this study are, first, the chronological analysis of North Korean forest to confirm the feasibility of A/R CDM in North Korea; second, the economic feasibility study to compare CER income with forestation income. The results of this study are first the suitable A/R CDM sites are 174,542ha on the basis of the forestation change analysis in North Korea.

Second, it is found that A/R CDM Project can be applied to restore deforested land. IRR is 6.70% including wood sales on the basis of CER price, 15 US\$/tCO<sub>2</sub>. Also, even without wood sales, 45% of total cost can be covered by CER income.

Third, the profit of the project greatly increases in case of Joint Implementation or domestic forestation. If North Korea and South Korea are subject to the Kyoto obligation; consequently the project's scheme becomes JI, or the project's scheme becomes domestic forestation as Kyoto Mechanism after unification, CER income itself amounts to IRR of 5.16%, and the profit increase about 5 times than A/R CDM through the sensitivity analysis.

707. (Paper)

**Movement of Eco-Village for ESSD in Korea**

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Recently there have been many urban environment problems such as heavy concentration, real estate speculation, urban sprawl, environmental pollution, traffic congestion, crimes, and alienation, etc. Such problems result in the effort or movement for environmentally sustainable urban development.

Since 1980s the eco-city has been appeared by Ministry of Environment and Green-city presented by local government, with the objectives of environmentally sustainable development. Local governments have provided various incentives and other kinds of support.

In addition, since the 1990s eco-village has been suggested and now comes true for the ecosystem preservation and community cultural conservation. The eco-village has been planned and supported by the Ministry of Agriculture and Forestry.

The object of this study is to suggest some alternatives for eco-village. Thus the study analyzes the examples of eco-city, green-city and eco-village in Korea, tries to find out the problems of existing eco-village, and suggests a beneficial eco-village considering effects on neighboring villages

414. (Paper)

**Air Pollution and New Town Developments in the Seoul Metropolitan Area**

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Urban developments have been continuing ceaselessly to satisfy the growing demand for housing in the Seoul Metropolitan Area. However, these new town developments are responsible for increased various environmental problems. Among these problems, air pollution, which is a very important factor in determining the quality of life, is spreading from Seoul to neighboring new town areas.

Although the Korean government has been undertaking efforts to improve air quality, there have not been any significant positive effects because the focus of policies has been on controlling the total amount of pollutants.

Therefore, this study was conducted to analyze the correlation between air pollution and new town developments using density factors to determine their contribution to air pollution. The results from simulated analysis in this study are as follows: The level of air pollution in developed areas was found to be higher than in other places. Moreover, air pollution of employment centers and commercial-business areas where heavy traffic volumes can typically be found, were determined to be higher than in other areas.

The outcome of this study can contribute to the establishment of better urban development strategies with long-term and wider area considerations.

703. (Paper)

**The Analysis of Temperature Reduction Effect of An Extensive Greenroof**

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It is well established that rooftop greening of buildings can serve to reduce both the surface temperature and the indoor temperature. In fact, rooftop greening is regarded as an effective ecological method for improving microclimate, mitigating the Urban Heat island (UHI) effect, and saving energy consumption for cooling. The significance of this study is that it confirmed the temperature reduction effects of greenroofs, which depend on vegetation, soil type, and soil depth. In particular, the results showed that greenroof can reduce the surface temperature by 10°C with soil, and by another 10°C with vegetation. Greenroofs can offer thermal protection, which can reduce the thermal load of buildings by up to 0.8~2°C. An extensive greenroof with a 10°C soil media can reduce the surface temperature by approximately 20°C indoor temperature by approximately 1.4°C; at 2 p.m. in summer. The findings of this research can be used as a scientific basis to suggest the conditions of vegetation, soil types, and soil depth of an extensive greenroof as an effective means of the temperature reduction.

413. (Paper)

**The Influence of Urban Development Density on Water Pollution**

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Water pollution is worsening due to increases of impermeable layers and unusual weather. Moreover, insufficiency of the self-cleaning capacity in sub-basins causes serious water pollution during dry seasons. Another major area of water pollution is occurring in watersheds located in lower reaches.

Environmental impacts of urban development have been known to function cumulatively in watershed areas. Because increase of impermeable layer and pollution sources is being caused by urbanization,

an effective water pollution reduction program should be established through the forecasting of flow rate and water quality.

This study analyzed dynamic variations of water quality by using HSPF in the upper reaches of the TanCheon watershed area. Environmental impacts caused by urban developments were analyzed by comparing density factors (ex. population, employment, land use, etc.) with changes of water pollution. The results revealed that water pollution has increased exponentially with urban development density factors. This study determined that urban development strategies need to be established in consideration to changes in regional and long term water pollution to manage water quality more effectively.

567. (Paper)

#### **Implementing Social Issues in a Trunk Road Project In Ghana**

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The Government of Ghana with assistance from the Danish International Development Agency (DANIDA) is rehabilitating a 46 kilometre Konongo - Kumasi road and the associated socio-economic activities. The main objective of the component is to help stimulate growth of the Ghanaian economy through cost minimisation on the trunk road network, as well as to improve road safety.

The road section forms an important part of one of Ghana's principal highways, connecting not only the country's capital with its second largest city, but also providing the primary means of access to the northern part of the country. The road also serves as an international transit route for Ghana's landlocked neighbours of Burkina Faso, Mali and Niger.

The project had a separate budget allocated to address the socio-economic needs of the communities along the road corridor. The methodology used was participatory to identify and prioritised the needs of the beneficiary communities and has built market stalls with sanitary facilities, toilets and boreholes facilities to replace old dilapidated and non-existing ones.

782. (Paper)

#### **Concept of Natural Resources Inventory and Framework of Utilization**

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These days, we are realizing the earth's resources are limited and facing the fact that future sustainable human life is in decline. To secure future human life, we have to tackle problems more intelligently and hopefully even with some ethical approach. For the global land use plan, we only have a poor general strategy which cannot cope with the future decline. We have to pursue solar energy incorporation to be maximized where there are only limited earth resources and take this into consideration as a basis for land use plan.

The concept of natural resources can be considered as an ecosystem with living and non-living matter. The idea will be represented by 'Land' explained by Leopold in his book *Sand County Almanac* or 'Ecotessera' explained in one case in Jenny's book named *Natural Resource*. In defining an inventory, it is necessary to be rated or valued in one way or another. In short, we need to have a process of epistemological and axiological steps. To establish a framework for utilizing the natural resources inventory, we already have such sites as museums, libraries, institutions and government agencies. Then we can make use of them for planning for the future, with appropriate organizational principle.

125. (Paper)

#### **Economic Development, Urban Growth and Impacts: Issues of Livelihood, Vulnerability and Sustainability in Yenagoa Metropolitan Area, Bayelsa State, Nigeria**

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Yenagoa, the metropolitan capital of Bayelsa State, Nigeria, has continued to witness an unprecedented increase in its population since 1996 when it became a capital territory in addition to its status as the headquarters of Yenagoa LGA. Constrained by its own physical setting, situated on a uniquely complex ecologically low-plain topography, largely of wetlands and back-swamps that is susceptible to seasonal flooding, the overall terrain of the area constitutes a problem to development. The State has and has continued to witnessed rapid economic development, but unfortunately, the prevailing patterns of resource use remains largely unsustainable. Development planning and projects' implementation are not been guided by impact assessment (IA) to provide mitigation for anticipated adverse impacts. So far, some telling consequences are beginning to emerge for this lack of environmental input. Another dimension of the development tragedy is the spatial amalgamation or transformation of previously non-urban areas into urban area, occasioned by the annexation of several communities as part of the greater Yenagoa metropolis. This urban growth and urbanization scenario has impact on livelihoods and is also

creating economic vulnerability. The paper looks at the implication of government's development drive from sustainable development perspectives.

215. (Paper)

**Evaluation of Sustainability in Spatial Planning and Management. Shortcomings in the Implementation of an Integrated Approach at Sub-Regional Scale**

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This paper presents results and conclusions from the development and validation of an integrated approach focused on sustainable spatial management which aims to be used by territorial managers on the implementation of strategies and plans on regional and local scales but also to set goals and management action lines. This study is part of "OIKOS," a strategic research project 2005-2006 for Environmental and Sustainable Spatial Planning and Management.

The OIKOS IDSS (Integrated Decision Support System) project has been developed as an integrated system focused on the regional and local level of sustainable spatial management and to be used during the decision making processes. It is based on a coherent set of tools that include a set of sustainability indicators, a database management system, GIS, multicriteria analysis, cost-benefit analysis, concept modelling and participatory tools.

Conclusions will focus on the constraints and limitations which take place during the development and validation of an integrated approach for the assessment of sustainability, especially in terms of

stakeholders' implication and participation, limitations on the use of certain tools, time constraints and interaction with other assessment or planning instruments.

577. (Paper)

**Applying the OECD Guidance on Strategic Environmental Assessment. Capacity Development in the Context of German Technical Cooperation**

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Trainings of the German Technical Cooperation (GTZ) are designed to empower people to participate in political, economic and social life and to modify the structures in environmental policy making and in management of natural resources geared toward sustainable development and poverty reduction.

The presentation illustrates (a) Germany's application of the "OECD Good Practice Guidance on Strategic Environmental Assessment in Development Co-operation," (b) purposes and results of our training on Strategic Environmental Assessment, and (c) its innovative, interactive and effective learning methodology including its benefits and limits.

Core elements of the SEA Training are Harvard Business School based case-works in groups, simulations and short conceptual inputs. Participants around the world have so far worked on fictive case studies on Transport and Poverty Reduction Strategies in order to facilitate a transfer of knowledge and to strengthening respective capacities to build and to implement their own SEA strategies or to cope with existing legislation.

The training has been developed by the German Technical Cooperation (GTZ) and Capacity Building International (InWEnt) on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ).

322. (Poster)

**Impacts of GTZ/InWEnt Training on SEA**

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The poster shows the application, evaluation and impact of our SEA training in various processes

within development co-operation. The training itself is based on both practical perennial experiences with impact assessment tools in development co-operation and the "Good Practice Guidance on Applying SEA in Development Co-operation," the official guidance of the OECD Development Assistance Committee

The training has been developed by the German Technical Cooperation (GTZ) and Capacity Building International (InWEnt) on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ).

238. (Paper)

**Environmental and Moral Consequences of Industrialized Meat Production and Trade**

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Meat production has serious consequences for local environments. The full extent of these harms to local waterways, landscapes, and air is difficult to determine, and the costs are rarely included in decisions about where and how to produce meat. Trade further complicates the identification and control of these negative environmental consequences by separating production from consumption. Producers might underestimate the local environmental impacts of their meat exports, while consumers might enjoy meat at far below its true cost.

Our model constitutes a first attempt to quantify and make spatially explicit the nitrogen, water, and land inputs into traded meat for four case study nations (Japan, the US, the Netherlands, and Brazil). Our results are startling: over 60% of the nitrogen releases from Japan's meat consumption occurs overseas; 5% of the US's total water withdrawals is used to produce meat consumed in other nations; and foreign consumption of meat uses over half of Brazil's feed-growing land.

As more information becomes available about the far-flung and increasingly significant environmental consequences of meat consumption, consumers and producers alike will be faced with moral choices about their habits, and decision-makers will have to intervene to protect social goals.

283. (Paper)

**SEA Approach for Global Warming: A Concept and Methodology**

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Global warming has been largely blamed on unsustainable increases in carbon dioxide concentrations, with landuse change contributing 20% of anthropogenic carbon emissions. Soils store about 230 times the amount of carbon now released through the burning of fossil fuels, about twice as much carbon than the atmosphere, three times more carbon than the vegetation medium. Also, landuse change can singly free up to 50% of its current soil carbon and exacerbate global warming. SEA can appropriately provide a methodical and systematic avenue to optimise the terrestrial medium in addressing global warming. The instrumentality of such an SEA is in optimising the balance between terrestrial sinks and sources, in relation to landuse and landuse changes; and the approach of decision windows is key to this methodology. Such an SEA has the advantage of providing a globally sanctioned platform for resolving equity issues that have been between the "developed" and "developing countries." The approach offers explicit mechanisms to distill and instill the decisional imperative and methodical procedures to potentially sequester carbon amounts equivalent to four times the current capacity of the Kyoto Protocol. This SEA approach is a theoretical conceptual model and is still open to discussion and revision.

166. (Paper)

**Identification of the Social and Environmental Impact Assessment of Land Titles Policies on the Indigenous Populations of the Peruvian Amazonia. Consolidation of the Communal Property of the Indigenous Communities Asháninka as a Strategy**

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The principal objective of this paper is to assess the impact of land titles policies of the Peruvian government that contribute to the disintegration of the communal territories of the indigenous people in the Peruvian Amazonia. Also, it evaluates how these policies oriented to the individual land titling have the intention to maximize the use of Amazon land and of its natural resources, but simultaneously they contribute to the deterioration and the degradation of the Amazonian forests.

The communal property has been demonstrated to be efficient, and therefore it would be necessary to make a reformulation of the land policies in order to

stimulate the communal titling instead of the individual titling.

In this work it will be sustained that it is necessary to fortify the State institutions with a suitable allocation of the roles and transparency in the procedures, towards a territorial ordering of the Amazonia and in a frame of recognition and respect to the pre-existing rights of the amazonian indigenous people, contributing this way to a sustainable development with an efficient management of natural resources that reduces the social pressure in the area and prevents greater conflicts in the zone.

144. (Paper)

**Water Governance and Sustainable Use of Water Resources in Uganda Through EIA**

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Water is critical for human health and well-being. It has been described 'as a wonderful substance,' 'the noblest of the elements' and 'the first of things.' Social and economic development cannot occur unless with adequate supplies of fresh water. Its sustainable use can promote economic, social development, political stability and ecosystem integrity. Water governance refers to the range of political, economic, social and administrative systems put in place to develop and manage water resources and the delivery of water services at different society levels. It comprises mechanisms, processes and institutions through which stakeholders, including citizens and interest groups articulate their priorities, exercise their legal rights, meet their legal obligations and mediate their differences. In Uganda, EIA has become a useful tool in sustainable management of water resources. This paper seeks to illustrate how EIA is promoting water governance and sustainable use of water resources in Uganda. It will review key elements of water governance and assess how EIA has contributed to sustainable management of water resources, assess the challenges of implementing EIA in management of water resources and make recommendations on how it can be used to improve water governance and sustainable use of water resources in Uganda.

306. (Paper)

**Role of Environment and Social Impact Assessment in Corporate Social Responsibility**

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The paper attempts to assess and analyse the role of Environmental and Social Impact Assessment in designing Corporate Social Responsibility (CSR) in

both public and private sector operations and activities.

The paper will look into how EIA can be used in identifying needs and projects that CSR can address including those that do not necessarily related to the corporate agenda

The paper aims at convincing corporates on the importance of EIA and other related tools is one way of devising CSR programs and projects.

762. (Poster)

**Municipal Training, EIA**

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The GMDAM-AMDC Gerencia de Manejo y Desarrollo Ambiental Municipal, of Tegucigalpa, Honduras, carried out a training workshop on environmental issues and mainly on EIA between February-March 2007.

This program was developed as a part of an institutional strengthening initiative, supported by FORCUENCAS, a European Union environmental project for the region.

It is expected to serve as a pilot project for the rest of the municipalities within the country with local environmental units, due to the importance of local authorities and communities in the management of their environment and natural resources in pursuing sustainability.

The poster aims to show the above, and exchange with other professionals involve in central and local governments their views and experiences within the issue, focused on capacity building programs.

369. (Paper)

**Health Benefits of Reducing PM10 through the Seoul Air Quality Management Plan**

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BenMAP, developed by the US EPA, is a GIS-based software tool that estimates the health impacts and

associated economic values connected with changes in ambient air pollution.

It is expected that PM10-related premature mortality be reduced from employing air quality control measures. In this study, health benefits from implementing the Seoul Air Quality Management Plan 2014 were assessed using BenMAP, or the Environmental Benefits Mapping and Analysis Program developed by US EPA. SAQMP 2014 is a landmark policy in Korea that stipulates emission standards, a total air pollution load manager system, an emission trading system, the supply of low emission vehicles, and so forth. The plan has set its goal of PM10 at annual average of 40 ug/m<sup>3</sup> in 2014.

The PM10 concentrations assuming the SAQMP implemented successfully were predicted with the MM5 / CMAQ model. PM10 exposure related premature mortality functions were developed using death statistics and air pollution monitoring data of Seoul. Economic valuation functions driven from benefit transfer methods were utilized. Through the SAQMP, PM10 concentrations were estimated to be lowered by 15 mg<sup>3</sup> to 75 mg<sup>3</sup>; depending on air quality modeling grids. 2,031 premature deaths could be avoided in the Seoul Metropolitan Area. The economic value of the deaths avoided was estimated to \$4.8 billion (95% CI \$325 million ~ \$10.3 billion) using the benefit transfer value.

679. (Poster)

**Assessment of Pollutant Accumulation and Washoff Potential on an Urban Area**

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The quantitative understanding of pollutant accumulation and washoff is a key task for a successful urban runoff modelling. Runoff water quality modelling is a difficult task because the non-point sources (NPS) are diffuse places. This study investigated the pollutant build-up and washoff potential based on field experiment and GIS technique for urban runoff modelling. To estimate the pollutant accumulation and allocate the parameters in storm runoff modelling, a field experiment of non-point source (NPS) pollutant (e.g., dust and dirt) buildup was conducted on the study catchment. An NPS measuring device (1m×1m rectangle) was installed at 2 locations of the each land use category. The average accumulation ratio of dust and dirt was analyzed for 3 days and 7 days. For the washoff potential of NPS, universal soil loss equation (USLE) was employed with GIS. USLE is a method to handle this non-point source problem (Wischmeier and Smith, 1978). The risk map, which

represents the high NPS wash off potential, was produced using GIS and the modified universal soil loss equation.

461. (Poster)

**A Study on the GIS-Based Environmental Impact Evaluation for Route Alignment**

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Road construction has an extensive impact on our environment and this impact is hardly restorable. So social conflict caused by road construction has increased continually in Korea. As a means to treat this kind of problem, there is EIA and pre-EIA in Korea. But generally these are conducted after the process of route alignment and there's no way to treat environmental issues in route alignment properly. So these have a limitation as a solution for the problem in route alignment.

This study tried to approach this problem and has derived the way of quantifying environmental issues in route alignment. So this study also thought about the effective way of combining and decided to adapt a GIS based map overlay method.

To adapt a GIS-based map overlay method, a weighting process is needed. To weight each factor, this study adapted AHP (Analytical Hierarchy Process), which is a kind of multicriteria decision making process. So this study derived the way of quantifying by using GIS and AHP. And by performing a case study, this study examined effectiveness and availability of the method.



Though there are some limitations, the effectiveness and availability of this method is verified and it is hoped to be used practically.

421. (Poster)

**Development of the Gyeongsangnam-do Wetland Information System Based on Web-GIS**

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The purpose of this study was to develop an interactive Web-GIS and geodatabase for the wetlands in Gyeongsangnam-do, Republic of Korea, providing digital wetlands data services. We used ArcIMS, a commercially available software, which was extended using a Oracle Database, Visual Basic, ArcSDE, JSP, ASP to customize our application. Our Web-based tool facilitates sharing data globally and provides end-users a cost-saving solution to access up-to-date spatial datasets customized for a specific topic to users with limited GIS knowledge. Regional agencies and others are making increased use of our Web tool to assist in the decision-making process to restore and preserve wetlands in Gyeongsangnam-do.

663. (Paper)

**Typhoon Damage Impact Assessment of the Young-dong Region**

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This study examined frequency, magnitude, intensity and damage for disaster due to typhoons

affecting the Young-dong region, which mentioned a measure for reduction of typhoon disaster. The years of affecting the Young-dong region have gradually increased. The rainfall of the Young-dong region caused by typhoon has increased. In particular, the frequency of extreme precipitation events has significantly increased. Otherwise, it was very difficult to look up variation of maximum instantaneous wind speed. In the case of typhoon damage, the number of deaths has decreased but property damage has increased. The Young-dong region was seriously damaged because it was affected for two consecutive years with typhoon "Rusa" in 2002 and typhoon "Maemi" in 2003. Typhoon "Rusa" caused 246 people dead or missing and 5.1 trillion won in property damage over the South Korea. The Young-dong region accounted for more than 50 percent of whole property damages over South Korea, since the damage was 143 people dead or missing and 2.5 trillion won in property damage. Particularly, public facilities were most seriously damaged. As a result, it is required to make up the hydrological system considering inflow and outflow.

596. (Paper)

**A New Decision Making Process for Environment Friendly Resort Development - Case Study on Alpensia Resort Development Project**

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The Gangwon-do Development Cooperation plans for the Winter Olympics basic core facilities to become an international tourist destination by implementing it as an eco-friendly and sustainable development project. While the main priority of this project is to win the Winter Olympic bid for 2014, creating an eco-friendly development system is also a prime concern.

The Gangwon-do Development Cooperation organized an Environment Consulting Committee for Alpensia resort project since its basic planning stages. It is the first time a government company is

doing this. We are trying to implement a decision-making process through an initial green plan. The green plan is monitored regularly by an NGO monitoring team and we are planning to receive feedback for the design stage, construction stage, operation stage and other stages.

This paper introduces the Alpensia Resort's present conditions and proposes a new eco-friendly development planning system. This new eco-friendly development planning system includes decision-making processes as follows:

- 1) Preliminary investigations of existing environmental conditions and environmental capacity of the area.
- 2) Making a total development plan according to the investigations
- 3) Continuous monitoring plans of the development processes and preliminary decision-making processes

681. (Poster)

**Assessment of Groundwater Pollution and Water Quality Susceptibility Using GIS-Based Drastic and MT3D**

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The land use condition and hydraulic soil property is closely related to groundwater pollution. DRASIC (US EPA) with GIS interface was employed to model the susceptibility of groundwater pollution. A drilling survey for soil and groundwater data was conducted for 23 locations in Gimcheon-city area. MODFLOW and SCS-CN method were used to estimate groundwater table and recharge respectively. Drastic Index (DI) were extracted by overlaying the cell-based element map of groundwater table depth (D), recharge(R), aquifer media (A), soil property (S), terrain (T), unsaturated zone property (I), hydraulic conductivity (C). After delineation of high risk area of groundwater pollution, the effect of the pollutant runoff to the groundwater was estimated by MT3D model. The study results indicate that a gently sloped urban area is most susceptible for groundwater pollution and the groundwater quality could be improved at 84% by preventing the sewage from leaking.

476. (Paper)

**Linking SEA and City Development Strategy in Vietnam**

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The review and enactment, in September 2006, of the Law on Environmental Protection in Vietnam, now requires SEA for various planning activities including provincial level cities under Central Government, a process led by the Ministry of Natural Resources and the Environment (MoNRE).

City Development Strategies (CDS) is an approach to strategic planning at the city level. It promotes comprehensive and integrated planning driven by urban social and economic development priorities, including poverty alleviation. It builds on existing policies and plans, promoting the concepts of integration, comprehensiveness and flexibility in urban planning. CDS is increasingly used as a planning approach in Vietnamese first, second and third level cities, under the leadership of the Ministry of Construction (MoC) and the National Institute of Urban and Regional Planning (NIURP).

The Swiss Development Cooperation (SDC) in Vietnam has initiated a project on the potential use of SEA to help integrate environmental issues into CDS. The analysis of the principles, key concepts and potential deliveries of SEA and CDS show common grounds to enhance integrative approaches to urban sustainable development. This paper will present the SEA and CDS linkage regarding methodological and urban-environment cross-related issues, and the challenges for institutional and governance contexts. The particular case of Nam Dinh city will be referred as a pilot-example.

508. (Paper)

**Building Capacity for SEA in Brazil**

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SEA in Brazil has been in place for the last 15 years  
through various experiences at both federal and  
state levels. Earlier initiatives related to international  
cooperation on different sectors such as tourism,  
energy and transports programme development,  
following World Bank and the Inter-American  
Development Bank requirements. Such initiatives  
introduced an earlier concept of SEA very much  
based on EIA methodologies.

A second generation of SEA is developing, with the  
Brazilian federal government promoting SEA  
through more strategic forms of impact assessment,  
tailor-made to the realities of the Brazilian policy  
and planning decision-making. The application of  
SEA to the national planning development process,  
and also to urban development and the energy  
sector, especially oil production and exploration  
programmes, are amongst the most meaningful  
experiences.

Towards consolidation of SEA, the Brazilian federal  
government initiated in 2005 a capacity building  
programme for SEA, jointly promoted by four  
different sectors: environment, planning, tourism  
and transports. This is jointly led by the Ministry of  
Environment and the Ministry of Planning, reflecting  
a strong political interest and a clear sense of  
ownership of the sectors involved. This paper

presents the capacity-building programme for SEA  
in Brazil, the adopted concept and model of SEA,  
progress to date, and the next steps to be pursued.

515. (Paper)

**SEA for Strategic Assessment**

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Successful environmental integration requires  
strategic integrated action. Strategic because it  
needs to be thought within wider, long-term  
perspectives, seeing beyond the limits of the  
observable and even the expectable, paving the  
way, searching options, preparing contexts for what  
is wanted. It needs short and fast-track steps, a  
comprehensive understanding and flexible  
intervention. Integrated because it has long been  
recognized that the environment is part of society  
and the economy, and that outside that reality no  
single, stand-alone environmental effort has any  
chances of sustainable success.

Earlier premises point towards the application of  
SEA with an EIA-based format. This was  
increasingly materialized with the adoption of  
European Directive 2001/42/CE. Other countries  
follow European footsteps, taking the European  
Directive as the paradigm of SEA. Question is: how  
can strategic integration of environment be  
enhanced? Is it getting to the heart of sectoral  
strategic decision processes?

This paper intends to address these questions,  
suggesting that there is an opportunity for SEA to be  
used strategically to help enhance integrated and  
sustainable approaches. SEA can be a tool for  
strategic integrated action if it operates strategically.  
For that, however, it needs to be desired by  
potential users: the sectors, the economy and  
society promoters, because it helps to achieve  
better environmental integration, not because it  
helps to achieve plan and programme approvals.  
Even less if it is taken as a barrier for development  
planning and programme control.

146. (Poster)

**The Results of Strategies to Mitigate  
Environmental Impacts Caused by Light  
Pollution in the Conservation of Sea Turtles in  
Brazil**

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This poster reflects the environmental management measures taken in Brazil to mitigate the impact of light pollution on coastal ecosystems used by sea turtles during their reproductive cycle. Considered a priority for preserving these endangered species, the last remaining areas where sea turtles reproduce are found on the East and Northeast coast, generally scenic areas that draw large number of tourists. In response to this human pressure, since 1990 Technical Cooperation programs have been carried out with the involvement of the public sector through the National Institute for the Environment and Renewable Natural Resources, civil society, through the PRO-TAMAR Foundation, and the private sector, through Companhia de Eletricidade da Bahia, to:

- Diagnose the environmental impacts of light pollution on sea-turtle reproduction;
- Develop standards and criteria to mitigate such impacts;
- Provide guidelines for all segments of society to carry out the standards and criteria adopted and
- Encourage consensus building in order to overcome opposing interests regarding land use.

In recent years, local government policies have attracted private investors to areas considered to be priority to the reproduction of sea turtles, thereby jeopardizing the environmental sustainability of these projects. This poster covers the measures taken in this regard since 1992.

486. (Paper)

**HIA in the Health Assembly: Case Study of Health Hazards Prevention from Mining Policy, Thailand**

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Since the First National Economic and Social Development Plan 1961-1965, mining has been developed for the main aims of employment and economic development. The government did not concern itself with community rights and public

participation, which led to negative impacts on health, environment, and natural resources.

Nowadays, people affected from various mining projects such as coal, rock, gold, and potash mining, join with the partners from the academic and governmental sector to contribute to the health assembly. The main role is to push forward the healthy mining policy, relating to the Tenth National Economic and Social Development Plan 2007-2011 based on the philosophy of sufficient economy for healthy life and social well being.

HIA is the important tool for stakeholders to deliberate the impacts in holistic manner. HIA has been used in the Health Assembly for situation analysis, scoping and impact assessment, synthesis of health impact for Community Guideline, and suggesting the improvement of the related laws, as well as community training.

In the Health Assembly, the role of HIA is not only a tool for prediction of the impacts at project level, but also prevention of health hazards from mining policy through participatory healthy public policy process.

523. (Poster)

**Trends in Corporate Sustainability Reporting: Deeds Not Words?**

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The study is an analysis of the trends during the previous 5 years in Corporate Sustainability Reporting in the UK. The corporate sustainability reports to analyze are a representative sample of the FST100 UK companies. The variables to consider are the quality of the information, type of social and environmental indicators of performance in relation to the corporate activities included in the report, and an analysis of the external audit practices, among others.

205. (Poster)

**The EIA as a Tool of Local Development**

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The EIA is an administrative process that must support technical studies and stages of participation of the involved communities. The sooner the EIA is realized, in time and form, the easier will be the adequacy of the analyzed projects, being constituted, thereby, in the most effective environmental management tool. The goals of Sustainable Development are not compatible with

the current model of consumption, creating serious problems with the conservation of our natural resources, putting in danger the social and economic sustainability of many communities of our region, and accelerating latent conflicts, like nowadays in Gualeguaychú, with the pulp mills, and in the localities close to the mining developments in the Andes, both shown here. Our local communities are demonstrating towards the creation of a proper model, taking into account the protection of our identity, our needs, our wide natural spaces, etc. The possibility of harmonizing economic growth for the population in general with renewability of resources is a necessary goal of this development, and one that implies political, economic, industrial, and social changes. The urgent implementation of SEA is necessary to manage our natural resources.

328. (Paper)

**Health Impact Assessment: What We Should Do in Mexico**

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Environmental Impact Assessment initiated in Mexico in the mid-seventies. Throughout this period, impact assessment has placed greater emphasis on environmental issues related to physical, chemical, geological, and biological aspects of resources such as water, air, climate, soil, vegetation, and wildlife affected by development or modernization projects. Although social aspects are included in the corresponding EIA statements, they rarely give thorough consideration to impacts exercised upon potentially affected population. They tend to highlight the greater benefits of employment to be generated by the construction and operation of the new facilities.

Human health issues, in turn, are usually not taken into account, nor evaluated during the EIA procedure, due to legal, regulatory, and administrative constraints. This implies that health impacts derived from project development or terminated engineering works could be ignored. This oversight could well lead to the fact that projects authorized by environmental authorities, might be detained or even abandoned, because of social pressure and inconformity arising from their exposure to potential health problems or hazards.

The purpose of this paper is to analyze these constraints, and present proposals that appropriately address HIA and EIA procedures simultaneously.

502. (Paper)

**Public Participation in the North American Agreement on Environmental Cooperation**

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In 1994 the North American Free Trade Agreement (NAFTA) between Canada, the US and Mexico entered into force. NAFTA's environmental side agreement, the North American Agreement on Environmental Cooperation (NAAEC), created the Commission on Environmental Cooperation (CEC). Both – the NAAEC and the CEC – shall promote a trilateral cooperation on environmental aspects.

With articles 14 and 15, public participation is a central aspect of the NAAEC. Citizens, and non-governmental organizations from all three countries may send a "submission on enforcement matters" to the CEC, if they assume that one of the three countries is not effectively enforcing its environmental regulations. The CEC may establish a factual record on the topic in order to analyse the case.

The paper describes the procedure of the public participation. It presents examples of public submissions concerning the EIA.

The paper is part of a Ph.D. thesis at Berlin University of Technology and the Wuppertal Institute for Climate, Environment and Energy in Germany.

607. (Paper)

**Unsustainable Thinking: What Do We Need to Do to Truly Implement Sustainability Assessment?**

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Unsustainable thinking underlies society today. This is, of course, one of the compelling reasons why impact assessment was introduced in the first place, but, the evidence is that despite our efforts, global society is generally becoming less, rather than more, sustainable. How should we, as the IAIA community, respond to the growing crisis and how might sustainability assessment (or appraisal) become a tool for positive change? In this paper we argue that the challenges facing us demand new ways of thinking throughout all aspects of the assessment process. This includes new approaches to conceptualising development activities, new ways of engaging the public, new governance structures as well as new approaches to decision-making. We turn our lens onto IA practitioners (academics, consultants, industry and government) to consider how our current ways of thinking and approaching IA might jeopardise the progress towards sustainability. Our key concerns relate to the pursuit

of individual goals, 'silo' thinking and competition between practitioners where there is a compelling need for cooperation. We offer a vision of a way forward and look forward to vigorously debating the issues.

382. (Paper)

**Marbled Murrelet Initiative: Land Use Challenges Amending a Federal Habitat Conservation Plan**

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Washington Department of Natural Resources (DNR) and the US Fish and Wildlife Service are planning, under SEA, to devise a long-term conservation strategy for the marbled murrelet, a federally-listed species under the Endangered Species Act, while still allowing DNR to provide revenue for their trusts through timber sales. Challenges include the issue of known, or suspected, marbled murrelet habitat occurring in areas that are prime revenue generation for three of the most revenue-scarce counties. These counties depend on DNR for 45% or more in trust subsidies to help with public services such as schools, fire control, and medical responses. The counties are mostly rural in nature and unemployment is high.

Other challenges to provide good analysis include impacts to recreation: Off-road vehicles, hang gliding, and horseback riding, for instance. DNR must provide for multiple recreational uses on state lands. In the original Habitat Conservation Plan (HCP), one of the planning areas is managed as a whole, rather than zone-managed. This, too, challenges planners to provide reasonable alternatives that will achieve a long-term conservation strategy so that USFWS will allow an amendment to their HCP.

327. (Paper)

**Strategic Environmental Assessment: The Challenges of Rolling Up Separate Planning Efforts**

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Planning for governmental SEA includes reviewing how a plan affects future planning efforts down to the project action. Information gathered may also look at other agencies' planning to avoid conflicts and redundancies. The problem arises when other programs within the same agency move forward with plans that overlap or conflict with other program planning efforts. Coordination often is lacking because of different managers. Internal programs

often become so involved in outreach to stakeholders and other public entities, they often forget to involve other programs' planning efforts.

A mechanism needs to exist implementing how other planning efforts fit together. Policy managers must provide coordination for environmental assessment. This process will establish timing of planning processes and incorporate issues from other agency plans to reduce conflicting goals and redundancy. For example, in DNR's forest land plans which implement state forest policies, forest management includes not only silviculture activities but also land transactions (i.e. land exchanges), recreation, and protection areas for DNR's federal Habitat Conservation Plan (HCP). Recreation, transactions or HCP programs that develop long-range plans must understand how their planning fit within the overall forest land planning. This will reduce public confusion and distrust of government proposed actions.

285. (Paper)

**When the Urban Environment Encroaches on State-Managed Land: How Does the State Balance Interests?**

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Managing 2.1 million acres of state forest trust land to provide revenue for schools, institutions and local government services sometimes conflicts with other state laws like the Multiple Use Act that allows recreation use on state land. In addition, when the cities start annexing more county land, property owners get pushed up against state forest land. Issues such as timber sales disrupting views, or noise from off-road vehicles accessing state forest lands, cause conflicts between forest management activities and the urban residents.

State government must commit to additional information gathering early in the process to lay the groundwork for their planning and environmental analysis. In addition, public involvement early in the process is critical. Planning must include mitigation, including avoidance and adaptive management determined through appropriate information-gathering studies.

206. (Paper)

**Development and Use of Water and Land Resources and Its Eco-Environment Issues in Xinjiang of China**

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The area of Xinjiang Uygur Autonomous Region of China occupies 1/6 of the national territory, with a great predominance of resource exploitation and spatial development. Transferring water projectors is implemented step-by-step and new exploitation of water and land resources is beginning or will begin with rapid economic development of Xinjiang. This paper, summarizing development and use of water and land resources and its eco-environment issues in Xinjiang, points out that the exploitation of water and land resources in most regions of Xinjiang has obtained great achievement, but at the same time, has resulted in many eco-environmental issues. The reasons are because people did not well understand the particularity and fragility of the desert ecosystem and only pursued a short-term economical efficiency, then neglected the long-term impact on the eco-environment. This paper emphasizes deeply understanding the vulnerability of Xinjiang desert eco-environment, rationally exploiting water and land resources and paying attention to the conservation and building of the eco-environment.

652. (Paper)

#### **Question Topics Covered in a Rapid HIA Workshop**

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The practice of impact assessment presents many challenges, one of which is to collect information to inform the appraisal stage of the HIA. One of the common methods (among others) used within New Zealand is a rapid appraisal workshop, where information is provided to stakeholders beforehand and during the workshop, and then information is collected from them. A series of questions are possible to ask, but with limited time, which questions take precedence, and what is a good way to frame them? This paper presents the experience from several New Zealand HIAs, and will provide an opportunity for practitioners to discuss this approach and the reflect on the types of questions that they use themselves.

309. (Paper)

#### **Mainstreaming Conservation in Infrastructure Projects: Experiences from Latin America**

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Eight case studies from Latin America demonstrate how integrating natural habitat issues into the design, construction and operation of infrastructure projects can both substantially reduce the

associated environmental costs and create win-win results for conservation and development. These projects redefined the role of infrastructure development with regard to conservation. Good design, as well as innovative engineering construction and operational techniques, were devised specifically to avoid natural habitats, reduce the area of disturbed sites, minimize the magnitude and extent of unavoidable impacts, and mitigate remaining impacts. Project resources were mobilized to carry out habitat restoration, endangered species conservation, environmental education and awareness programs, identification of non-catalogued sensitive areas, establishment of new protected areas and/or strengthening existing ones along with the provision of management plans, co-management agreements, recurrent costs financing, personnel training, and provision of initial funds. Some of these actions involved more profound changes that included raising institutional environmental standards, revising legal frameworks and creating new divisions to address environmental issues. Leveraging funds from infrastructure projects can be highly effective in benefiting conservation efforts and also reduce costs for infrastructure projects by reducing resistance and increasing local support, and building capacity for infrastructure planning and implementation.

298. (Paper)

#### **Druzhba-Adria Case Study: Public Participation Success Story - Public Pressure and Alliances Against Poor Legislation and EIA as Legitimizing Device**

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Croatia is at the present harmonizing its EIA legislation with the EU Directive on EIA. The environmental NGOs are planning to start with education and mobilization of the public for the participation in EIA procedures.

In 2002 Croatia signed an agreement, without any EIA procedure, Parliamentary discussion or strategic assessment, with Russia, Ukraine, Belarus, Slovakia and Hungary to integrate the existing Druzhba and Adria oil pipelines in order to export Russian oil through the Croatian port on the Adriatic coast. Environmentalists opposed the project: Adriatic Sea is an enclosed and shallow sea and even a single spill would be devastating. Environmental NGOs started the campaign against that environmentally very risky project. The protest grew quickly; they succeeded in involving the public through manifestations, petitions, concerts, the Church joining the opposition, many VIP endorsement, etc. Such a huge public campaign never occurred in Croatia before. It developed in parallel to the EIA procedure. Even though both lasted over 3 years, the public has never participated officially in the EIA procedure. The Croatian legislation does not foresee public

participation until the very late stage of the procedure. That stage of PP was never reached in the case of Druzhba-Adria. Strong and long lasting public pressure and alliances against it resulted finally in 2006 in rejection of the project EIA Study. Poor legislation, political pressures, economic interests, and EIA as legitimizing device lost the battle against organized public opposition.

359. (Paper)

**Building Capacity for Biodiversity-Inclusive Impact Assessment in the Regional Context**

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Building capacity for upstreaming biodiversity in informed decisions related to development planning is perhaps the greatest challenge in most developing countries, primarily because the imperatives for economic development and biodiversity conservation can seldom be mutually compatible. Capacity building efforts are urgently needed at national and regional levels for bridging the development-conservation divide and for achieving the Millennium Development Goals.

The need for strengthening the knowledge capacity of countries in South Asia is clearly emerging. As a result, mechanisms for accelerating the human and institutional capacity-building for mainstreaming biodiversity in environmental assessment are also gradually evolving. The paper attempts to share approaches, impacts, and constraints of in-country capacity building efforts. The Indian experience makes it amply clear that for secure, stable, and sustainable structures for upgrading the capacities, the target groups must include EIA professionals, academia, investors, decision-makers and most importantly, the biodiversity managers.

As the focus is enlarging to develop regional capacities, the need for developing best practice guidance tools to promote learning and its application has been well perceived in South Asia. The best practice guidance document that has been recently developed for South Asia is one specific output of the concerted efforts in this direction.

405. (Paper)

**Economic Growth vs. Environmental Protection**

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Economic growth is vital for developing countries; but if it does not protect the environment it could lead to pollution of land and water resources, desertification, climate change, and other environmental problems.

The government of Botswana in its bid to promote sustainable development has accepted the significance of EIA as a tool for guiding development and managing the environment. The EIA Act was passed by parliament in March 2005 and brought into force in May 2005. However, many developers still feel EIA is a hindrance or delay to the development process and they carry it out as a legal requirement rather than an act for environmental concern.

Therefore, developers and the public in general need to be taken on board on issues of environmental concern to help harmonise economic growth and environmental protection.

The purpose of the paper is therefore to seek views from other participants on how people or developers can be made to appreciate tools for environmental management such as EIA and SEA.

Intended outcomes: a strategy for environmental awareness in developing countries and monitoring strategy so that environmental concern does not end with the implementation of the project.

313. (Paper)

**EIA Monitoring**

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Thermal power plants worked with coal are considered the biggest air polluters in the central region of Mongolia. Therefore, according to the Energy Law of Mongolia, terms and requirements and standards of Licenses regarding environmental protection that are issued by Energy Regulatory Authority should achieve the international standards to pay attention to implementation of the Environmental Protection Plan and control of its costs in the technical and economical basis of hydro power plants and other energy resources that are being constructed at the time, and to take initiative in developing legal basis which are aimed to decrease environmental impact

222. (Paper)

**Integrating IA into M&E Systems**

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Project monitoring and evaluation systems most often confine their scope to a project's progress in terms of providing the required inputs and ensuring its translation into outputs. At best, some project M&E systems attempt to identify interim outcomes, but impact identification and measurement are seldom built in as part of the M&E system. As a result, ex-post impact assessments are hard to come by and funding for such activities is at the mercy of donors who might be interested in funding similar projects.

However, impact assessments should play a larger role in project implementation in terms of bolstering public accountability and instilling implementers' commitment to project goals. Were the resources used in the project translated into the desired impacts? Given that impact assessments can be costly, greater advocacy is needed in order for decision-makers to fully support and allocate funds for this purpose. Alternatively, smaller scale impact assessments can be done by project implementers, in which case, project staff's capabilities need to be enhanced. This paper discusses issues and challenges in integrating IA into project M&E system.

233. (Paper)

**In Search Of The Holy Grail – Exploring Causality In Strategic Environmental Assessment (SEA)**

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Internationally, a growing body of literature has emerged on the quality as well as the effectiveness of SEA. However, very little research has been conducted to determine causality between 'input quality' and 'output effectiveness.' This paper explores causality in SEA through the application of a performance evaluation review protocol to selected SEA case studies within the South African context. The approach to the research could be described as structured and deductive, following and testing particular lines of enquiry in the form of performance indicators. This approach proved to be particularly successful in firstly identifying 'patterns' in performance across cases and secondly highlighting 'correlation' between 'input quality' and 'output effectiveness.' However, it became apparent that the research methodology did not deal well with causality and that there is also a case to be made for less structured and inductive approaches to performance evaluation. Such approaches would potentially be more risky and time consuming, but might also provide an opportunity to more successfully pursue what could be considered the 'holy grail' of performance evaluation, which is to develop plausible explanations of causality.

723. (Paper)

**Avoiding Extinction – Proving the Business Case For IA & IA Practitioners**

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Value is often defined by four tests – was it noticed, was it accepted, was it effective and was it done for the common good? Whilst few debate the latter in respect of IA, economic and political agendas have placed increased pressure on IA practitioners to demonstrate 'added value' in development. An area of particular concern is how practitioners justify EIA costs against its resultant direct and indirect benefits. To date there is limited empirical research in this area, as the needs to meet regulatory standards have obscured research regarding IA 'value.' This paper explores the case for IA 'value' in three geographical business contexts (UK, Australia and South Africa). Cost savings through project management, risk intervention strategies and design alternatives directly attributable to IA intervention are identified. The methodology uses selective surveys and case studies to examine issues and experience. We conclude that significant savings can indeed be realised for a range of different types of projects within all three geographic regions. This suggests that environmentally friendly design makes business sense and that IA is an internationally proven mechanism to achieve cost savings by informing good design. We propose further avenues for exploring the cost of IA.

395. (Paper)

**Environmental Conflict Management and Impact Assessment in Korea**

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The rapid economic development and industrialization that started in the early 1960s in Korea has resulted today in booming economy and improved standard of living. During the economic growth, however, serious environmental pollution and degradation of natural ecosystems followed.

In the course of economic development, Korea has been confronted by various social and environmental conflicts which have brought about serious economic losses and social insecurities. The

root causes of these environmental conflicts are changes in people's perception on environmental valuation, extended roles and activities of environmental NGOs and citizen's group. Environmental conflicts include conflicts among stakeholders; government agencies, environmental NGOs, citizen's groups, etc.

Current systems of environmental conflict management are environmental dispute resolution system, environmental impact assessment, and prior environmental review system. Despite these systems, however, there continues to be serious, long-lasting, and highly controversial environmental conflicts, creating conflicts among government, citizens, NGOs, etc

To resolve these conflicts, there are needs for establishment of reasonable environmental conflict management system and creation of climate to observe the principles of environmental conflict management. Institutionalization of effective environmental conflict management systems, together with research and development, education and training should be conducted.

589. (Paper)

**Lotic Community Prediction Model Responding Environmental Change (LOCOPEM)**

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The necessity for developing a holistic assessment tool for aquatic ecosystems has been increased recently. To satisfy this need for more objective decision-making tools to assess comprehensive biodiversity for the Korean stream ecosystem, a simulation model named "LOCOPEM" has been developed as lotic community prediction model (prototype) responding environmental changes in aquatic ecosystems. The variables of the LOCOPEM were screened and selected by using statistical methods. The input layer of LOCOPEM consists of four major factors, which are characterized by the stream ecosystems' traits, such as physical, chemical, biological and riparian data. Simulation results are presented in terms of "Ecosystem Diagnosis" that contains the prediction outputs of biodiversity compositional changes (table form), community stability (diagram form) and degree of stream urbanization/disturbance (index form). The comprehensive assessment can be summarized in a sheet of report form that provides more additional information of aquatic ecosystem structure and function responding environmental changes. The result showed that the prediction precision for diversity was ranged from 100% (highest) to 62% (lowest). The model prediction was very precise for the rivers whose volume (scale) is not large. The strength and weakness of the model

will be discussed in presentation of the conference in detail.

349. (Paper)

**Environment and Health Impact Assessment of Pesticides Use for Public Policy Decision Support in Local Level**

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The objective is to apply tools for decision making support in public policy process of pesticide use in local level. The method was done by arrangement of learning process regarding environment and health impacts from pesticide use for stakeholders and local policy makers. The result found that the participants summarized that pesticide was a crucial factor to induce various impact problems. Methods to solve these problems should be to reduce and quit the use of pesticide. A study tour was arranged to study the best practice that could reduce and quit the use of pesticide. After that the participants were assigned to do community planning by setting the vision that would be free of pesticide with the strategy to rehabilitate natural resources and environment, free pesticide farming, participatory self reliance and rehabilitate local wisdom and culture.

The lesson learned found that the learning process base tool helped farmers and policy makers to understand the relationship between health and environment impact with pesticide use without necessity to prove by scientific evidence base data. This limit could be overlooked if the stakeholders and public policy makers could perceive the significance of impacts occurred to way of life of people in the community.

337. (Paper)

**Assessing Community Views about Mining Town Developments Using the Choice Modelling Technique**

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A key issue in managing the development of mining towns is assessing the tradeoffs that communities might consider as being desirable. Mining communities can be susceptible to uneven growth patterns, more transient populations, and the direct impacts of being close to mining operations. However, they may also generate high levels of income and employment in a regional area. The research reported in this study involved the assessment that residents faced in Moranbah, a coal mining centre in central Queensland, Australia. The town faces substantial growth pressures and constraints associated with the coal boom from 2004. To assess these, a random selection of households in the community was invited to complete a series of choice exercises about different development options for the town. By using changes in household income as a tradeoff, some assessment of the community values for different development pathways has been assessed.

648. (Paper)

#### **Overview of Independent Oversight Agencies**

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Independent oversight agencies, such as the Independent Environmental Monitoring Agency for the Ekati Diamond Mine, have become fairly common in northern Canada. They provide benefits to various publics affected by development projects; indeed it is these publics who demanded the oversight agencies be created in the first place, to help assure good environmental management during the operation of the developments. But the oversight agencies also offer benefits for project proponents and for government agencies as well. These benefits will be discussed with a view to getting feedback from others.

The ideas presented are based on ten years serving on the Independent Environmental Monitoring Agency and having exchanged ideas about such agencies with many of the stakeholders. I will also report on some changes that are in the works for the agencies in northern Canada.

543. (Paper)

#### **An Integrated Operation of Multi-Regional Water Supply Networks for an Optimal Water Allocation in a Metropolitan Area**

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Recently it was considered that the water disparity in a field of demand and supply is due to the difference between the design water demand and the present one in a multi-regional water supply network project.

This study is to seek an optimal water allocation model to meet two conditions: that one is to minimize the electric cost to supply water demanded from customers and another is to minimize the water shortage against the water demand. The optimal solution by the model is taken using a linear programming (LP) algorithm on a hydraulic water distribution condition of integrated operating water supply systems which are located in short distances.

The optimization model developed is applied to the existing inter-regional water supply networks within short distances. As an application result, it is found that a well-allocated water supply scheme can promise to save electricity cost and satisfy all operational goals such as stability and revenues during the period.

444. (Paper)

#### **The Development of Environmental and Social Programs for a Major Infrastructure Project - Processes and Successes**

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As a follow up from "Lessons Learned from a Private Corporation Perspective," this paper will outline some of the Project's successes, from an Environmental and Social viewpoint, as an example of how multiple Lending Institutions, Quiport and the Municipality of Quito overcame differences and priorities to provide a major infrastructure project for a developing country.

In particular this paper will address the following, from Quiport (Project Sponsor's) point of view:

- The 2 EIAs produced for the New Quito International Airport (NQIA) – one locally, one for Lenders purposes;

- The Ravine Monitoring Program at the NQIA – a result of deficiencies in the EIA for the Lenders but not a local requirement;
- The Environmental Site Assessment process at the existing Quito airport – not a requirement by Municipal authorities;
- Social Management Plans for both airports – a requirement by the Lending Institutions and again not a local requirement;
- Environmental and Social Action Plans introduced for both airports - contractual requirement introduced to achieve financial close, and the difficulties Quiport has in achieving compliance to avoid default situations which could withhold disbursements, well after financial closure.

This paper will present, using the benefits of hindsight, some of the common successes for all Project participants.

443. (Paper)

**The Development of Environmental and Social Programs for a Major Infrastructure Project - Lessons Learned from a Private Corporation Perspective**

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The development, construction and operation of a new greenfield airport in Quito, Ecuador, has been undertaken by Corporacion Quiport S.A., a private enterprise owned by international companies. Quiport, as part of the concession awarded by the Municipality of Quito, is responsible for the operations and maintenance and upgrade of the existing Mariscal Sucre International Airport. The project required financial loans from four Multilateral Financial Institutions (MFIs): IADB, OPIC, EXIM Bank of America and EDC Canada. The Environmental Impact Assessment process began in 2002 and since then environmental and social pre-requisites have been expanded to include many requirements and investment not initially anticipated by Quiport.

This paper will discuss lessons learned in the development of environmental and social programs for both airports. The intent is to highlight the

environmental and social process challenges that were encountered leading up to financial close so that proponents interested in pursuing similar financing for projects can maximize their EHS processes. Inter-related issues involving the Project proponent will be discussed, for example a) internal and external lines of communication, b) reactive versus proactive mentality, c) the local national versus required EHS culture, and d) lack of appreciation of MFI environmental and social requirements.

324. (Paper)

**Economic Growth and Impact Assessment in the Building Sector: Improving the Knowledge of Input and Output Material Flows During the Life Cycle of Buildings**

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Economic growth is associated with construction, demolition or rehabilitation of different kind of buildings (fabrics, commercial centres, dwellings, etc.). Environmental problems we are facing today are a result of society's processing of materials. Regrettably, the building industry is the greatest consumer of the world's natural resources. In the same way, this sector is one the biggest generators of construction and demolition waste. For these reasons, it is necessary to estimate and deal with environmental impacts which are provoked by this economic activity. The environmental assessment of this sector requires the knowledge of flows of materials and components associated to this activity.

This article starts with the state-of-the-art research on building material flows. Afterwards, we introduce a new method which allows in one hand traceability of building components and on the other hand long term forecasting of construction and demolition waste. In the same way, main results from the first application to one building are presented. Additionally, we discuss the drawbacks for finding relevant information. Finally, we explain how traceability and forecasting of building components and materials will facilitate LCA; how this information will help to set up eco-design in the building sector.

535. (Paper)

**An Evaluation of Recent SEA Practice in Brazil**

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Despite a firmly grounded twenty-year experience with project EIA in Brazil, SEA has ranked low in government priorities. Only recently have a few reports been labeled "strategic assessments," but no regulations or guidelines govern their preparation. This paper reviews three such studies on (1) seashore oil and gas exploration and production, (2) hydroelectric schemes in the Western Amazon, and (3) road development in São Paulo metropolitan area. These reports were intentionally selected to cover different kinds of plans or programs and different geographic locations. The research aimed at seeking common features among these studies and at verifying adherence to (i) IAIA's SEA performance criteria, as there are no domestic yardsticks to assess compliance, and (ii) coverage of the main elements of the SEA process.

In the hydro and road cases, the main drivers for SEA were the difficulties in obtaining project approval and SEA was intended as a facilitator; these studies were undertaken by the projects/programs proponents. On the other hand, the oil and gas study was aimed at zoning an offshore sector to protect biodiversity, and actually influenced decision-making, as the federal government declared an exclusion zone for oil and gas activities.

725. (Poster)

**Comparative Matrix of Environmental Assessment in Latin America**

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The poster is a snapshot of the different Environmental Impact Assessment (EIA) Systems that have been adopted in twenty Latin American countries. For each country, the poster summarizes the information of 17 variables that define the main characteristics of the EIA system. With this wealth of systematic and concise information, the poster illustrates the diversity of approaches that currently shape EIA policy and practice in most Latin American countries.

724. (Paper)

**A Comparative Analysis of Environmental Impact Assessment Law, Policies, and Practices in Latin America**

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This is a comparative analysis of the Environmental Impact Assessment (EIA) Systems adopted by twenty Latin American countries. The analysis focuses on the differences both among the countries in the region and in comparison with the EIA system adopted by the United States, which was the first country to introduce the use of EIA in its contemporary sense.

The analysis finds that the nature of EIA in most Latin American countries differs from that of the US. In the latter, EIA has been used to incorporate environmental and social concerns of different stakeholders into the decision-making process of federal authorities. In contrast, most Latin American countries have used EIA to establish command and control regulations that have not been set in norms or standards but that are nevertheless considered necessary to address the environmental impacts of investment projects.

The paper further assesses differences in roles and responsibilities of project proponents, authorities, and communities throughout the EIA process. The analysis finds that such differences, which largely stem from the diverging conceptions of EIA, have a substantial impact on whether EIAs are valuable tools that help authorities to address complex social and environmental issues or simply bureaucratic hurdles for project development.

752. (Paper)

**Introduction of Case with a Series of Environmental Consideration from Location Selection to EIA in a Certain District in Japan**

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This is an introduction of case where environment is considered from the location selection stage to EIA with design engineering in a certain district in Japan.

172. (Paper)

**Trial of SEA in Project Approval in Lao PDR**

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Committee for Planning and Investment (CPI) has installed a new comparative project assessment system in project appraisal. The evaluation items are not only the environment but also poverty reduction, education, economic, and urgency. By the comparative evaluation table, CPI can prioritize the projects from A to C. The evaluation system is supported by absolute project evaluation, project digital filing, chronology table and mapping. In the development stage of the comparative evaluation, we referred to the SEA concept. Although this evaluation is not supported by regulation, it has been almost agreed by CPI. In the future we are going to suggest including the SEA concept in program planning and preparing program planning guidelines in cooperation with other ministries.

384. (Paper)

**Assessing the Social Impacts of Changes in Fisheries Policy: A Review of Recent Australian Experience**

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Fisheries policies worldwide are changing rapidly as the problems of overfishing become apparent and competition for marine resources increases. Many governments are implementing policies which alter or reduce the access fishers have to fish stocks. Increasingly, some form of social impact assessment (SIA) is undertaken as part of the process of developing mitigation policies to help fishers adjust to changes in resource access. However, SIA methods have commonly been developed to apply to land-based resource changes. They tend to assume a fixed community, rather than a mobile and shifting community. This paper reviews a number of recent studies undertaken in Australia and identifies the new approaches that have been developed to better assess the impacts of changes to fisheries policy. The paper includes a discussion

of designing appropriate methods for consulting fishers, for gathering data on fishing businesses, and for analysing the spatial distribution of impact of changes to fisheries policy. Continuing challenges are also highlighted. The paper concludes by identifying how the lessons learned in Australia may be applied more broadly.

388. (Paper)

**Using SIA to Develop Structural Adjustment Policy: Improving the Dialogue between SIA Practitioners and Government**

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In the Australian government, social impact assessment has been used as part of the process of developing structural adjustment policies for the forest and fishing industries in recent years. The experience of using SIA to inform structural adjustment has been varied, but some common themes have emerged. This paper uses case studies of structural adjustment in the Australian fishing and forestry sectors to identify the needs and priorities of government decision makers when designing structural adjustment packages, and compares these needs to the content of the typical SIA. Suggestions are then made for enlarging the interface between SIA and policy development, both by improving the understanding of the potential of SIA in government, and improving how SIA practitioners undertake and communicate SIA to those in government. The paper is largely based on the author's experiences while working as an SIA practitioner in a government research agency.

387. (Paper)

**Participatory and Technocratic Approaches to IA: Getting the Best of Both Worlds**

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The call for more public participation in impact assessment has existed for as long as IA has been a recognised field. Numerous guides provide multiple methods for implementing meaningful approaches to public participation. However, the use of public participation has not been extended into all arenas of impact assessment, with what are commonly labelled 'technocratic' approaches tending to leave out public participation. This paper argues that it is both possible and desirable to combine participatory and technocratic approaches, and demonstrates this using a case study of IA of rural land use change in Australia. In a typical technocratic IA, land use change would be analysed by producing statistical data quantifying the extent of land use change over time. In a participatory IA, land use change is typically analysed by asking

people's perceptions of the changes occurring in their local area over time. Both approaches have limitations. By combining both, it is possible to 'ground truth' statistical data and interpret it more meaningfully than occurs in the typical technocratic approach, while incorporating iterative learning cycles into the participatory approach that assist participants in designing strategies for adapting to change.

580. (Poster)

**Integration of Environmental, Social and Economic Indicators for Land Use Assessment**

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Land use is a key pressure translating economic, political and other driving forces into environmental impacts in rural landscapes. In Europe land use policy making is devoted to the principle of sustainable development, which is linked to multi-functionality. The rationale addresses interdependencies of social, economic, and environmental effects of land use.

The EU Integrated Project SENSOR ([www.sensor-ip.eu](http://www.sensor-ip.eu)) develops ex-ante Sustainability Impact Assessment Tools for land use in European regions. Spatially explicit, policy-driven land use activities are considered, including agriculture, forestry, tourism, nature conservation, transport and energy infrastructure.

This poster reports on the methodological design for ex-ante, indicator based analysis of land use impacts. About 60 indicators are integrated into a

system of nine land use functions. They include provision of abiotic resources, support and provision of habitat, maintenance of ecosystem processes, industry and services, land based production, provision of infrastructure and work, human health and recreation, landscape identity, scenery and cultural heritage. They imply those functionalities of the environment that are affected by land use and that provide goods and services to society. The characterisation of land use functions shall offer an entry point into stakeholder based valuation of land use impacts on sustainable development pathways.

455. (Paper)

**Preliminary Study of Strategic Environmental Assessment with Fish Investigation for Dam Construction Long-term Plan**

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Dams have been constructed to deal with flood control, drinking water, agricultural/industrial water source, and to optimize the value of water resource. However, developed countries have concern about impairment of the natural environment due to physical, chemical, and biological changes after dam construction. Therefore, strategic environmental assessment on a dam construction's long-term plan was recently discussed in a policy-oriented group in order to select the priority order of dam construction based on a feasibility study in environment and ecology. Because some fish, adjusted to lotic condition in streams and rivers, require specific habitat characteristics, they move upstream of the watershed or some of them may become extinct species due to inappropriate habitats when a dam is built. We investigated fish fauna on 12 prospective dam sites, and focused on five different matrices. Each matrix was scored one to five, summed up, and then divided into five ranks. According to the results, four dam sites were classified into the fifth rank indicating ecologically important area on fish, and three of them belonged to Han River watershed. The study provides an ecological value on the prospective dam sites, and should be considered with other environmental fields.

549. (Paper)

**Biodiversity Conservation for Endangered Species of Fish in the Lower Reaches of the Demilitarized Zone (DMZ), North Han River, Korea**

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The military demarcation line (MDL), which is called the 38th parallel in Korean, has been a matter of common interest in the world since the end of the Korean War in 1953. Many international scientists have discussed the ecological importance of the demilitarized zone (DMZ) because the area comprises 2km of the southern and northern parts of the MDL which have been secured for a long time. The Pyeounghwa Dam located at 10km lower than the MDL was constructed in 1988, and extension work (dam height: 80 to 125m) was done in 2005 in order to control primary flooding. We investigated fish communities in the lower reach of the DMZ, North Han River, and found 41 species containing 4 endangered species. Among them, Korean endemic species were 18 species (43.9%), which was much greater than mean value (25.9%, Kim 1995). The fish fauna indicated that the area had high biodiversity and good habitats for those endangered species. Especially two endangered species, *Hemibarbus mylodon* and *Siniperca scherzeri* (Albino type) are classified as natural monument species, and they are protected by government law. Therefore, it is important to monitor and conserve their population and habitats in future.

544. (Paper)

**Model Selection for Predictive Species Range Mapping**

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Many approaches have been developed to determine optimum models for predicting species' ranges for conservation and biodiversity action planning. This research developed 3 multi-predictive models for species range mapping using 9 tree species classified by broad, intermediate, and narrow species range types with presence/absence points in California. Predictive variables included 6 bioclimatic attributes and 5 soil attributes. The first model was based on 5 individual models (GAM, GLM, GBM, CART, ANN). The second was a probabilistic model based on Bayesian decision rules to examine the impact of including static environmental predictor variables such as soils maps in combination with dynamic variables such as climate on the identification of potential range. The third was a consensus model based on PCA to reduce the uncertainty of predictive range mapping using a variety of individual model outputs. We compared these approaches and quantified model performance and the difference in selected range for each species. Our results showed that 1) GBM was the best model among 5 individual models, 2) Bayesian model improved model performance and predicted realistic species range compared to individual bioclimatic and soil model, and 3) Consensus model was a reasonable approach to reduce the uncertainty of individual model outputs.

348. (Paper)

**Restoration and Monitoring of Endangered Fish, Black Shinner (*Pseudopungtungia nigra*) in the Upper Reach of Gap Stream**

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The objectives of this study were to investigate fish communities in Geum River, to select species for restoration in the watershed, and to establish a management plan of restoration and conservation. After we compared investigation data of fish communities between prior to 2000 and 2002-2004, we decided to restore the representative endangered species in Geum River watershed, black shinner (*Pseudopungtungia nigra*). About 14,000 fingerings of the species were produced successfully by a fish culturist in 2005. At the same



time, several thousand Korean aucha perch (*Coreoperca herzi*) fingerings were produced because their spawning habitats seem to be used for black shinner's. On 5 October 2005, both fingerings were released at proper habitat in the upper reach of Gap Stream. In order to monitor their survival, movement, and growth rate, field investigations with underwater shooting had been performed in 2006, and we found some black shinnners with good nutritional condition, compared to those just prior to their release. The results indicated that they were restored at the adequate site, and systematic monitoring on their survival, health condition, and natural spawning should be followed in future.

785. (Poster)

**Role of SEA in Post-Tsunami Reconstruction in the Maldives**

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Following the 2004 tsunami in the Indian Ocean, major reconstruction programmes were planned for all the severely affected countries. However, it was clear from very early on that effective management of these programmes would be improved by the use of strategic environmental assessment, to avoid future social and environmental problems from reconstruction, and to maximise the benefits.

This paper presents the main results of a Masters study into the potential for using SEA within the context of reconstruction programmes in the Maldives, using the Safe-Island concept as a case study. The research looked at the development of this concept, in relation to national development planning, and investigated the main barriers to potential implementation of SEA at the present time in the Maldives.

591. (Paper)

**Public Involvement of English Style in the Process of Regional Spatial Strategy Development - Focusing on the South East Plan**

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Strategic Environmental Assessment (SEA) is one of the effective tools for realizing sustainable development, and it is widely recognized that integrating SEA into the planning system is crucial for improving its effectiveness. One of the more challenging parts for SEA application, contrasting to EIA, is that exquisiteness of the planning system influences the effectiveness of SEA. Sufficient assurance of public involvement has to be the stem for an effective SEA-integrated planning system; otherwise the system will be utilized for justification.

In Japan, SEA has not been applied for a national plan yet, while some of the proactive local governments have applied SEA type systems prior to developing a detail project plan. In contrast, a new planning system and SEA system have been applied for England since 2004.

It must be worthwhile to analyze a practice of the SEA-integrated planning system in terms of the public involvement including the context behind it for the purpose of considering how a meaningful SEA system would be applicable for Japan. This study focused on the Southeast Plan led by Southeast England Regional Assembly and aimed to identify the degree of procedural justice and the reasons for that.

759. (Poster)

**Prediction of Reservoir Water Quality Before Dam Construction Using Algal Growth Potential Test (AGPT)**

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Overview of prediction of reservoir water quality before dam construction using algal growth potential test (AGPT).

757. (Poster)

**Long-Term Monitoring of Aquatic Environmental Changes During Dam (Yongdam) Construction Project**

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Overview of long-term monitoring of aquatic environmental changes during dam (Yongdam) construction project.

761. (Poster)

**Ecological Impact Evaluation in the Downstream of Regulated River System**

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Overview of ecological impact evaluation in the downstream of regulated river system.

750. (Paper)

**Social Impact assessment of the Limestone Mining Industries in Local Communities of Korea**

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Limestone mining industries have played the important role of developing country and local

communities in Korea. On the other hand, various damages such as destruction of mountains and forests, emission of air pollutants, and so forth have occurred in local communities. The social impacts were assessed by using the inhabitants survey.

397. (Paper)

**Knowledge Integration Approach for Sustainability Policy**

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Assuming that each basic discipline of the academia - whether chemistry, ecology, sociology, geology, economics, engineering, and politics - cannot in isolation provide the sufficient and necessary solutions to a complicated problem of sustainability - whether climate change, desertification, deforestation, fisheries, and EIA, this paper attempted to construct an integrated knowledge approach to sustainability policy by testing the necessary complementarities of three functional modes of knowledge of sustainability (contextual, technological, and reconciliatory knowledge) in completing the policy science of sustainability in the field of EMS. By conducting three triangulated surveys (green motive, green technology, environmental policy for business), this tested qualitatively the effectiveness and efficiency of a knowledge integration approach to cleaner production implementation policy. It concluded that the essence of the integrated knowledge approach to sustainability is to generate the art of stewardship for building a sustainable society. Being provided with massive amount of data, information, opinions on certain sustainability issue, if a society is not preceded by the knowledge synthesis processes for sustainability, highlighted by the proposed, triangular knowledge cycle of sustainability, the society would not gain its continuous momentum to move towards a sustainable society. Therefore, this helps to develop the foundation for the policy science of EIA.

677. (Paper)

**Assessing the Economic Benefit of Natural Preservation from Marine Protected Area: A Case Study of Saeng-Do Island, Busan**

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In order to evaluate feasibility of a designating marine protected area (MPA), it is inevitable to consider economic benefit from the designation. This paper presents a model case study for the estimation of conservation value from MPA. The

major objectives of this study are to assess the conservation value of Saeng-Do Island in Busan, improve theoretical aspect in valuation method, and then present policy makers and stakeholders with adequate information about MPA in terms of monetary value. To this end, contingent valuation method (CVM) was applied to estimate the non-use value that would follow from the designation of a Saeng-Do MPA. The CVM survey was designed to comply with the guidelines for best-practiced CV studies. We surveyed a randomly selected sample of 400 households in Busan and asked respondents questions in person-to-person interviews. Respondents understood the contingent market and were willing to pay 2,473 to 3,340 Korean won (approximately USD 2.6 to 3.5), on average, per household. The household values can be the benefits that ensue from the MPA program and compared with the costs of the program to determine whether the program is economically desirable.

758. (Poster)

**Rapid Trophic Classification of Streams Based on Microalgae Biomass in Strategic Environmental Assessment**

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Overview of rapid trophic classification of streams based on microalgae biomass in strategic environmental assessment.

191. (Paper)

**Environmental Management Plan for CBM Exploration and Development in Damodar Valley, India**

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Coal Bed Methane (CBM) has emerged as a valuable energy source. Recently in India, exploration studies have been initiated to commercially exploit the methane trapped in coal beds. Despite being an environmentally friendly

source of energy, several issues need to be addressed in order to understand environment impacts during its exploration. Damodar Valley is presently being explored and developed for tapping methane from coal bed. The present paper discusses the environment impact studies carried out in this area. Baseline data on different environmental components on water, land, noise, biological and socioeconomics have been collected and analyzed. Based on site-specific conditions and technology used for development drilling, environmental impacts arising out of this activity have been predicted and a suitable environmental management plan is proposed in order to mitigate the adverse impacts arising out of this proposed activity.

195. (Paper)

**Appropriate Assessment Practices and Reports in Finland**

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In Finland the assessment procedure required by the Habitats Directive Article 6(3) includes two parts: 1) preparation of an Appropriate Assessment (AA) report concerning impacts on a Natura 2000 site by a project proponent or authority preparing a plan and 2) a statement of a regional environment centre. Only after receiving the statement an authority giving permit or approval can accept or reject the project or plan.

The 71 AA reports and 72 statements were reviewed in two phases. Compared to the 1997-2001 review, the later 2001-2005 review showed progress over time in description of the project or plan and its environmental stress, effects by individual habitat types and species, cumulative impacts and mitigation. The most severe deficit is still the lack of verified data since the studies included only few or none field days.

The results indicate that AA reports do not provide an adequate basis for decision making but the input of regional environment centres is essential. Only 42 percent of the cases AA reports and statements shared the same conclusion. Often mitigation of effects was seen insufficient by the centres and additional measures were set for acceptance of the project or plan.

721. (Paper)

**GIS-Based Assessment of Carrying Capacity and Spatio-Temporal Visitor Management for National Parks: Focusing on the Mt. Chiri National Park in Korea**

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Korea has been experiencing an increasing recreational demand. This recreational demand tends to be also concentrated to specific time (weekends), site (national parks), and season (summer). By excessive use by too many visitors in specific parks, places, times, natural and cultural resources can be degraded. These negative impacts have been forcing us to consider how much use or human impact can be accommodated in a park. With this consideration, lots of efforts for determining the optimal level of use have been made till now. That is, much effort has been placed on the carrying capacity. Our approach was focused on the dual purpose: ecological stability and experience quality. And we incorporate two values, that is protection value for ecological stability and attraction value for experience quality. Protection value was evaluated and graded using GIS-based analysis with factors of biological and physical sensitivity. Attraction value was evaluated and graded using GIS-based analysis with factors of facilities and attractive sites. Site-based management grade was derived through comparing protection grade with attraction grade. We tried to find ways to solve the conflict through comparing both values and to suggest site based visitor management strategies.

668. (Paper)

**Establishing SEA Guideline for Environment-Friendly Water Resources Development**

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Korea has implemented the Prior Environmental Review System (PERS) since 1993 in order to review possible impacts of projects on environment. The PERS as an institution has improved over the years and it was amended in 2006 so as to have same influences as SEA. Despite these improvements, there have not been enough cases to test effectiveness of the PERS. In addition,

because of insufficient development of assessment tools, it is too early to expect for the PERS to take effect successfully.

So far, water resources development has been dominated by supply 'efficiency' and 'cost-benefit' analysis from the planning stage. Consequently, environmental considerations have been relatively neglected. Lack of guidelines, by which decision-makers can depend on, made matters worse. Therefore, this study examines water resources development from planning to implementation stage to find what environmental considerations should be taken in each stage and suggests an SEA tool in respective stages. The main research findings are as follows: 1) analysis of water resources development plans, 2) review of environmental considerations on water resources planning, 3) development of environment-friendly water resources planning tools, and 4) development of SEA guideline for environment-friendly water resources development

167. (Paper)

**Capacity Building for Impact Assessment: Lessons and Experiences from Tanzania**

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The various components of impact assessment such as strategic environmental assessment have become powerful instruments that can assist decision-makers, corporate bodies and the general public to integrate economic, environmental, social, policy, cultural concerns in development policies, plans, programmes, projects and other major decisions at an appropriate stage of development/planning cycles.

These instruments can be effective if several factors are in place. One of these factors is capacity to understand, handle, undertake and use relevant instruments at the right time and in a manner that would enhance sustainability. Many countries that have introduced impact assessment in their systems are grappling with this issue. In Tanzania, impact assessment is over 20 years old and yet the practice is facing many challenges.

This article explores various elements that form capacity building efforts in Tanzania and examines the challenges and experiences so as to address the numerous bottlenecks that capacity building for impact assessment is facing. The term capacity building is understood broadly to include formal training and institutional strengthening that includes institutional set up, defining roles, mandates and rules; awareness among policy makers and awareness among and within the public on the role, functions and importance of impact assessment.

389. (Paper)

**Urban Development and Impact**

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Since 1995, Tirana, the capital of Albania, is characterized by rapid development, and on the other hand rapid urbanization pressure and disordered expansion of the urban zones, which are associated with many problems, conflict and contradictions.

In order to best discipline this boom of construction, the following is necessary:

- Wider knowledge of city planning, legislation and the rule of city planning.
- Development plans, which must be guided by a detailed impact assessment ( IA ), to identify the direct impacts of project activity, and rehabilitative measures in case of pollution as well as their cost.
- Consideration of basic standard of density and extension, in order to make sure that canalizations and the local roads will be constructed.

Thus, the primary request is to promote the principle that a public advantage in controlling developing levels exists, and the concepts of city development, traffic problems, qualitative development and a better environment for everyone.

135. (Paper)

**Revising the Regulation of Project Approval for EIA in Lao PDR**

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Committee for Planning and Investment (CPI), has prepared to change the regulation and procedure of project approval suitable for EIA. CPI is the organization which level is same as ministry and be responsible for all the Public Investment projects' approval in Lao PDR. Current Regulation 918, which stipulate the rule and procedure of project approval of Public Investment, did not go along with EIA regulation. Last year we reached an agreement with Science Technology and Environment Agency, the responsible agency of EIA law, concerning about the overall procedure among CPI and project owners. This year CPI decided to add some statements in the regulation, such as "any project that has no Environment Certificate can not be approved," the "project which needs EIA must include EIA cost in total budget," and so on. Now CPI has developed the new project proposal formats and training material. National Assembly will approve this regulation in 2007.

249. (Paper)

**Navigating the Maze: Coordinating Multiple EA Frameworks for an International Transportation Project**

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The Detroit River International Crossing (DRIC) Project is a coordinated effort by Canada, the United States, Ontario and Michigan to examine options for adding border crossing capacity in Windsor-Detroit.

This international border crossing is critical to the local, regional and national economies. However, planning new transportation infrastructure of this magnitude is complex, as the study must meet environmental requirements of several jurisdictions.

At IAIA 06, I presented the DRIC study, focusing on public participation. For 2007, I propose to provide an update, focusing on the study's efforts to address the multiple legal frameworks in a coordinated public process. In the past year, the Canadian team has taken innovative steps to integrate requirements under the Canadian federal legislation with the provincial process, necessitating a much earlier application of the federal process than usually occurs.

The paper will highlight differences in the legal EA requirements in Canada, and challenges in addressing them in a public process. It will describe steps taken to date, and use lessons learned and comparisons with other jurisdictions as a basis for proposing options for future consideration. A key theme is that early application of the CEAA process is integral to effective coordination with other jurisdictions.

719. (Paper)

**Assessing the Spatial Dimension of Sustainability in Ho Chi Minh City**

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Megacities of tomorrow like HCMC offer exceptional opportunities to analyse both the impacts of large-scale environmental resource problems and institutional responses to these impacts, as well as urban planning and management strategies to overcome the limits and failures in the management of environmental resources. The paper presents significant experiences of the urban sustainability assessment research of housing policies at the urban planning level in Ho Chi Minh City. The aim of this paper is to discuss the importance of socio-environmental efficiency indicators for Sustainability Assessment in spatial development planning. Although environmentally inefficient settlement development structures are resulting in an ongoing unsustainable use of land-resources, planning instruments have their limitations to promote the necessary structural changes in spatial development planning. Based on current urban growth research, this paper offers an overview of available indicators that can describe the efficiency of regional and urban spatial structures in relation to land use and land consumption. The relevance of these indicators in relation to contrasting urban development models is verified. This section closes with recommendations for the integration of spatial-enabled sustainability indicators to assess the efficiency of zoning of new developments for residential areas and traffic infrastructures in urban planning.

672. (Paper)

**Facility-Level Sustainability Reporting to Support Next-Generation Environmental Policy: The Experience of the Facility Reporting Project**

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Organization- (or corporate-) level sustainability reporting has become a basic CSR activity. However, organization-level reporting does not meet the needs of key "next-generation" environmental regulatory and policy approaches such as environmental leadership programs, which require a clean compliance record and enhanced transparency and performance disclosure as a quid pro quo for regulatory flexibility. For these purposes, facility-level sustainability reporting (beyond existing regulatory reporting/disclosure) is required.

To be effective, however, facility-level reporting must be credible, consistent and comparable. This requires a facility reporting standard, analogous to

the organization-level standard presented by the Global Reporting Initiative (GRI).

The Facility Reporting Project (FRP; www.facilityreporting.org), a multistakeholder initiative, was created to develop and pilot such a framework in the US context, to be as compatible as possible with the GRI. This paper presents insights from the FRP experience into the nature of facility-level reporting (including the necessity of stakeholder engagement) and explores the theoretical linkages between facility-level reporting and next-generation regulatory approaches. It then discusses the actual uptake of the FRP reporting framework by state and federal regulatory agencies in the US, illustrating the potential and difficulty of implementing these linkages in practice.

682. (Paper)

**EIA Review & Follow-Up: "Leadership Models" for EIA Effectiveness in Africa**

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Over April 12 & 13, the UN Economic Commission for Africa (UN ECA) and CLEAA (Capacity and Linkages for Environmental Assessment in Africa, a pan-African network of EIA institutes and associations) will hold a high-level experts meeting in Addis Ababa on the effectiveness of African EIA systems, with particular focus on EIA review and follow-up. (The areas of greatest weakness in African EIA systems.)

Participants will include representatives of environmental agencies from African EIA "leader" countries and "follower countries" committed to strengthening their EIA systems, in addition to donors and organizations involved in EIA capacity-building and strengthening on the continent.

The meeting will be a forum for assessing EIA review and follow-up (enforcement) mechanisms that have had greatest success in achieving satisfactory regulatory performance in African EIA systems. On this basis, participants will agree on approaches for implementing the recommendations of the recent UN ECA multi-country assessment of EIA systems, and to develop an agenda for donors & other organizations with an interest in EIA effectiveness on the continent.

This paper will present a synopsis of these "leader" EIA review and follow-up mechanisms, the agenda for action that emerges from the meeting, and its implementation prospects.

675. (Paper)

**EIA Review, Enforcement and Funding: Lessons Learned from a Strategic Review of Mali's EIA System**

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Over January-September 2006, a multinational team undertook a strategic review of Mali's EIA system and the funding of environmental management activities in Mali. The review was financed by USAID/Mali and conducted in collaboration with Mali's Ministry of Environment. This paper presents the assessment framework used, the findings, and prospects for their implementation.

The assessment was conducted not primarily from an EIA practitioner's perspective, but from a regulatory performance perspective, with particular focus on institutional mechanisms for, implementation of, and funding for EIA review and follow-up (i.e., enforcement). Concurrently, the team assessed options for more sustainable funding mechanisms for the EIA system and environmental management activities more generally.

The options identified and recommendations made in these areas have broader applicability. They are also important: in common with many African countries, the EIA system in Mali is effectively the country's *only* functioning environmental regulatory system, and Mali's system labors under institutional and financial constraints that are common in the region.

The assessment piloted a technical assistance model developed by CLEAA (a pan-African network of EIA institutes and associations) and is proposed for broader implementation.

610. (Poster)

**Study on Application of Environmental Impact in Railroad Work**

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This paper describes the plans of considering the environmental influences in the preliminary feasibility investigation of railroad work. Because the cost-benefit analysis method about the environmental costs by air pollution and traffic noise is mainly applied in preliminary feasibility investigation, not only the verification in the

calculation method of these environmental costs but also the consideration in the environmental costs of the topographical damage and the ecosystem extinction by railroad work is needed. The environment-friendly plans in choosing the locations of the railroad route and station are also suggested, and they include (1) consideration of environment protection area, residential zone, and region with scenic beauty, (2) application of the existing railroad route and station, and (3) railroad route parallel to another traffic facility.

393. (Poster)

**Lead Contamination From Target Shooting in Washington State (USA) and Belarus: Similar Problems and Possible Resolution**

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Lead is an extremely toxic metal and probable carcinogen, which once in the body causes severe health effects in both humans and animals. Contamination of the soil from lead remaining after recreational and military target shooting has been found to directly and indirectly impact the environment. This poster will demonstrate the similarities of two situations where lead pollution from shooting is a potential problem. In Washington State (USA), unauthorized recreational target shooting has created high lead concentrations in the soil greatly exceeding cleanup levels. Likewise, potentially high levels of lead have concentrated from decades of range shooting at former Soviet military bases located in Belarus.

Several potential problems affecting the environment, public safety and health have arisen in each situation. In both cases, the problem is aggravated by the absence of governmental restrictions meaning that neither situation is officially regulated.

Determining at which stage (source, cleanup or future use) this issue should be handled to reduce the impacts from lead is extremely important. By performing the most pertinent impact assessment, governments can focus on effective strategies of containment, reduction and eventual removal of the lead on site. Once assessments are made, development of better regulations may prevent future damage.

456. (Paper)

**Waste Facility Siting and Citizen Involvement in US**

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Waste has always been a problem for cities, in both developed and developing countries. One of the most difficult things is waste facility siting, as no one wants to have waste near them. One effective way to deal with the problem is by involving citizens in planning at the earliest stage. It is effective, because early involvement in the planning process can reduce the cost of planning and implementation. The United States, as a country considered advanced in waste management, has also been involving its citizens at the earliest stage since several years ago. The governmental system of federal, state, and county/city makes the US system of citizen involvement different from other countries. This paper discusses the US waste facility siting planning system, and how the citizen involvement is conducted at the earliest stage of the process. The goal is to describe the US system and planning process and draw several learning points that could be useful for facility siting and citizen involvement in other places. In this paper, the governmental system of the US is described to present basic knowledge of its planning system, then narrowed down to study case in Washington State as example of citizen involvement process in waste facility siting.

783. (Paper)

**A Tentative Soil Map as an Inventory Based on the Recognition of Characteristics and Pedon Units of Urban Soils**

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The objective of this study is to develop a new classification system for urban soils. Land creating history, use and management of parks and physical-chemical properties of soils were examined for urban parks in Japan. The results from soil analyses clarified that physical-chemical feature of the second layer was regulated by the stress of miscellaneous urban fill, depending on land creating history of each park, while that of the surface layer was regulated by the use and management of the parks. A diagnostic surface layer was extracted from forest, grassland, bare land, and wood chip sections. A two-dimension coordination system composed of grading method and park use was proposed to subdivide urban park soils into specific soil units. The proposed system supported the applicability of subdividing urban park soils into soil units regardless of soil types. A tentative soil map was produced based on the recognition of pedon units and urban soil quality.

483. (Paper)

**A Methodological Issue in Post-Project Assessment of Social Impact: Case Study of Involuntary Resettlement Caused by Dam Construction in Japan**

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The purpose of the presentation is to pose an issue related to methodological aspects of social impact analysis, especially the timing of post project assessment or evaluation in development practice. In the compensation measures for involuntary resettlement caused by the dam construction, the principle that the standard of living for resettlers should be improved or at least to be the same level of that before resettlement is broadly agreed upon. However, the result of evaluation of resettlers' livelihoods after resettlement will vary depending on the timing of post evaluation as there naturally are uncertainty and unpredicted events in the social environment for resettlers. By presenting findings from the case study conducted in Japan after 50 years of resettlement caused by dam construction, it is argued that, in the presence of uncertainty or unpredicted events, it is necessary to monitor and evaluate social impact in the longitudinal manner with the commitment. For practical and operational implication for development projects in developing countries, it is also noted that the commitment means will not only for monitoring but also for taking necessary measures to rectify and/or mitigate the difficulties faced by the resettlers even after the project completion.

9. (Paper)

**Impact of Urban Development Plan on Land Use in Strategic Environmental Assessment: A Case Study of Wuhan City, China**

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In urbanizing regions, urban sprawl and infrastructure cause profound alterations of land use. Initial decisions on urban expansion and infrastructure investments are often made on a strategic level where the long-term regional development is determined. For these decisions a strategic environmental assessment (SEA) can be prepared. However, the lack of adequate conceptual and methodological frameworks poses a major problem for the analysis of impacts, not least concerning land resource. This paper, based on a recent project, offers an insight into the experience of integration of SEA into governmental plan making in China, and Wuhan city in particular. This is materialized by means of appraising the degree of integration of SEA process with land-use ordering process of Wuhan Urban Development Plan (2006-2010). It highlights the need for effective methods for land resource analysis at landscape and regional levels, with reference to long-term urban development. Problems of habitat loss, fragmentation and other impacts related to large-scale urbanization and infrastructure development are addressed. Expert judgments and GIS-based methods focusing on identify ecological impact are discussed. The implementation of such methodologies in SEA process allows a better integration of the principles of land resource protection in decision-making.

602. (Paper)

**The “Awakening” of SIA in the Northwest Territories, Canada: The Mackenzie Valley Environmental Impact Review Board’s Experience.**

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Past environmental impact assessments (EIA) in Canada and many parts of the world have focused on the biophysical environment. Within Canada, most considerations of socio-economic impacts relate to a biophysical impact that may result from a development. In Canada’s north, the settlement of “comprehensive land claims” between Indigenous peoples and the Canadian government resulted in distinct environmental legislation. The Mackenzie Valley Resource Management Act has a unique definition of “impact on the environment” that in

addition to consideration of biophysical impacts, includes any effects on social, cultural, and heritage resources.

The challenge implementing this legislation has been the recognition of new roles and responsibilities related to socio-economic impact assessment and mitigation. This paper identifies how the body responsible for EIA, the Mackenzie Valley Environmental Impact Review Board (Review Board), has taken steps to bring socio-economic considerations into its processes. It examines how the Review Board engaged diverse groups (industry, government, experts in social matters and the people of the Northwest Territories) in a process that culminated with the release of Socio-Economic Impact Assessment Guidelines. The true test will be whether the resulting rigorous assessment will translate into better management of social, economic and cultural impacts.

739. (Poster)

**Impact Assessment as Part of Integrated Planning and Management of Tourism in and around Natural Areas**

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Tourism in New Zealand relies heavily on nature-based resources, with impacts on natural areas and host communities. This research programme is developing an integrated approach to planning and management of tourism around natural areas, which includes considering social, cultural, environmental and economic impacts. The research is contributing to the national strategic research objective of a “dynamic tourism industry which is environmentally, socially, culturally and economically sustainable.” Key issues include competing requirements of tourism and outdoor recreation activities, recognition of finite capacity for activities at some sites, and the need to assess impacts and monitor progress towards sustainability. An iterative, multi-method approach fed findings from interviews, literature reviews, case studies and workshops into an integrated model (to guide development of a web-based tool box). The research process identified a

critical need to integrate the use of tools across different dimensions of sustainable management. Impact assessment was defined as one of six key sets of tools that should integrate better. Individually, tools are narrowly focused and miss the benefits of integration to address complex issues of environmental management. The website is designed to facilitate access to the full range of tools and capacity building in support of their use.

243. (Paper)

**Impact Assessment in Rural Development Planning: A Case Study of Nansanga Farm Block Development in Serenje District of Zambia**

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Impact Assessment in Rural Development Planning is a relatively new concept in the Zambian perspective. Rural Development has in the past been largely based on physical, technical and economical feasibility of projects. The consequence has been the introduction of new social and environmental problems, many which still have to be addressed decades after the implementation of some projects. This paper highlights the importance of impact assessment in rural development planning in Zambia, with the development of Nasanga Farm Block in Serenje District of Central Province of Zambia as a case study.

226. (Paper)

**Reclamation and Closure of Coal Mines: Implications to Develop a National Strategy for Reclamation of Coal Mines in South Africa**

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It was found that most of the impacts of the mines on the environment and the surrounding areas were associated with the operational and closure phases of the mines. Major impacts and concerns that arose during the closure were the stability of the mined areas; contamination and pollution in the surrounding areas, especially the pollution of ground water aquifers; visual impacts, particularly of the discard dumps and slurry dams; shafts; and the monitoring of the environment following the mines' closure.

Continuous strengthening of EIA/SEA (2006 EIA review) requirements and compliance has yielded positive mine reclamation strides in South Africa. The intended outcome of this paper is to share EIA/SEA experiences, challenges and successes with other participants, especially since there is a major paradigm shift from project specific mine reclamation to regional closure with greater

emphasis on environmental cumulative impacts. The rationale for this paper is to highlight the importance of a comprehensive EIA/SEA as the only guarantee to a successful mine rehabilitation, closure and aftercare. Participation in the IAIA07 is imperative to mould and shape our mine reclamation strategy with international environmental management standards.

276. (Paper)

**Vulnerability and Adaptation of Wetland Based Ecosystems in Relation to Climate Variability and Extremes in Lake Victoria Basin**

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Rainfall is one of the main agricultural inputs in the Lake Victoria basin and its characteristics and variability affect the agricultural production. Reduced rainfall is linked to reduced moisture availability in the soils leading to poor growing condition and consequently low crop production. The lengthening of the dry day spells and increased frequency of high rainfalls may combine into frequent disastrous flooding during the rainy season and extended periods of severe low flows during the dry season. The overall consequence is the reduction of water availability to the society.

The study aimed at i) identifying the likelihood of the occurrence of hydrological extreme events in areas in Tanzania located southwest of Lake Victoria, and ii) assessing the nature of community responses to reduce the impacts of such extremes. Indices of floods and droughts were defined using rainfall anomalies and used to identify years when extreme events have occurred. Group discussions, household surveys and personal observations were used to understand the implications of past extreme events for community livelihoods and to suggest more appropriate adaptation measures to reduce the impacts of extreme events in the future.

119. (Paper)

**Impact Assessment and Environmental Sustainability in the Niger Delta Region of Nigeria: The Role of Government and Oil Companies Operating in the Region**

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The Niger Delta is the richest part of Nigeria in terms of natural resources. The area has large oil

and gas deposits, as well as extensive forests, good agricultural land and abundant fish resources. Despite the tremendous natural and human resource base, the region's potential for sustainable development remains unfulfilled and its future is being threatened by environmental degradation and deteriorating economic conditions which are not being addressed by present policies and actions. This paper addresses the role of impact assessment in redressing the environmental conditions of the region, and also assesses the roles of the stakeholders (government and oil companies) in implementing sound technologies for its environmental sustainability.

334. (Poster)

#### **Development of HIA in Republic of Slovenia**

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In 1993 Republic of Slovenia adopted its first Environmental Protection Act (EPA1) which implanted EIA. HIA was not mentioned. A first step to HIA was adoption of the Directive on the methodology how to elaborate EIA reports in 1996. The Directive declares that assessment of impacts on quality of life should be assessed. The second step to HIA was adoption of EPA2 in 2004. EPA2 postulated that in project oriented EIA an area with impacts with adverse impacts on human health has to be defined. In 2005 a Regulation on the assessment of the effects of certain plans and programmes on the environment was adopted. In this Regulation it is clearly postulated that impacts on human health must to be assessed. In practice, development of HIA is slow. In project EIAs, most reports do not include HIA, or a simple assessment is made that there is no effect on human health. HIA of impacts of plans and programmes is at the similar level as HIA of proposed projects. HIAs conducted involved only a few people spending a few hours with no or very limited recourse to literature searches or professional epidemiologists or sociologists. They focus mainly on health as absence of disease.

310/311. (Paper/Poster)

#### **Possibilities of Strengthening of EIA Process by EMS and Vice Versa**

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In Republic of Slovenia since 1997, more than 420 ISO 14001 certificates were issued. There are only about 70 companies with ISO 14001 certificates which undergo IPPC Directive (less than 40 % of such companies identified). Companies undergoing IPPC Directive are obliged to perform EIA for proposed projects. EMS can make EIA process more effective by adding strength to it.

Strength of EIA process can be defined as a measure describing to what degree a certain EIA process ensures that all the objectives of EIA process are met. Strength of EIA process consists of two types of strength: process and issues and impacts strength. Fully implemented EMS can contribute to increase the strength of both types.

EMS ensures that environment becomes an important component of decision making process in early stages of the project cycle. By this it increases EIA process strength. Issues and impacts strength of EIA is increased by data an EIA elaborator can gather from environmental aspects and applicable legal and other requirements. Data on evaluation of compliance can also be very useful.

On the other hand, EIA methods can be very useful when the organization has to identify environmental aspects of its activities and products while planning new developments.

227. (Paper)

#### **Integrating Biodiversity Conservation in Impact Assessment in Uganda**

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Uganda has a total area of 241,551km<sup>2</sup> out of which farmland is the most extensive, followed by grasslands, woodlands, water bodies, bush lands, tropical high forests, in that order. Uganda is very rich in species diversity, with more than 18,783 species that are known or have been recorded in Uganda. Its biological diversity is one of the highest on the African Continent.

There have been significant efforts in improving the policy and legal framework for sound environmental management.

These policies and laws address issues such as biodiversity conservation, community participation in natural resources management and benefit sharing, and the roles of civil society and the private sector in the management of these natural resources.

Government has also put in place the National Environment (Environmental Impact Assessment)

Regulations (1998) and Guidelines for EIA to guide the process.

This paper focuses on the incorporation of biodiversity into the environmental impact assessment process of Uganda and the challenges being faced, particularly with regards to wetland and forest biodiversity.

657. (Poster)

#### **Capacity Development through Knowledge Sharing**

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What is the most effective way of learning? Doing it yourself! And who can be your guide therein? Someone else who knows it from experience. In practice it is best to see this person in his/her own circumstances to better understand why something works and other things don't and under which conditions. But often this is no realistic option. Therefore the Netherlands Commission for Environmental Assessment maintains a knowledge platform and an SEA database to collect and present case studies, good practice EIA and SEA, and materials from capacity development programmes and on-the-job training.

The knowledge platform also provides a helpdesk.

A lot of information is based on the NCEA's own experiences internationally. In 2007 more information on EIA and SEA in the Netherlands will become available in English. In the database, links are made to experiences from other countries and institutions. An impression of what we like to share, and hope you would like to share with us will be presented on the poster.

386. (Paper)

#### **Equator Principles**

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Will the Equator Principles be mature? A substantial amount of private financial institutions adopted in 2003 the so-called Equator Principles: performance standards on social and environmental sustainability and disclosure policy: the IFC/World Bank standards. The announcement by a group of private banks was received as a promising development concerning the environmental/social impacts of major investments. "The Equator Principles are a shining beacon for responsible banking. Their impact on the financial market generally and their success in redefining banking considerations has been far greater than anyone could have predicted,"

is what one commentator wrote. The 2006 revised principles even have a broader application than the first adopted principles. However, since then the EPFIs (Equator Principles Financial Institutions) are confronted with two divergent demands. The international NGO community and independent researchers ask for a compliance review mechanism and mediation function similar to the accountability mechanisms that most Multilateral Financial Institutions have established. So far the EPFIs have ignored the demand. Simultaneously officials of EPFIs warn that the competition of Chinese banks that "do not bother about social or human rights conditions," could lead to downgrade the standards. So how can the world community guarantee the challenging principles?

394. (Paper)

#### **SIA as a Social Quality Assurance Process**

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SIA has been a technocratic expert-driven process which sought to identify the social impacts arising from the implementation of projects or policy. Although intended to be in the community interest, SIA has not always engaged the community. Some have critiqued SIA, seeing it as little more than legitimating (bad) development. In contrast, the "International Principles for SIA" advocate that SIA take a proactive stance for social development rather than be limited to the identification and mitigation of negative outcomes. This new model considers that assisting communities to identify development goals and maximizing positive outcomes is more important than minimizing harm from negative impacts. SIA should be part of the adaptive management. SIA also needs to assist communities to cope with change. Such a multifaceted understanding is not consistent with current regulatory processes associated with SIA/EIA. This paper speculates on the potential of a Quality Assurance process similar to an Environmental Management System to address social issues in the operations of corporations and other organizations. The argument is that SIA would be more effective in achieving its goals if it were seen as a quality assurance process rather than being a point-in-time assessment of potential impacts.

786. (Poster)

**The State of AEE Guidance Material Provided to Resource Consent Applicants by Local, Regional and Central Government in New Zealand**

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One major problem of EIA is ensuring that people know how to use it properly. The key to solving this problem is to explain the nature and purpose of EIA and how it can be used to best effect. The main aim of this research is to assess the quality of guidance on impact assessment provided to users by local, regional and central government in New Zealand, under the Resource Management Act. A second aim is to formulate a best practice model for such guidance, for use by intending applicants to give them the best help and certainty in their resource consent application.

All councils in New Zealand have been approached for copies, paper or electronic, of their impact assessment guidance. This is being evaluated using criteria based on good practice impact assessment. In addition, experiences in other countries, but also in other professional sectors, will be examined, to provide a broader framework for evaluating AEE guidance in New Zealand.

343. (Poster)

**Pollution: Think Before Problems Show Up**

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My poster consists in 4 photos taken from my country, Albania. These photos show the pollution of my country in air, land and water. The first photo shows the smoking of the Metallurgic Indutri of Elbasan and the smoke emitted from this industry. This industry is a big problem for the city and its inhabitants. The second photo is River of Lana, the main river of Capital City, Tirana. In this photo is shown the pollution of the water caused by solid wastes. The third photo shows the Field of Sharra where the solid wastes are accumulated. This is the biggest environmental problem for our capital city. The fourth photo shows the smog caused by grave traffic of Tirana. Through my poster I want to give a message to all governments and people as well to protect environment before it's too late.

462. (Paper)

**Promoting Good Governance and Corporate Stewardship Responsibly through Successful Project Management of Social Impact Assessments**

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A well-managed project can have increased benefits for all involved, but the strongest value is integrity. Successful project management allows the SIA to make its assessment through its processes, and control of input.

Good governance and responsible corporate stewardship are both necessary for ensuring accurate outcomes from conducting social and economic impact assessments. However, the sufficient condition underlying success involves high quality project management skills. Successful management of a project is considered as a process which allows for the project to guide but not influence the opinions of the participants.

The premise of the paper is that successful project management makes a tangible difference to the outcome of an impact assessment study. We put forward our case study: an impact assessment of the expansion of the bauxite and alumina mine on the Yolngu people of Arnhem Land, Northern Australia.

The paper discusses the methodology developed to take account of the reality of the people. Working with Indigenous and non-Indigenous people of the area, the second part of the paper will provide evidences of controlled project management which allowed for the social impact assessment to be only determined by the community (stakeholders). Finally the paper will draw conclusions for IA practitioners. As the environment in which IA practitioners becomes more complex, the involvement of project management skills are becoming more important.

333. (Paper)

**Early Findings from the Appropriate Assessment of Plans as Required by the Habitats Directive 92/43/EEC**

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Directive 92/43/EEC – the 'Habitats Directive' - provides legal protection for habitats and species of European importance. It establishes an EU-wide network of sites known as Natura 2000 and sets out the decision-making tests required for plans or

projects that may affect Natura 2000 sites. These tests are collectively known as Appropriate Assessment (AA). AA is required for plans which, alone or in combination with other plans or projects, would be likely to have a significant effect on a Natura 2000 site(s).

Appropriate assessment has been carried out on projects across Europe since the adoption of the Directive, but until last year there were no examples of application to development plans. Following a recent ruling by the ECJ to amend its regulations, the UK has seen the first AAs being undertaken for plans in the UK. This paper looks at a number of case studies of AA undertaken at the local and regional level in the UK over the last year and examines the benefits and issues of different AA approaches currently in use, what changes to the plan have resulted from the AA, and what the links are with SEA and SA?

235. (Paper)

**Impact Assessment in the Face of Land Use regulation: Dealing with Conflict through the Use of Stakeholders Dialogue**

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Conflicts around the impacts of an infrastructure project are difficult to eliminate. Impact assessment approval is particularly difficult in the face of land use regulation. By introducing a multi-stakeholder dialogue project, promoters may engage in negotiation and conflict management strategies that may reduce the conflict potential of the project. Dialogue may produce problem solutions by consensus and generate opportunities for public participation. The first part of this paper describes the challenges for IA approval in the face of land use regulation in Mexico. The second part describes the components and stages of stakeholder dialogue based on the experience of cases in Mexico and how such schemes may contribute to generate information for different social groups. In the third part we present a list of recommendations for project promoters wishing to implement a multi stakeholder dialogue as a strategy for conflict prevention and conflict management in the face of tough land use regulation.

706. (Paper)

**'Bling' and the Art of Impact Assessment**

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The various branches of the impact assessment tree have progressed rapidly in the last decades. They have become more scientifically sound, technically advanced and socially skilled. However, one issue has not advanced a lot: image and – linked to that – influence.

IA started as a technical tool of specialists, not attracting a lot of attention of the 'people that matter' – i.e., those in power, elected, making a difference (top-level civil servants, captains of industry, ministers). To them, IA is something their employees do to fulfill obligations. However, we have learned that the people in charge need to be committed to the IA process, from the early start. To make a difference and overcome resistance, agenda setting, issue filtration, using windows of opportunity and timely communication are needed. Key question then is: how to achieve this?

The authors argue that IA specialists need to combine forces with those arts and skills that have been underrepresented in IA, such as writers, artists, PR and marketing specialists. Key objective is to put sufficient 'bling' into IA to attract (new) audiences. Options range from Bono to videos, from storytelling to pin ups and from blogs to virtual communities.

131. (Paper)

**Modeling Phytoremediation of Heavy Metal Contaminated Mine Spoil Dumps**

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An important component in environmental impact assessment is to design an effective environmental management plan for the developmental activity. With easy availability of fast computational tools, mathematical models are not only being used for prediction of impacts but also for designing remediation strategies and activities as a part of effective environmental management plan. After the economical extraction of target metal from the ore bodies, the remaining mine spoil having a high heavy metal content is dumped, which can leach to the groundwater issues and can also pollute the nearby surface water sources. For such mine-spoil dumps, Phyto-remediation is an emerging technique for the *in-situ* treatment of contaminated soil/mine spoil at low cost. Based on laboratory/field scale studies, mathematical expressions have been developed for different phenomena like metal adsorption in soil, plant root growth with time, moisture and metal uptake by plant root. The complete design of any such Phytoremediation program would require knowledge of behavior of heavy metal movement in soil, water and plant root system. In this paper a model for simulating heavy metal dynamics in soil, water and plant root system is developed and analyzed and the formulation has been illustrated using characteristic example.

748. (Paper)

**Sustainable Development in Environmental Impact Assessment of Road Projects: State of Practice and Future Trends in Africa**

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Fighting poverty efficiently in Africa is at least partially dependant on sustainable transportation systems. Road projects are very common in Africa. Positive economic and social impacts are targeted but they can also have important negative environmental impacts. In most African countries, those projects are subjected by law to environmental impact assessment. This analysis presents a portrait of the practice of environmental impact assessment (EIA) studies conducted in different African contexts (different climatic conditions; nature of the project: new roads, maintenance or rehabilitation; local or international experts involved) in the past ten years, through five case studies. It questions their efficiency and contribution to sustainability. Four categories of criteria are used: procedures involved (regulatory frameworks), assessment process (clear objectives, duration and cost; level of public participation; integration of sustainability objectives; monitoring and follow-up; risk management), methodology (influence of guidelines; sector approaches; participatory methodologies) and contents (report content as reference state of the environment, context and justification of the project, project components and study areas; nature of the assessed impacts as biophysical, health, social, heritage, landscape, quality of life). The synthesis is presented as a SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) and recommendations are suggested to improve EIA practice.

379. (Paper)

**Effect of Lime (Quick Lime CaO) Stabilisation on Intestinal Pathogens in Domestic Septage: A Pre-Disposal Treatment**

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The effect of lime stabilization on intestinal pathogens from septage samples were investigated. Two septage samples, treated and untreated, were analyzed microbiologically for total heterotrophic count (THC) or viable counts and most probable number (MPN) for coliform estimations. Lime [Ca(OH)<sub>2</sub>] was added to the treated septage until a pH of 12.0 was attained and left at that pH for 30 minutes, while nothing was added to the untreated septage which served as control. This experiment is pH and time dependent. Result of the THC obtained from treated septage showed no growth of intestinal pathogens, except few growth of *Bacillus subtilis* (104 cfu/g). The untreated septage showed heavy growth of *Salmonella typhi* (104 cfu/g), *Proteus vulgaris* (104 cfu/g), *Escherichia coli* (105 cfu/g) and *Bacillus subtilis* (104 cfu/g). The MPN result for coliform estimation also showed a drastic reduction

in faecal coliform from 1600/100ml for untreated to 14/100ml for treated septage. The results of this study showed that with the application of lime or any other alkali in domestic septage, the level of intestinal pathogens will be reduced, if not completely eliminated.

371. (Paper)

**Environmental Impact Assessment for the Construction of Foreshore Protection in the Niger Delta, Nigeria**

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Human health has always been dependent on our relationship with our environment. Every sane human being desires to be healthy, but good health can be elusive especially when we fail to mind our actions on the environment. This is because a poor, filthy, and putrid environment can affect the health of an individual and result in subsequent death. The health implication of communities with some of these environmental problems could be quite serious. Communities are constantly ravaged by cholera outbreaks, malaria and other related diseases. This study focuses on the need for both government at all levels and individuals to conduct EIA studies on how to protect the Riverine Areas of the Niger Delta. It also highlights the natural disaster that may occur if the sea shores are not protected, such as gully erosion land degradation. Construction offshores around communities close to the ocean will help protect them from these natural disasters.

374. (Paper)

**Assessment of Health Risk Exposure of Solid Waste Disposal Workers in Port Harcourt, Nigeria**

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In this study, the various health risks associated with waste disposal workers in Port Harcourt were investigated. The aim is to assess the extent of exposure in terms of inhalation of toxic substances into their systems and its effects on their health since the workers are not protected in any way while doing their jobs. About 10ml of venous blood were collected from 50 waste disposal workers, aged between 21 – 50 and 15 control subjects of the

same age bracket. A Haematological parameters, Liver function Test (LFT) and microbiological parameters were carried out using Qualitative Buffy Coat (QBC) and atomic absorption spectrophotometer (AAS) machine. The result shows that there was a progressive decrease in platelet and total white blood cell (WBC) counts, depending on the years of exposure. This study shows the progressive risks of liver, malaria infections and high level of toxicants the solid waste disposal workers are exposed to. Adequate Personal Protective Equipment (PPE) should be provided to avoid epidemic among the workers. It is also presumed that these waste disposal workers could also be carriers of some pathogens in the waste they dispose.

429. (Paper)

**From Policies to Practice- Environmental Support to Peacekeeping Operations**

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An area of growing concern for the Swedish Armed Forces is environmental considerations in peace keeping and peace enforcing operations as Sweden, like many other countries, increases its involvement in such missions. A need for close cooperation between military and civilian actors has been identified as well as the importance of different types of networks.

In a recent cooperation between Sweden (the Swedish Armed Forces) and the Swedish Defence Research Agency and United Nations Department of Peacekeeping Operations (UN DPKO), Environmental Protection issues have been addressed.

One project deliverable was to start the implementation of the recently developed UN DPKO Environmental Policy and Guideline by providing training to environmental engineers in UN field missions. The first trial education took place in Italy in 2006 where the participants among other things shared lessons learned from their current and previous mission experiences. The major environmental problems affecting peacekeeping operations, which are typically deployed in a post conflict and/or developing country, were discussed and a list of suggested actions were developed. Training for key staff and raising general awareness among mission staff was considered paramount and



an annual workshop suggested. The presentation will describe the outcome and suggested way ahead.

234. (Paper)

**Repositioning the Horse Before the Cart: A Relook at EIA**

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Ten years ago, IAIA produced a study on the effectiveness of environmental assessment (Sadler, 1996). Shortly thereafter, in 1997, South Africa gazetted regulations enforcing EIA. In spite of major improvements in impact assessment and worldwide uptake of tools like EIA, the recurrent limitations to EIA effectiveness over the past decade suggest that we have made limited progress in honing our approach to impact assessment to one which allows it to reach its full potential and serve its desired purpose. It might be time for a radical rethink of our approach.

In this paper we identify the key, recurrent obstacles to EIA effectiveness (based largely on South African experience supplemented by published international experience); thereafter we explore approaches to dealing with these issues based on thinking from the emerging field of "sustainability science." In particular, we focus on dealing with multiple epistemologies and integrating different knowledge forms in EIA; a systemic approach to defining scale and boundaries; dealing with complex, unpredictable problems; and moving away from a developer and procedure-driven process to one which is based on social-ecological system resilience.

318. (Paper)

**Russian-German Manual on Environmental Impact Assessment**

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The point of departure for the present Russian-German research project is the agreement arrived at between the Federal Republic of Germany and the Russian Federation in 1992 on co-operation in the area of environmental conservation.

The goal of these activities under the Russian-German agreement is to support the Russian governmental and non-governmental institutions in their efforts to modernise and harmonise their instruments and methods in the environmental and conservation areas. The present research project therefore envisages the development of a Russian-German manual on EIA in the Russian Federation and Germany. The EE and the OVOS are crucial instruments for good sustainable development. Although Russia has the necessary legal foundations, considerable uncertainties still exist regarding the implementation of the legal stipulations. A Russian-German manual on the EE and the OVOS could help remedy these deficits through a broad standardisation and formulation of minimum requirements. Already existing Russian standards are to be brought together and harmonised, and German and European stipulations are to be introduced as possibilities for practice optimisation in Russia. The presentation provides intermediate results of the research project.

708. (Paper)

**Ensuring Quality Impact Assessments through Corporate Governance**

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In these circumstances, the promotion of good governance and corporate stewardship through the impact assessment process poses a real challenge. It does not lie directly within the franchisor's locus of control.

This paper presents an overview of lessons learned and actions taken by Sasol Oil, to address these challenges from the perspective of an oil company, operating as a franchisor in the South African petroleum retail industry.

Maintaining the societal licence to operate and the protection of brand and reputation have become key business drivers. This has resulted in numerous business related governance initiatives being implemented, to ensure that all business related activities are aligned with the corporate Safety, Health and Environmental ("SH&E") and Sustainable Development ("SD") principles adopted and subscribed to by a business. The adoption of company specific SH&E and SD Minimum Requirements and standards, often extending requirements beyond country specific legislative requirements, necessitates corporate governance to be exercised to ensure that, for example, the standard of environmental impact assessments

carried out, meet the desired company specific standards and outcomes.

However, there are scenarios in which corporate entities (franchisors) carry out business by entering into agreements with individuals (developers and franchisees) in order to develop and operate a development, such as a retail filling station, intended to carry the brand of the corporate entity.

Often the attraction to such a deal is the fact that the necessary environmental authorisations and rezoning authorisations have already been obtained or is the sole responsibility of the proposed developer. Generally the developer carries the risks involved with the development.

237. (Paper)

**Balancing Between Geothermal Energy Capacity Expansion and Wildlife Conservation in Kenya's National Parks/Game Reserves with Geothermal Energy Potential**

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Three major energy sources are utilized in Kenya. They are comprised of biomass, petroleum and electricity. Hydropower dominates the electricity sub-sector, followed by fossil and geothermal. Owing to unreliable rain patterns and Kenya's high dependence on hydropower, the electricity supply has been becoming unreliable in dry seasons. Development of geothermal energy is thus environmentally benign and reliable. The energy demand has increased with improvement of economy. The government has demonstrated a great commitment to exploitation of geothermal energy.

Geothermal systems are associated with Great Africa Rift Valley, which intersects Kenya and other countries. The current output in Kenya is 130 MW, all located in Hell's Gate National Park. There are plans to increase the generation by an additional 576 MW by 2026. Thirteen other geothermal energy prospect areas exist in the Kenyan Rift of which Olkaria, Longonot, Lake Bogoria, Lake Baringo are all wildlife conservation areas.

Kenya has over the years gained experience in managing the environmental issues associated with geothermal energy development in wildlife conservation area. This has proved that geothermal energy development can coexist with wildlife conservation with maximum benefit for diverse resource for sustainable economic growth with the planned power capacity expansion.

561. (Paper)

**ESIA - No longer a Tick in the Box for Oil and Gas**

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The Environmental, Social and Health Risk and Impact Management Process (e-SHRIMP) is a tool developed by a taskforce within the International Association of Oil & Gas Producers (OGP). It is aimed at delivering additional value in Oil and Gas projects through enhanced quality, consistency and industry alignment. It builds on good practice and shared learning of a number of OGP member companies. This will enable member companies other oil and gas companies to benefit. Key features include:

- Early identification of project risks or opportunities;
- Linking ESIA with project decision-making;
- A consistent process to aid delivery on time and on budget;
- A framework for contract awards;
- Enhancing corporate memory by the application of experience and learning
- Establishing shareholder confidence.

A common set of tools can be shared that can be custom fit to the user's specific project. The approach will establish a valuable platform in joint ventures and to define the requirements for contractors (including consultants). It should also assist groups in the external community, including financial institutions, investors and other stakeholders (NGOs and other interest groups) in their engagement with projects.

The process in developing this tool has been presented at previous IAIA conferences.

524. (Paper)

**Meeting the Energy Needs of Underserved Consumers - A Novel Approach**

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In 2004 BP sent a research team to India in order to study organic business growth opportunities. The

team identified a huge untapped energy market in rural India that does not have access to clean, safe and affordable energy. In cooperation with local institutions a modular cooking solution consisting of agricultural waste based pellets, a near smokeless biomass stove, bottled LPG and an LPG stove has been developed. By serving the multiple energy needs of these rural consumers a sustainable, profitable and scalable business has been created.

A series of impact assessment studies were commissioned including a Life Cycle Assessment of the agricultural waste pellets, thought to be one of the most comprehensive of its kind. Social assessments were also undertaken due to innovative market entry that includes the empowerment of women by converting them into village entrepreneurs. The business model has already been launched in more than 60 villages in the states of Maharashtra and Tamil Nadu, reaching more than 10000 consumers by the end of 2006. This is possibly the first time that a large company like BP has implemented such a comprehensive business plan in this area.

Research continues to identify other rural consumer energy needs.

484. (Paper)

**Mediated Representativity: The VPA AIDS & Rural Development**

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As a result of the AIDS epidemic, the social fabric in the rural areas of many developing countries is falling apart. The disease generates new demands on infrastructure, technology and the communication information system. These impacts go beyond health issues but have to do with intergenerational knowledge transfer, investment capacity and diminishing coping capacity. For that reason HIV/AIDS impacts should be the focus of attention of rural development organizations. Filmed interviews, as part of a Visual Problem Appraisal (VPA) training package can be used for problem framing, agenda setting and policy analysis. In a VPA, users meet distanced or otherwise overlooked stakeholders in a mediated way. It brings their concerns and issues to the decision makers. The VPA AIDS & Rural Development facilitates the conscious consideration of their stories, concerns and proposals and generates social learning. This

form of "mediated representativity" creates new spaces of governance as it allows indirect stakeholders and policy makers to 'learn' in semi-interaction with direct stakeholders. This paper shares our experiences with making and using the VPA AIDS & Rural Development in workshops in Africa and Asia.

350. (Paper)

**Comparing Institutions: The Tennessee Valley Authority and the Niger Delta Development Commission**

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The volatile development situation of the Niger Delta and its strategic importance to Nigeria and the rest of the world underscore the necessity and urgency of applying best development practice to that critical region.

In response to this situation, the Social Impact Assessment Center (SIAC), together with members of IAIA-Nigeria, have been conducting a project on "Comparing Regions: Applying Lessons Learned to Niger Delta Development" over the past five years.

The first event in this process, an international conference on "Comparing Rivers: The Mississippi and the Niger," was held November 2002 in New Orleans. A sequel event, a traveling seminar on "Comparing Wetlands: The Florida Everglades and the Niger Delta," was held April 2006 in South Florida.

This paper reports on the third event in the series, a traveling seminar on "Comparing Institutions: The Tennessee Valley Authority and the Niger Delta Development Commission."

Its relevance to impact assessment and the theme of this meeting pertains to the need for proactive and creative approaches to integrating environment and development concerns. In the present context, this implies the application of impact assessment to comprehensive regional development planning and management, including institutional assessment and capacity development and conflict assessment and management.

780. (Paper)

**Highway Privatization Impacts: We Can't Get No Satisfaction...**

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Since 1998 Brazil has implemented a major program of highway privatization, with specific purpose private companies operating 12 major highways within the State of São Paulo. Investments of over US\$2.2 billion have been made to date, and road quality, traffic flows and safety indicators have improved. User satisfaction with road conditions is very high, but the high costs of toll charges give cause for complaints.

In this study we evaluate the socio-economic impact of the project, contrasting out of pocket expenses with direct benefits to both private car user, and freight operators to the benefits derived from improved highway conditions. Also several indirect costs and benefits or externalities are estimated, regarding accident rates, taxes levied, environmental effects, etc.

Economic effects on towns served by these highways are compared to a control group of towns not reached by privatized roads, showing greater economic growth, municipal tax income, job creation and personal income levels.

Suggestions are made as to improving information and distribution of the positive impacts and mitigating the negative effects of the road operation privatization through improved contract requirements in future concession agreements.

463. (Paper)

**Public Participation in Taiwan EIA**

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Since the Environmental Impact Assessment act was established in 1994 in Taiwan, more and more people and environmental protection groups have asked for involvement in decision-making of developing project. To respond to those requirements, Taiwan EPA (Environmental Protection Administration) had set up several ways that allow individuals or groups to be aware of the nearby project; thereby they can submit their

opinions to EPA or even attend the EIA examining meetings. With few members of EIA committee coming from environmental protection groups, the conflicts between public awareness of sustainability and economic advancement were violently debated throughout the EIA reviewing process. Nowadays the public is able to express their opinions with many ways, oral or writing, at meetings or on websites. How to integrate multi-phases of opinions from residents and stakeholders, and to solve the local fear and environmental impacts, is huge challenge to Taiwan government. This paper will look over the role of government and developers in public participation, and how the government induces public demands into the EIA mechanism.

784. (Paper)

**Rural Landscape Information System (RuLIS)**

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Biodiversity is a focus of public attention concerning the global environment. The new National Biodiversity Strategy of Japan (Ministry of the Environment, 2002) categorized the crises facing biodiversity in Japan into three types: increase of human activities, decrease of human activities, and new problems such as alien species and chemical use. Each crisis is very closely associated with agriculture, because many wildlife species in Japan depend on semi-natural ecosystems developed and maintained by agriculture and rural human life. To conserve biodiversity in Japan, we need comprehensive approaches to understand relationships between biodiversity and agriculture or rural human life. For this purpose, we developed the Rural Landscape Information System (RuLIS) at NIAES to survey and analyze biodiversity in rural areas comprehensively. RuLIS is a practical application of utilization of natural resources inventory, which provides various kinds of attributions of the ecosystem. RuLIS can identify the management situation of land and its state and background of the biota in the agro-ecosystem. Prediction of the biota accompanying environmental change is also attained. The outline and its example with RuLIS will be introduced.

257. (Paper)

**The Future of Korean Dam Construction and SEA**

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The Korean peninsula faces the typical characteristics of East Asian monsoon in that seventy percent of annual precipitation falls in summer. As a result, there has been great demand for dam construction to control floods and to store water for the dry season. Fifteen multi-purpose dams have been constructed since the 1970s, supplying 10.8 billion tons of water per year.

However, the public's concern that dam construction brings inevitable negative impact has been growing, with construction of a few multi-purpose dams cancelled or suspended for years by opposition groups including NGOs and residents in the vicinity of dam sites, despite the need for greater water storage capacity.

In December 2004, the Ministry of Construction and Transportation (MOCT) enacted an internal SEA directive to reform this situation, and SEA for long term planning of national dam construction began in December 2005, with the aim of achieving ESSD and socially friendly elements in dam construction plans.

This study deals with issues including the SEA methodology implemented in long term dam construction planning and the systematic approach of alternatives comparison, mitigation measures and participation of stake holders, and concludes with the future direction to improve the SEA of dam planning.

673. (Paper)

**Marine and Social Impacts by Large-Scale Reclamation of Coastal Wetlands in Korea**

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As of the year 2004, 787 km<sup>2</sup> of coastal wetlands were reclaimed to secure agricultural and industrial lands during last four decades. Despite social opposition to the reclamation, the largest scale

reclamation project on wetlands called Saemangeum (401 km<sup>2</sup>) is being performed by governmental entities.

Impacts on marine environment in the process of reclamation have not been fully tackled because of the technical difficulty in assessing the impacts as well as social negligence about marine impacts. One of the impacts is coastal erosion or accumulation in undesirable areas, such as sand beaches or small piers in vicinities, mainly caused by the longest embankment in the world (with length of 33 km).

Degradation of marine water quality by pollutants from the inside of the embankment became one of the issues to be addressed. Marine sand extraction to fill up the inside area of the embankment will lead to the loss of beaches, fisheries, and habitats.

Even though recommendations were made to mitigate adverse impacts from the project in the EIA process, estimated impacts did not seem to decrease. The current EIA system in Korea has not enough authorities to cancel or downsize the projects considering marine environments.

636. (Paper)

**The Environmental Evaluation Method of Coastal Land Reclamation: Case Study of Korea**

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The importance of the maritime sector in Korea is increasingly recognized in recent days. As the country enters the new ocean era, strategic planning and decision making is an essential part of coastal area management, and evaluating environmental impacts of a public project becomes an major part of environmental management. This paper attempts to address Korea's coastal land reclamation policies and the strategic socio-environmental evaluation method. The criteria used for the evaluation of coastal land reclamation relate specifically to Korea's environmental needs and state, and those criteria are weighted according to their relative importance as perceived by the marine specialists.

In this article, a wide range of evaluation criteria from marine research professionals and evaluation is viewpointed. To structure and quantify the criteria

on the coastal land reclamation, authors elicited major objectives, then structured them into a hierarchy. The method and evaluation procedures can be understood and applied by practitioners and decision makers of marine policy since it follows naturally the standard practice of evaluating and relative comparisons of performance using evaluation process.

611. (Paper)

**Establishing a Conservation Area by Habitat and Landscape Matrix Analysis**

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Biodiversity is an essential factor in achieving sustainable development, and for this purpose conservation planning is being studied now. While a Focal Species Planning and Conservation Value Assessment of Landscape Matrix are the representatives of them, they are supporting each other in promoting the biodiversity. Thus, this study is going to propose an effective conservation planning by combining this two methodology.

In this study, first we found habitat suitability area among the forest edge of Seong Nam which has established species data by using target species and 7 environmental factors. The selected habitat suitability area was evaluated in the aspect of "Representation" and "Completeness," and verified whether it can be beneficial to other species within same biological guild, and then the result was applied to a great extent of ecoregion. Second, to protect the forest's interior species and identify forest patches that can function as an ecological network, we performed landscape matrix analysis and connectivity evaluation within the ecoregion. Finally, we suggested ideal conservation planning by combining aforementioned two conservation areas. Compared to previous conservation methodologies such as DGN (Degree of Green Naturality) and Ecological Naturalness, proposed conservation areas indicate distinctive features.

612. (Paper)

**The Effect of Current and Temperature of a Reservoir by the Simulation of Dam Outflow**

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Water quality in the Daecheong reservoir has deteriorated by algal bloom due to nutrient supply from the upstream of the Daecheong reservoir after heavy rainfall. Algal bloom is propagated from eutrophicated tributary into the main body of the reservoir according to the hydrological conditions. This study is aimed to estimate the water current and temperature effect by the simulation of dam spill flow control using water quality model, CE-QUAL-W2 in 2003. Water current resulted in nutrient transport from upstream of main reservoir and nutrients were delivered to downstream by fast water velocity. Algal blooms occurred in stagnate zone of reservoir downstream as the current of downstream was retarded according to dam outflow control. Consequently, water balance in stagnate zone triggered a rise of water temperature in summer. It affected algal bloom in the embayment of the reservoir. The simulation result by outflow control scenarios showed that spill flow augmentation induced in water body instability of stagnate zone so that water temperature declined. It could be suggested that outflow control minimize algal bloom in the downstream in the flooding season as long as water elevation level is maintained properly.

615. (Poster)

**The Solutions for Aesthetic Water Quality Improvement of Drinking Water in Korea**

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The investigation considers a water quality improvement plan that will include water treatment process, distribution and supply system. Based on the results from the investigation of water quality, we present the following the solutions to reduce the aesthetic unpleasant taste and odor to tap water.

The range of Langelier Index was -1~ -3 indicating the medium and strong corrosiveness. Furthermore, LSI decreased due to alkalinity decrease after the coagulation process. The minus value was increased during summer showing the strong corrosiveness. We propose an amendment of  $\text{Ca}(\text{OH})_2$  (liquid) and corrosiveness inhibitor that should be applied to increase alkalinity and input of corrosiveness inhibitor by using alkaline agent to reduce corrosiveness of tap water in water treatment processes. In order to reduce unpleasant odor of tap water caused by residual chlorine, we propose rectifying the present residual chlorine level of 0.2 mg/L to a new standard of 0.1 mg/L in tap water. We also propose application of "on-site chlorine generator" to decrease corrosion of pipe and supply re-input chlorine in water reservoir to produce a low of situ-chlorine product.

627. (Paper)

#### **Current Status of Public Participation in the EIA Process in China**

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The paper will address the following points:

- 1) The legal framework regarding public participation in China
- 2) The specific requirements on public participation in the process of EIA
- 3) Current practices
- 4) Problems, including those that the other Asian countries are facing or will face, and possible solutions

448. (Paper)

#### **SEA Trends in Asia - A Summary of Experiences from Six Asian Countries (China, Iran, Mongolia, Philippines, Sri Lanka and Vietnam)**

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The purpose of the paper is to discuss examples of success stories and challenges related to experiences from introducing changes and improvements of the EIA/SEA systems in different countries in Asia. The presenters will be 5 - 10 EIA/SEA professionals from 3 - 6 Asian countries who have all participated in a 5-week Advanced International Training Programme in Sweden during 1998 - 2006. The Training Programmes were arranged by Ramboll Natura and financed by the Swedish International Development Cooperation Agency (Sida). A majority of the presenters are decision-makers and specialists in environmental authorities and environmental organizations, and/or planners and managers in environmental divisions within central or local authorities, and sector ministries or organizations. As part of the Training Programme each participant developed a "change project," aiming at improving the EIA/SEA system within their respective countries and/or organizations. Prior to the Conference they will meet in a Follow-up Workshop in Vietnam. One of the objectives of the Follow-up Workshop is to exchange experience between the participants from

Asia related to the participants' "change projects" and institutional change processes in general. The Workshop will also deal with, e.g., creative ways to network to facilitate improvements.

575. (Paper)

**Keystones and Outlines on Appraisal of EIA on Petroleum-Refinery and Ethylene Industrial Proposed Projects**

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The paper describes the situation and problems of petroleum-refinery and ethylene industry in China today. Combining with the experiences on appraisal of EIA (Environmental Impact Assessment) on petrochemical industrial proposed projects, it points out the keystones and outlines of what should be stressed and held on EIA under existing investment system in China, and shows pollution prevention technology and cleaning-production technology of petrochemical industrial in instances. Also, it brings out the tasks, which should be more enhanced on petrochemical industry in the future.

214. (Paper)

**Ecological Function Districts and Eco-Construction in River Corridor in the Middle and Lower Reaches of Tarim River**

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The middle and lower reaches of Tarim River are an important area of eco-construction in the arid region in the west of China. Taking rivers (corridors) as the study subject, the principles, standards and methodologies of eco-function regionalization are discussed in this paper, using landscape ecology theory and methods.

Based on the above discussion, analyzing the basic features of the ecological environment in the middle and lower reaches of Tarim River, the division principle for landscape ecological function in river corridor were presented, 3 eco-functional regions were divided, and the ecological protection and construction emphasis, target and measures of each ecological region were also recommended.

378. (Paper)

**Making EA Work for Sustainable Development: A Synthesis of Experiences from Seven Countries in Asia (China, India, Jordan, Lao PDR, Malaysia, Nepal and the Philippines)**

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The purpose of the paper is to show and discuss experiences in different Asian countries from introducing changes and improvements of the EIA/SEA systems. The presenters will be 5 - 10 Asian participants in the EIA and SEA Alumni Follow-up Workshop, to be held in Hanoi, Vietnam, May 28 - June 2, 2007. The presenters have previously participated in one of the 5-week International Training Programme arranged in Sweden by Ramboll Natura and financed by the Swedish International Development Cooperation Agency. The majority of the presenters are decision-makers and specialists in environmental authorities and environmental organizations, as well as planners and managers in environmental divisions within central or local authorities, and sector ministries or organizations. As part of the International Training Programme each participant developed a "change project." One of the objectives



of the Follow-up Workshop is to exchange experience relating to the participants' "change projects" and institutional change processes in general. The Workshop will also deal with the "Managing Change" concepts relating to organizational dynamics, and how networking may assist participants in improving the use of EIA and SEA within their organizations.







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