



United Nations Environment Programme  
Dams and Development Project (DDP)

Comprehensive Options Assessment  
of Dams and their Alternatives

## Proceedings

September 22–24, 2003, Geneva, Switzerland



Organized by UNEP-DDP

Supported by GTZ, SIDA, The World Bank



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UNITED NATIONS ENVIRONMENT PROGRAMME

**DAMS AND DEVELOPMENT PROJECT**

ISSUE BASED WORKSHOP # 1

**COMPREHENSIVE OPTIONS ASSESSMENT**

OF DAMS AND THEIR ALTERNATIVES

SEPTEMBER 22 – 24, 2003

International Conference Centre Geneva  
GENEVA, SWITZERLAND

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**February 2004**

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Layout and Printing: UNON Printshop  
January 2003

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## Introduction

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### Issue-Based Workshop on Comprehensive Options Assessment

The following pages contain a description of the proceedings of the Dams and Development Project's workshop on WCD Strategic Priority 2: comprehensive options assessment. The proceedings begin with the conclusions of the workshop followed by a summary of the meeting. The annexes to the proceedings include the meeting agenda, the list of participants, descriptions of the case studies presented at the workshop, and the deliberations and output of the working groups.

It is expected that this extensive set of materials will contribute to the implementation of comprehensive options assessments as part of the processes by which decisions on dams and their alternatives are made. More importantly, it is expected that these materials will contribute to transparent discussions of dams and development issues and to the enhanced, mutual understanding of all parties to these discussions around the world.

## Workshop Conclusions

### Defining Comprehensive Options Assessment and Identifying Challenges and Opportunities

#### **Why should decision-makers perform comprehensive options assessments?**

Decision-makers would benefit from performing comprehensive options assessments because these processes:

- improve development outcomes and ensure that these outcomes are responsive to needs;
- achieve wider legitimacy for selected options and reduce controversy; and
- create a sense of ownership by the stakeholders and facilitate their buy-in to the results.

#### **Why did the DDP Forum decide to convene the workshop?**

Achieving these development outcomes requires closing the gap between aspiration and reality in the present-day implementation of options assessment. The DDP provided a unique opportunity at a global level to bring stakeholders from diverse backgrounds together with a common aim of building on the direction provided by the WCD's strategic priority and developing guidance for those involved in dams and development issues at national, sub-national and local levels.

#### **What is an options assessment?**

An options assessment is part of a decision-making process that works towards identifying the most appropriate options to satisfy defined needs. These processes are conducted at policy, strategic planning and project levels

#### **What are the characteristics of comprehensive options assessments?**

Comprehensive options assessments:

- are driven by a needs assessment that reflects local, sub-national and national goals and is influenced by international commitments.
- are transparent; they are built on explicit assumptions and result in documented decisions.
- include the full range of alternatives relevant to the articulated need, such as demand-side and supply-side measures; structural and non-structural alternatives; and conventional and non-conventional options.
- are participatory involving, among others, project-affected groups at local levels; and representatives of interest groups at the strategic

planning and policy levels.

- recognize and address limitations of knowledge base and available resources.
- are iterative processes with time-bound outcomes designed to meet both short- and long-term needs.
- integrate consideration of environmental and social factors together with technical, economic and financial factors.

#### **Who is responsible for conducting comprehensive options assessments?**

At policy and strategic planning levels, options assessment is a government-led, decision-making process. At the project level, the project proponent is responsible for conducting the options assessment and government provides the enabling environment.

#### **What are the implications of comprehensive options assessments?**

Comprehensive options assessments provide an instrument for more inclusive consideration of all alternatives earlier in the planning cycle.

Comprehensive options assessment requires an enabling planning environment, particularly at policy and strategic planning levels. To be implemented, there is a need for capacity building, including more information on alternatives, inter-sectoral co-operation, participatory processes, and ranking and screening tools.

The implications for funding and budgets are that comprehensive options assessments increase up-front costs in order to reduce longer term costs associated with delays and conflict; that small-scale, dispersed options require access to micro-credit for implementation; and that public resources will need to be devoted to options assessments at planning levels within and across each sector.

The comprehensive options assessment process will also need to be formalized in legal and regulatory frameworks.

#### **Challenges and Opportunities**

The following key issues, which may be both obstacles for OA implementation and triggering factors need to be addressed:

- governance systems, in terms of transparency and accountability;
- extent that country legal systems enable effective consultation procedures;
- influence of donor policies and access to funding;
- regulatory structures and reforms as regards the participation of private sector;
- NGOs as regards their ability to analyse and contribute to OA, facilitate debate and promote community options;
- the physical context that can limit some options but trigger other creative initiatives;
- compartmentalized knowledge that reduces understanding of options, introduces bias and impairs transparency of process; and
- the needs and problems of indigenous communities acting as options promoters.
- lack of information or incomplete information on one option compared to others;
- influence of models that are either overly complex or too simple to convince stakeholders to accept their results;
- cost and time required for data collection; and
- assessment tools, such as models, that can facilitate better and deeper understanding of the comprehensive options assessment process and pave the way to incorporate and disseminate the methodology or, because of lack of familiarity with models and tools, and of willingness to apply them, generate the reverse reaction.

Other considerations relevant to comprehensive options assessments include.

**Linkages between levels:** it is recognized that there are many interactions between the policy, strategic planning and project levels.

**Data needs:** A knowledge base is required as a reference tool to raise awareness on what each of the various options can deliver, including the opportunities they present and their limitations.

**Funding requirements:** Financial assistance may be required at an early stage to improve the knowledge base on traditional initiatives. Where external support is required, the importance of strategic options assessment needs to be reflected in country assistance programmes.

**Timeframes and short-term needs:** The needs assessment process should be recognised as a discrete step in the process. Planning processes are dynamic and there should be a recognition that policies and strategies are updated periodically along different timeframes to

strategic and project planning processes. Projects that satisfy agreed immediate short term needs can be implemented in parallel to longer-term strategy development.

**The need for institutional and capacity building:** To remove any bias created by imbalances in political and financial influence, there is a need to level the playing field by creating a transparent process where all stakeholders have an equal opportunity to influence the decision. This may require:

- Building the capacity of weaker stakeholders so that they are empowered to participate in the process.
- Reducing the institutional disincentives for government officials to engage in cross-sectoral exchanges.
- Enabling multi-stakeholder participation upstream in the decision-making process, and bringing policy-making closer to grass roots level.

Moving from a single sector approach to planning to an options assessment process that reflects cross-sectoral realities will require new approaches and institutional capacity. As part of this learning process, research and feedback on traditional and new options needs to be enhanced.

### What can DDP do?

Some suggestions from the workshop include informing national processes on dams and development about comprehensive options assessments, promoting pilot projects, comparing existing with proposed processes, and disseminating case studies.

Next steps for the DDP are:

- Dissemination of workshop proceedings with case studies
- Publication of an infosheet with workshop summary
- Build on DDP database on good practices
- Promoting issue-based workshops at country level
- Using synergies with other UNEP programmes to carry forward pilot projects, like GEF proposals

## Summary of the Workshop Proceedings

In the first Dams and Development Forum meeting, four WCD Strategic Priorities were identified as key issues to be dealt with in the context of the dams and development dialogue: comprehensive options assessment, gaining public acceptance, addressing existing dams, and ensuring compliance. The proceedings of the Forum meeting reflect the findings of the working group discussions indicating concerns and priority topics for further detailed discussion. Based on the recommendations of the Steering Committee at its third meeting, DDP has planned issue-based multi-stakeholder, international workshops addressing those strategic priorities. An additional workshop, dealing with financing dams and sustainable development, has been added as an outcome of the fourth Steering Committee meeting. The workshop on comprehensive options assessment was convened on September 22 through 24 2003 in Geneva, Switzerland.

The goal of the workshop was to facilitate an international multi-stakeholder debate on comprehensive options assessment with the goals of assessing the state of the art, mapping the challenges to produce criteria for implementation that are broadly accepted and articulating strategies to facilitate incorporation into the planning process.

The expected output was a set of principles and recommendations to facilitate a more specific stage of discussions on comprehensive options assessments at the national level. The findings of the workshop also served as input to discussions on the same topic at the second meeting of the Forum that was held on 25-26 September in Geneva.

The rationale underlying the workshop was to narrow the broad range of issues involved in options assessment into a more limited set of key aspects. The objective was to engage participants in a detailed analysis of the international and national contexts in which policy alterations, institutional capacity building and technological opportunities must be realized and in which potential constraints and requirements must be identified to achieve successful implementation.

Four seminar, plenary-type sessions were convened during the first day, each session addressing one of the following four themes: planning levels and scopes of analysis, identification of options – focus on process, assessment tools and process implementation. In each of the four plenary sessions, participants and invited experts presented a small number of pre-selected case studies dealing with field experiences in options assessment. During each of these sessions, presenters identified lessons learned from their experiences. Following the case studies, the workshop facilitators opened the floor for the discussion of the findings and lessons learned, thus providing input for workgroup discussions and for elaboration of the final recommendations.

After the initial plenary sessions, the participants broke into four working groups. Rapporteurs from each working group presented preliminary working group conclusions in a plenary session at the end of the second morning. These provided an opportunity to exchange preliminary ideas between groups prior to more detailed discussion in a second round of working groups. A final plenary session in the morning of the third day allowed the participants to build on the achievements and conclusions of four working groups and propose a way forward.



### Opening Address by Franciose Belmont

"On behalf of UNEP in Geneva rather than Nairobi, we are very glad to host this important workshop on option assessment of dams and their alternatives. DDP is engaged in promoting global dialogue in improved decision-making, planning and management of dams and their alternatives, based on the World Commission core values and strategic priorities. This particular meeting focuses on options assessment, an issue that was recognized in the First Dams and Development Forum and has also been flagged at international meetings thereafter as an outstanding starting point for any sound decision-making process concerning dams and sustainable development. As you know the outcome of this meeting will inform Second Dams and Development Forum that is being convened immediately after, on September 25 and 26, where our Executive Director, Dr. Töpfer, will be present.

Balance is another relevant feature that characterizes DDP activities and involvement. We would like to see in this room a fair representation of all 13 stakeholder categories involving governments, civil societies and the private sector. This is the first of the series of issue-based workshops that DDP is planning until July 2004. The outcomes and lessons learned from this meeting will contribute to improve further dialogue at the national level and provide valuable input to the DDP work program. A workshop on gaining public acceptance is planned for November 2003 in Chiang Mai in Thailand.

And now I will join your fruitful deliberations and valuable outputs for this multi-stakeholder meeting, I hope you will enjoy your stay in Geneva although they announced some rain. Thank you very much."

### Opening Session

Alberto Calcagno opened the session by welcoming participants and introducing Franciose Belmont, the Deputy Director of the UNEP Regional Office for Europe.

DDP Coordinator followed Ms. Belmont's presentation with a brief presentation on the Dams and Development Project's objectives and work plan. He then introduced Mr. Bikash Pandey, DDP SC member representing groups working on options, who explained the background concept, purpose and goals of the workshop.

Mr. Pandey said that the Dams and Development Forum had identified comprehensive options assessment as a priority issue requiring further discourse during the meeting of the Forum that was held in Nairobi on July 8 and 9, 2002. During that meeting, the Forum determined that DDP has a role to play in finding and making available studies on options assessment, encouraging governments to carry out options assessments upstream in their planning processes, and compiling case studies showing how multi-stakeholder processes can be used in options assessments. Main issues to focus on identified at the Forum meeting included levels of options assessment, the process for stakeholder involvement, challenges for implementation, identification of community-based options commensurate with mainstream options, and recognizing the risks of either implementing projects or not implementing them.



Specific questions that members of the Forum wanted the workshop to address included the following. How should non-uniformity in information available about different options be handled? How should the key role of government be maintained without leaving out indigenous and other groups? How should transparency be ensured? Who is responsible for carrying out options assessments? What is the timing for options assessment and when is the process complete?

Mr. Pandey said that the broad purposes of the workshop were to facilitate implementation of a strategic priority identified by the World Commission on Dams. The DDP established the workshop to facilitate an international multi-stakeholder debate on

comprehensive options assessment with the objectives of assessing the state of art, mapping the challenges to produce criteria for implementation that are broadly accepted, and identifying ways and means to move ahead on institutionalization of comprehensive options assessments into planning processes.

The outcomes hoped for included, most importantly, a set of principles and recommendations to guide the national dialogues taking place under the auspices of the DDP. In addition, the DDP's intended output from the workshop included input into discussions of the 2<sup>nd</sup> Forum meeting, a narrowing of the broad range of issues involved in OA into a more limited set of key aspects, and lessons learned internalized through discussions from the floor and recommendations from workgroups.

Following Mr. Pandey's presentation, the DDP Coordinator explained the organization of the meeting. The workshop was organized around four themes: planning levels and scope of analysis, identification of options with a focus on process, assessment tools and process implementation. The four plenary sessions that would be convened on the first day of the workshop were based on each of the respective themes so that participants could explore each theme as a group and develop an understanding of the interrelationships between themes prior to splitting up into working groups. Each of the working groups would address one of the themes. A fifth plenary would take place halfway through the working group sessions so that the participants in each working group could share their preliminary results and harmonize with the other working groups. After continued deliberations, the working groups were to report out in a plenary session. The compilation of a consolidated report from the four working groups would provide the fodder for a final plenary on the way forward.

### Plenary Session 1: Planning Levels and Scope of Analysis

Within the country context, development plans usually respond to a top down hierarchy where national goals supersede, but are supported by sub-national (state or province, basin) goals, and these in turn, supersede, and are supported by, local or community goals. Needs at each of these levels respond to driving forces of local, sub-national, national, regional and even global scope. They are usually approached on a sector basis. Sectors relevant to water and energy resources management include water supply and sanitation, agriculture, disaster prevention and mitigation, transportation, recreation, fisheries and environment. The assessment of needs provides the framework for assessing options and their linkage to the development objectives for specific beneficiary groups. Needs assessments necessarily affect the interests of different social groups, and should thus be carried out in the context of an appropriate participatory process.

Available options to satisfy such needs are associated to the scale or boundaries of the natural resources and social systems involved. Therefore, the options assessment process will operate at different planning levels and involve different geographical scopes of analysis. For the purpose of the workshop, the main levels identified were the policy level, the strategic regional and sector planning level, and the project analysis level.

The DDP requested workshop participants to discuss four specific issues during this session. The first was characterization of planning at various levels, such as the policy formulation, strategy and sector master planning and project planning levels. The second issue was the scope of needs and options assessment analysis



required for each planning level. The third issue concerned the links and relationships among different planning levels and how communications between the various levels could be made consistent, well integrated, and capable of facilitating feedback between the levels. The fourth issue was the time horizon: the interrelation of the planning horizons of the various planning levels and accounting for the long lead time of some projects and short term needs.

The three case studies presented during this session included options assessment for large dam projects at policy levels,<sup>1</sup> strategic environmental assessment to support decision-making in hydropower generation expansion in Brazil,<sup>2</sup> and the power sector environment assessment scoping and reconnaissance study and power rehabilitation project in Zambia.<sup>3</sup>

A discussion followed the presentations and the following issues were raised. First, because many river basins are shared by two or more countries, the assessment of needs and options by one country can be partially driven by developments in another country. In addition, there is often a need to consider international implications beyond the basin level of certain options for managing trans-boundary basins.

Second, the sense of the workshop was that the purpose of assessing options was not to select one project type to the exclusion of others, but that a mix of projects was necessary to satisfy needs. This discussion focused on whether decision-makers should favor centralized, large-scale projects or decentralized, small-scale projects. A point made in this regard is that the source of funding for certain options, for example local versus international sources, is also important in the process of assessing options.

Third, it was suggested that options assessment processes led by the government are necessary in developing countries but that in developed countries, the market selects the options. Workshop participants ultimately rejected this view because it was felt that, even in market economies, the government implicitly favors some options over others using policy instruments such as prohibiting development of

certain rivers or requiring utilities to a specific proportion of electricity from a certain power source. In addition, commercial markets do not always reach the poorest communities and they often externalize social and environmental considerations. Thus, it was felt that explicit and comprehensive options assessments should be conducted transparently and in a participatory manner.

The opinion was expressed that sometimes the benefits and costs of options are unevenly distributed. For example, the benefits of a large hydropower scheme feeding electricity into a national grid are shared at the national level, but most of the costs are borne by the river basin where the project is built.

## Plenary Session 2: Identification of Options – Focus on Process

Options consist of technological, policy and institutional responses, which may be categorized further based on whether they contribute to demand-side management, supply-side efficiency, alternative supply options including rehabilitation and upgrading of existing facilities, or conventional supply options.

The identification of all feasible options is often hampered by challenges and constraints. There are factors affecting societal choices, like natural resource endowments, technological capability, institutional capacity, finance, market conditions, cultural preferences, awareness and education.

There are also obstacles preventing the more widespread adoption and use of certain options: market, policy, institutional, intellectual and regulatory barriers; capacity and resource constraints; the dominance of conventional approaches and interests in development planning; lack of awareness and experience with non-conventional alternatives; and inadequate access to capital and a lack of openness in the planning system. There is a need to address these factors and obstacles to ensure that viable choices are not a priori excluded from the analysis, thus securing a comprehensive set of options for further assessment.

<sup>1</sup> Wilkinson, R., 2003. Options Assessment for Large Dam Projects at Policy Levels Intermediate Technology Development Group, Schumacher Centre for Technology Development.

<sup>2</sup> Helena Pires, S., P. Mello Calil Farah, E. Lèbre La Rovere & F. Eduardo Mendes, 2003. Decision-making in the Hydropower Expansion. Centro de Pesquisas de Energia Elétrica, CEPTEL & Laboratório Interdisciplinar de Meio Ambiente, PPE/COPPE/UFRJ.

<sup>3</sup> The World Bank, 2003. Zambia: Power Sector Environment Assessment Scoping and Reconnaissance Study and Power Rehabilitation Project. Pp. 178-186 in Joint UNDP/World Bank Energy Sector Management Assistance Programme and Bank-Netherlands Water Partnership Program, 2003, Stakeholder Involvement in Options Assessment: Promoting Dialogue in Meeting Water and Energy Needs. Washington, DC.

Case studies presented at this session included the Lower Orange River Management Study in Southern Africa<sup>4</sup> and a study of a comprehensive solution to the problems of the Wloclawek dam and reservoir in Poland, including anticipated social, economic and environmental effects.<sup>5</sup>

Following the presentations, the session chairs opened the floor for debate. Considerable time was devoted to clarifying and discussing particular aspects of the case studies that had been presented. Among other issues raised, it was mentioned that, in addition to time and money, data availability and quality could be constraints to comprehensive options assessments. A question was posed regarding whether certain options should be screened out as unviable only for technical grounds, or if they should also be excluded from further assessment if they are considered politically unviable. The response was that politics change, so that a project that was considered politically unviable one year might become viable the next year, so political viability should not be considered a necessary criterion for identifying options. It was remarked that the nature of the organization conducting the options assessment could affect perceptions of bias or objectivity in the assessment. This consideration can be overcome either by choosing an organization that is perceived to be objective to conduct the assessment, or by involving a sufficient range of stakeholders such that the perceived bias of one stakeholder effectively balances the perceived bias of another.

### Plenary Session 3: Assessment Tools

Options assessment is a component of planning approaches that assesses all policy, institutional, management, and technical options before the decision is made to proceed with any set of programs or projects. Consequently, the assessment should be based on the respective merits of available options in the given context and involve full integration of social and environmental criteria into the set of technical, financial, and economic criteria.

A number of tools and criteria are already in place to facilitate such integration into the assessment process. Some of the tools described in the WCD report were valuation of social and environmental



impacts, strategic impact assessment, cost/benefit analysis, multi-criteria analysis, life cycle assessment, distributional analysis and risk analysis. Experience in the use of the use of these tools, independently or jointly, is mostly limited to project level analysis and, particularly at higher levels of assessment, all of these tools have their limitations. Assessment of cumulative potential impacts in developing multiple projects, consideration of benefit sharing mechanisms and distributional analysis and incorporation of risks into the assessment of different options are some of the influential aspects to be accounted for. All these issues condition the ability of the various tools to contribute to the decision making process in terms of time, cost, flexibility, reliability and applicability to the various planning levels, particularly when information may not be equally available on various options under consideration.

The specific topics proposed by the DDP for discussion in this session included criteria for selecting assessment tools for use at the various planning levels; the assessment of monetary values and subjective assessment techniques for environmental and social impacts; the incorporation of risk analysis, considering data reliability, demand forecast, climate change, financial conditions and operational capacity uncertainties among others; and the incorporation of benefit-sharing mechanisms, integrated distribution, and cumulative impacts analysis.

The case studies presented included Stage 1 of the Vietnamese National Hydropower Plan Study: a new approach to sustainable hydropower development,<sup>6</sup> and the Environmental Manual for Power Development: a tool for comprehensive options assessment in the

<sup>4</sup> Tanner, A., P. Van Niekerk, & P. Heyns, 2003. The Lower Orange River Management: Water Resource Management Challenges and the Methodology for Identification and Selection of Management and Development Options. Lower Orange River Management Consultants, Department of Water Affairs & Forestry, South Africa & Ministry of Agriculture, Water & Rural Development, Namibia.

<sup>5</sup> Engel, J. & U. Collier, 2003. A study of a comprehensive solution to the problems of the Wloclawek dam and reservoir: anticipated social, economic and environmental effects. WWF Poland Programme.

<sup>6</sup> Vu Duc, T. & G. Lifwenborg, 2003. National Hydropower Plan Study, Vietnam, Stage 1: A new Approach to Sustainable Hydropower Development Management Board of National Hydropower Plan Study, Electricity of Vietnam, Hanoi and SWECO International Stockholm.

energy sector.<sup>7</sup> In addition, the chair added a third presentation on the sustainability guidelines of the International Hydropower Association.<sup>8</sup> Because this last presentation was not submitted to the selection process for case studies, it was not included in the background document for the workshop or in the final publication of case studies from the workshop.

As in the other sessions, the floor was open for discussion following the presentations. One issue raised regarded how decision-makers can prevent bias from being introduced in the weighting and scoring of various options. It was suggested that all scoring systems introduce bias into the selection process, and that one way to neutralize that bias is to rank options using several different scoring systems. Another is to design the system to confine or minimize bias so that different people applying the system to a set of options will come out with virtually identical results. A third suggestion was that the parties performing the assessment should relay as transparently as possible what the perception of the potential impacts are for the stakeholders and, as a relative analysis, whether the perception of risk is high or low. Decision-makers would then aggregate various subjectivities and try to assess what the real risk is.

Another issue raised concerned the scope of options assessed using the tools. In some of the examples presented, hydropower projects were assessed against each other, but it was felt that the assessment should be broad enough to include non-hydropower alternatives and that there is a challenge in moving from the current focus, which limits the analysis to hydropower projects, to a focus on looking more broadly at the full range of options for addressing water and energy related needs. The question was raised of how this could be accomplished in the agriculture sector, where consideration of alternatives extends into the broader area of national planning. The sense of the group was that time would be required to develop the institutional capacity to deal with much higher levels of complexity than are presently involved in decision-making. Even at a basin level, a vast number of decision-makers must be involved in the process and this number would just explode if societies move to a real, cross-sector, integrated approach.

In the short term, the objective should be to work with the moderate levels of complexity already involved in the process.



It was pointed out that flexibility is needed to accommodate future changes in key factors such as fuel costs, political leadership and others. In a related concept, it was expressed that the decision-makers of the present day are qualified to choose options for the medium term, but in the long term others will assume the responsibility for these decisions.

The issue of what to do when the best options chosen using the assessment tools have been implemented, and needs for water and energy services remain unmet, was raised. Concern was expressed that, in such a circumstance, projects that had been rejected previously because of environmental or social impacts, might be resurrected and constructed. The sense of the group was that it would be irrational to build an unsustainable project and that, in the case that the end of the list of acceptable projects is reached; additional options need to be considered.

The issue of the need to perform assessments of economic risks came up, and it was pointed out that the sophisticated tools needed for economic risk assessment do not yet exist. A response to this suggestion was that the investors who currently perform risk analysis as they choose what projects to invest in are already responsible for economic risk assessment and that financial sector itself is extremely diverse and developments quite extreme in their fluctuations. Therefore, even if one uses good tools, the results of the analysis would be more confusing than helpful. These processes do not produce

<sup>7</sup> Fritsche, U.R., T. Herberg & F. Neuman-Silkow, 2003. Environmental Manual for Power Development (EM): A Tool for Comprehensive Options Assessment in the Energy Sector. Institute for Applied Ecology, Darmstadt, Germany and Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), Eschborn, Germany

<sup>8</sup> International Hydropower Association, 2003. Draft Sustainability Guidelines. London.

clear signals that help decision-makers to distinguish between technologies and options; therefore they should not be required as components of comprehensive options assessments.

#### Plenary Session 4: Implementation

One major drawback when addressing the issue of implementing comprehensive options assessment analysis is the lack of generalized experiences in the field. Most option assessment exercises available in the literature are associated to project level optimisation, limited to specific sectors such as electricity generation, or involved generic strategic desktop studies such as in life cycle analysis. Therefore, if options assessments should be incorporated early and upstream in the water resources planning process, every effort should be made to configure an enabling environment for its implementation, in terms of political will, capacity building, stakeholders support, data collection and fund allocation.

Until these conditions are achieved, there will be a need to establish proper conditions to keep transparent, objective and participatory ongoing decision processes to address short term needs without compromising long term and sustainable development objectives.

The DDP proposed several, specific topics for discussion in this session. These included obstacles for governments and societies embarking on comprehensive options assessments, including institutional, financial, technological and data constraints; financing options assessment processes at the various levels; triggering factors and how to deal with short-term needs; stakeholder participation, involvement and responsibilities in the process; and institutional and capacity building, or how to move forward with the assessment while improving the enabling environment.

The China Loess Plateau Watershed Rehabilitation Project<sup>9</sup> was presented as a case study. In addition, an invited paper on development through self-reliance, reviving hope and prosperity through traditional water harvesting systems as alternatives to big dams was presented,<sup>10</sup> and a special presentation on the World

Bank Sourcebook on Stakeholder Involvement in Options Assessments for Meeting Water and Energy Needs<sup>11</sup> was made.

The discussion that took place after the presentations addressed the following outstanding issues. The point was raised that often, when projects are discussed that are aimed at benefiting local people, and poor communities in particular, the intended beneficiaries are not involved because there is no arrangement made to bring them to the meetings where decisions are being taken. The response to this point was that processes at the community and basin levels that involve local beneficiaries in decision-making are relatively new, but that they are sprouting up in various parts of the world, so there is room for optimism. In addition, it was suggested that



resources should be made available to bring local beneficiaries into the process.

The comment was made that, because the energy sector involves revenue-generating organizations that are accustomed to expedited planning and implementation processes, the prospect of a planning horizon that has been substantially extended to accommodate options and needs assessments and multi-stakeholder consultations could result in the abandonment of a good hydropower project in favour of an inferior option. The response to this comment was that some initiatives to meet urgent needs should be expedited while the longer and more comprehensive planning

<sup>9</sup> The World Bank, 2003. China Loess Plateau Watershed Rehabilitation Project (Loess I and II). Pp. 130-138 in Joint UNDP/World Bank Energy Sector Management Assistance Programme and Bank-Netherlands Water Partnership Program, 2003, Stakeholder Involvement in Options Assessment: Promoting Dialogue in Meeting Water and Energy Needs. Washington, DC.

<sup>10</sup> Kishore, A., 2003. Development through Self-Reliance, Reviving Hope and Prosperity through "Traditional Water Harvesting Systems" Alternative to Big Dams. Tarun Bharat Sangh, Jaipur, India.

<sup>11</sup> The World Bank, 2003. Joint UNDP/World Bank Energy Sector Management Assistance Programme and Bank-Netherlands Water Partnership Program, 2003, Stakeholder Involvement in Options Assessment: Promoting Dialogue in Meeting Water and Energy Needs. Washington, DC.

process is unfolding. It was also expressed that, if initiated early enough in the process, stakeholder consultation does pave the way for more expedient implementation. The alternative to consultation in many cases is that, rather than experiencing delays caused by dialogue, the project is halted completely because of opposition.

An experience was presented of extended delays resulting from consultation with stakeholders on resettlement and reparation issues. The opinion was expressed that, when a development project is considered for an area, the expectations of local people in the area skyrocket and it becomes impossible to satisfy them. This situation results in long delays. In response, it was suggested that, given that planning horizons for large projects are in the range of decades, this was a specious argument and that the timeframe required for consultation was relatively marginal. In addition, it was pointed out that it is not only the affected people in the project who attempt to maximize their own benefits, but the project developers and others. It was felt that participants who stonewall the process are in the minority, and that in genuinely participatory process, the majority of people respond well. In addition, it was pointed out that in most cases increases in demands for water and energy services are gradual, so there is usually a sufficient planning horizon to include consultation. A comment was also made to the effect that, when local people do not feel that they are benefiting from a project but someone else is benefiting from it, it is natural for them to try to get something out of the process.

It was expressed that the long time period involved in building large infrastructure projects was one reason that preference should be given to small-scale, decentralized options. Further, the opinion was voiced

that the UN Millennium Development Goals could only be met by small-scale initiatives that can be implemented relatively quickly and that the priority should be to provide energy and water services to those who do not have them, rather than to supply the increasing demands of city-dwellers. The opinion that large projects are needed to support a country's economic development was disputed, and an example of where small-scale, decentralized projects resulted in the rapid and substantial economic growth of an area was referred to.

In response, it was pointed out that developed countries used a mix of large-scale and small-scale approaches to supply needs and strengthen their economies and that it would be hypocritical for these countries to turn to the developing countries and deny them the option of building large-scale infrastructure.

The opinion was given that the implementation of small-scale, decentralized options on the ground would provide promoters of these options with the opportunity to prove the worthiness of the options. Thus, over time, such options would be considered more seriously than they are at present.

Regarding the issue of creating an enabling environment for comprehensive, multi-stakeholder options assessment, it was pointed out that the obstacles include issues of vested interests, of corruption, and of people who want to maintain the status quo because it benefits them and they do not want options assessments to take place because they know that their options would not be selected.

It was pointed out that often projects enter the public domain after they have already been formulated. Some projects are brought to multi-lateral development



banks for financial assistance fully formulated and approved by the government of the country where they are to be implemented. Others are undertaken by the private sector, which has sufficient resources to implement the project but needs energy and water services to support their efforts. It is often the case that private companies do not reveal their investment decisions until they are ready to implement a project because they do not want to jeopardize their competitive advantages. Therefore, it is essential for stakeholders to be involved at policy levels and that they help to set the framework within which the development decisions will be made. In this regard, a danger was identified that a consultative process can produce a wonderful plan, but one which nobody is interested in implementing. It could be that the process either neglects the interests of the private sector or the interests of the people.

The discussion again involved the importance of basing options assessments on the identification of needs, a process that is discrete and cross-sectoral. It was suggested that needs assessments address questions such as the need for water for irrigation, the need for electricity from hydropower plants, or the need for storage for flood control.

A question was posed regarding how to handle powerful forces that hijack the decision-making processes, and the example of military governments rejecting options preferred by local communities in favor of large infrastructure was given. The reply was that it is important to engage even dictatorial governments because, through policy dialogues with these governments, some reforms can be put on the table.

### **Plenary Session 5: Feed back on Working Group Preliminary Conclusions and Interaction between Groups**

During this session, each working group presented its preliminary findings. Because of the preliminary nature of the findings, there was no plenary discussion. Issues that were identified included the following.

Stakeholder equity was considered to be important. Some stakeholders are weak and approaches need to be found to strengthen them so that they are equally able to influence process outcomes. Two related issues were the need for capacity building at all levels and the considerable political influence of financiers, funders, and multi-national corporations on options assessment processes. Additionally, the question arose of how to integrate priorities between



sectors, geographic areas and various administrative areas. The linkages between options assessments at the various levels and macro-economic policies were discussed, as was the difficulties involved in engaging different stakeholders.

One obstacle to cross-sectoral integration identified was that the perceptions of the stakeholders are shaped by experiences they have and by the institutions they represent. In order for comprehensive options assessments to operate correctly, participants need to be open to new ideas and to the perceptions of others.

The importance of a proper needs assessment was re-emphasized. It was also recognized that the policy, strategic planning and project levels link up throughout the options assessment process, and that the processes and institutions established at the strategic planning and project levels should reflect those established at the policy level. The working groups found it difficult to draw a clear boundary between the project and strategic planning levels.

Because comprehensive options assessment is a dynamic process, the timeframe was also identified as an issue. It was stated that policies may not exist for more than 10 years and a strategy may not exist for more than 5 years, yet the planning process for dams is often 10 to 15 years and is taking place in that dynamic context. The question of how this situation of varying timeframes could be harmonized was raised, since particular

projects may be deferred for a few years and then be put back on the table at a later time within the environment of completely new policies and strategies.

It was found that the desirable characteristics of assessment tools include completeness and comprehensiveness, which means that capability to include all potential options. Another key feature was the ability to equally reflect economic, environmental and social aspects. It was acknowledged that the environmental and social aspects most likely would not be expressed in dollar values. Therefore, a tool must include other methods for evaluating the effects of various options on social and environmental conditions.

It was emphasized that tools are not automatic decision-making machines, but the basis of, or support for, a decision-making process. Therefore, the capability of the tools should not be over-exaggerated. It was recognized that, through the weighing of different factors, different results would emerge when different people are operating the tools.

The policy level was defined as a national policy level despite the fact that policies can be made at any level, such as the basin or village level. The opinion was expressed that development of a vision or the implementation of goals occurred at this level, but that it is not always the government of the country that develops the vision or sets the goals.

Scenario analysis was proposed as a tool to support the creation of a vision for the long-term future by positing certain alternative scenarios, none of which is considered a forecast, or the “true” picture, of the future. The attractiveness of scenario analysis stems in part from the failure of past long-term, energy demand forecasts to correctly predict future conditions. Desirable characteristics of scenario analysis identified included that they be demand-driven, but that they do not simply extrapolate contemporary trends but also consider future possibilities, such as expansion of demand-side management approaches.

It was felt that it is imperative that future technological developments not be excluded by today’s descriptions of the future. It was pointed out that scenario analysis must take into account the full cost of every option in the widest sense, not only economic values but also social and environmental values even if it is not possible to quantify these in monetary terms. Finally, the scenario analysis must include a risk assessment characterizing the risks involved in each scenario.

It was suggested that the strategic level is open to all technologies, but at the project level there is a defined technology. The strategic level addresses options for meeting needs of a large area, such as the entire country, and the project level addresses a smaller area, such as a tiny river basin. The strategic level was identified as the level at which the most public debate and participation of stakeholders is required in order to avoid the criticism that the ultimate choice of a project was pre-determined. Timeframes also distinguish between these levels, with decades required for decision-making at the strategic planning level and years required at the project level. Another criteria was the owner of the process, which at the strategic planning level should be primarily the government and at a project level should be primarily private or public project developers. One last distinction drawn between these levels by was that the strategic planning level could embrace demand-side approaches, while the project level would focus on the supply-side.

The tool for assessing these options could be a multi-criteria analysis, which must include environmental and social impact assessments. This tool must be more detailed at the project level than it is at the strategic planning level so that it can lead to optimization of the final project. It was suggested that a strategic decision sets a boundary or framework for project activities. After a project has been selected, there is a danger of finding that the analysis at the strategic planning level was seriously flawed because of a lack of data, which could disturb the entire process operating at all three levels.

The view was expressed that the exercise of developing comprehensive options assessments is a learning process that will require multiple cycles.

### **Plenary Session 6: Presentation of Working Group Final Conclusions**

Rapporteurs of each of four working groups presented the outcomes of their deliberations, which are included in annex four. During this session, the following, outstanding issues were discussed. The opinion was expressed that the options assessment process at the policy level was geared towards meeting targets that are based on priority needs. The needs enter the process and are prioritized at the macro-economic level. The priority needs feed into strategic government objectives and macro-economic objectives as well as international targets. The outputs at the policy level are the government’s



strategic, prioritised targets. The process at the policy level is primarily the government's responsibility supported by a transparent, multi-stakeholder, democratic process.

It was felt that the needs assessment should feed into sectoral planning. The sectors then enter an inter-sectoral negotiation process to prioritise the targets. It was expressed that there would be fervent lobbying at this point in the process and, because some voices are louder than others, transparency was absolutely crucial.

The objective at the strategic planning level was identified as defining how the targets established at the national level would be achieved. Sector agencies were identified as the responsible parties for conducting options assessment at this level. All options must be on the table at this point in the process. Resources assessment and prioritisation of options using a multidisciplinary and cross-sectoral approach were considered important. To facilitate a cross-sectoral approach, it was felt that government should reward people who can think laterally as well as vertically.

It was felt that, at the strategic planning level, there needs to be a recognized, institutional mechanism for allocating water among sectors and that mechanism would require periodic reviews of both demands and options for satisfying those demands. A portfolio of options is also needed, and that portfolio should be explicit so that everybody knows exactly what options have been considered. In addition, the screening process should be documented and made publicly available so that interested parties can

understand why certain options have been either rejected or taken to the next level of consideration.

At the project level, it was suggested that an iterative process was required that would go back and forth between defining options and checking with stakeholders on whether the options defined make sense. An explicitly defined timeframe is important to avoid essentially endless debates in which participants never accept that a solution has been identified.

It was expressed that, in the past, decision-making processes moved from the policy level straight down to the project level, and that a lot of the controversy surrounding dams and development arises from the lack of a stakeholder negotiation phase in honing down the choice of options. Building capacity to perform options assessments at the strategic planning level was identified as a priority.

All potentially affected people should be represented at the project level. In contrast, at the national policy level, representatives of stakeholders and users should be included in the process, perhaps with some representation of people who might be affected. Also, an effective mechanism for disseminating information is critical at the project level.

It was agreed that increased funding would be required for multi-stakeholder participation, data gathering, information sharing, and other aspects and that funding at the strategic planning level is a government responsibility, perhaps with assistance from donors. It was also identified that financial assistance is required

to improve the knowledge base on traditional or alternative options.

Assessment tools identified included scenario assessment at the policy level, and multi-criteria assessment at the strategic planning level that will lead to a ranking of projects. At the project level, a multi-criteria analysis is also necessary, but this time it is used to optimize one type of project. It was felt that, because these tools constitute a platform for making future decisions, they must be replicable and transparent. The tools should also provide a mechanism for the assessment of values for environmental and social dimensions so that these can be incorporated into options assessments.

It was expressed that the tools must also incorporate areas of risk and risk analysis, including risks relating to data reliability, the accuracy of demand forecasts, climate change, financial conditions and the uncertainties of operational capacities into all three levels of comprehensive options assessment, with the main emphasis at the project level. Risk analysis was found to be a complement to the degree of detailed data and accuracy of the data fed into the tool. At the policy level, for example, there is a lesser degree of detailed data. Therefore, the risk of inaccuracy is greater at that level than at lower levels where more detailed information is available.

It was suggested that benefit sharing as a principle should be treated at the policy and strategic planning levels, but benefit-sharing mechanisms can only be developed and applied at the project level when the details of the benefits and costs of the selected option are known.

In contrast, it was found that cumulative impact analysis cannot be accomplished at the project level because it considers the additive and synergistic effects of a number of separate projects and must therefore be



performed at the policy and strategic planning levels. A linkage between cumulative impact assessment at the strategic planning levels and decisions taken at the project level was identified, since a potential investor in an individual project should understand what cumulative risk is involved in his project and this information is developed at the strategic planning level

Ten key factors that can serve both as obstacles to and as triggers for a comprehensive options assessment were identified and it was noted that obstacles could be turned into triggering factors. These key factors include government and governance systems, international agreements, projects themselves, courts and legal systems, donor policies and access to funding, regulatory structures and reform, NGOs, physical contexts, knowledge and bias on options and processes, and indigenous people and local communities.

It was pointed out that financial institutions favour large loans, as well as specific technologies and policies, such as privatisation, that might influence options assessment processes. It was felt that access to micro-financing was important for making small-scale, decentralized projects viable and that the capacity for micro-financing was largely lacking.

## Final Plenary

During this session, workshop participants decided what the final outputs from the workshop to the Forum and the national dialogues would be.

It was agreed that needs assessment is a discrete process that precedes options assessment and that the state of the art of needs assessment is inadequate to support comprehensive options assessments. Governments must incorporate national needs that arise as a result of international relations such as obligations to meet targets set in international agreements and conventions, market considerations such as trade in food or internationally shared electricity grids, or responsibilities for management of shared river basins into their sovereign laws and policies because international agreements are relatively unenforceable on their own. It was felt that needs bubble up from the local level and are articulated at the national level and placed within the context of international obligations.

Comprehensive options assessment at the national level was defined as applying across sectors and responding to inter-sectoral needs. Thus, comprehensive options assessments for water and energy resource management should respond to the needs of the agriculture, fisheries,



water supply and sanitation, energy, disaster management, recreation, environment and transport sectors, for example. It was pointed out that gaps often exist at the national level between macroeconomic targets and strategies (such as poverty alleviation) and targets and strategies adopted by individual sectors.

It was agreed that, to a limited extent, comprehensive options assessments at various levels are iterative. It was also emphasized that, despite the iterative nature of comprehensive options assessment between levels, the process has to end at some point and an option chosen and implemented, or the needs identified will never be satisfied. The suggestion was made that, if a preferred option is inadequate for meeting a specific target, perhaps it is the target rather than the option that should be modified.

### **The Way Forward**

The final portion of the plenary session was devoted to garnering recommendations for the way forward, particularly recommendations for what DDP should do to stimulate the implementation of comprehensive options assessments around the world. There was strong consensus that the output from the workshop should be fed into the national DDP dialogues and also linked with the case studies. It was articulated that the purpose of the workshop was to build on a Strategic Priority elaborated by the World Commission on Dams and should be used to convince countries to start the process.

The need to produce a document or set of documents that would be useful in raising awareness among ministers that comprehensive options assessments are worth engaging in because they produce better development outcomes than sector-specific, project-focused decision-making processes was emphasized. A sort of marketing document containing only the key points could be useful in communicating with governments. It was suggested that this document should contain guidelines on how to start a comprehensive options assessment process, a description of the process, what will be gained from the process, and what are the main tracks within the process. This document should be translated and disseminated, along with the case studies and workshop proceedings.

The question was raised of whether there are good examples of comprehensive options assessments that could be used to illustrate the usefulness of such processes to governments. There was general agreement that the case studies considered by the workshop and published in the background document produced for the workshop by the DDP secretariat do not represent the ideal process envisioned by the workshop for various reasons (such as lack of government involvement or national level policy setting). Participants expressed that there is a need to implement pilot projects to approximate the ideal comprehensive options assessment and also a need to compare existing examples with the ideal to evaluate the gap between reality and aspiration. It was

also suggested that the DDP maintain a catalogue of experiences with options assessments emphasizing what has worked and what has not.

### **Input from the Workshop to the Forum**

It was decided that the chair and the DDP secretariat would prepare a summary paper containing the key recommendations from the combined reports of the working groups for presentation to the Dams and Development Forum, and it was suggested that a

broader paper be generated describing the challenges and opportunities facing decision-makers who engage in options assessments. Both elaborations would then constitute the outcome of the workshop.

It was suggested that the message to the Forum should stress the importance of comprehensive options assessment processes and that the Forum should discuss why comprehensive options assessments aren't being conducted and to identify the incentives and disincentives and key issues hindering their implementation.

## ANNEX 1: AGENDA

### UNEP -DAMS AND DEVELOPMENT PROJECT (DDP) ISSUE BASED WORKSHOP # 1

#### COMPREHENSIVE OPTIONS ASSESSMENT OF DAMS AND THEIR ALTERNATIVES

International Conference Centre Geneva  
Varembé Centre  
**Geneva, 22-24 September 2003**

**Monday, September 22 2003**

8.30 to 9.30      **Registration of Participants**

9.00 to 9.30      **Opening Session**

- Welcome to the participants
- Presentation of DDP Objectives and Work Program
- Defining the purpose and goals of the Workshop
- Background concept of Comprehensive Options Assessment
- Brief description of Workshop organization, activities and expected outputs

9.30 to 11.00    **Plenary Session 1: Planning Levels and Scope of Analysis**

#### **Background**

Within the country context, development plans respond to a top down hierarchy where national goals supersede, but are supported by subnational (state or province, basin) goals, and these in turn, supersede, and are supported by, local or community goals. Needs, at each of these levels, respond to driving forces of local, subnational, national, regional and even global scope. They are usually approached on a sector basis. Food (agriculture and fisheries), energy, domestic and industrial supply, recreation, ecosystems conservation, are usually the sectors addressed in the context of water resources management. Flood management is as well. The assessment of needs provides the framework for assessing options and their linkage to the development objectives for specific beneficiary groups. Needs assessments necessarily affect the interests of different social groups, and should thus be carried out in the context of an appropriate participatory process.

Available options to satisfy such needs are associated to the scale or boundaries of the natural resources and social systems involved. As far as supply of water resources is concerned, the basin constitutes the accepted planning and management unit, although the implementation of the concept is often problematic. It is widely agreed that the options assessment should start early in the planning process and be incorporated into master plans and sector plans using strategic impact assessments and other planning tools. Also that it should precede selection of any specific development plan and the concurrent set of policies, programs, projects and measures.

Therefore the options assessment process will operate at different planning levels and involve different geographical scopes of analysis. Three main levels may be, in principle, recognised: (a) policy level (b) strategic regional and sector planning and (c) project level analysis. The first involves the adoption of a policy framework based on the assessment of "policy options" that reflect the links with needs and development objectives, e.g. sustainable livelihoods and poverty reduction, and sets the framework for further planning. Closely interrelated with the second, both involve assessing the range of options, either on a sectoral basis addressing the corresponding sector needs, or screening simultaneously the contribution of all sectors to the development goals and needs identified for the region under analysis. Following a decision to proceed with a project, program or policy option, options assessment is continued with a focus to determine its precise setting, lay out, implementation features and programme, operational characteristics in the case of projects, and management of remaining environmental, health and social adverse impacts.

### Issues

Some of the crucial issues involved in the consideration of this session theme, while bearing in mind their close interconnection with those addressed in the others sessions, are the following: determination of development needs; uncertainty in the projection of demands; factors affecting societal choices and their influence in determining preferred options; obstacles preventing the more widespread adoption and use of options; incorporation of improved livelihood opportunities, local food security and the needs of those currently not served in both urban and rural areas into options identification; establishment of thresholds for what is acceptable and what is not, when considering long-term priorities, in terms of social, technical and economic feasibility; the scope of options assessment required in the different planning levels; consistency, integration and feed back of needs and options assessments between planning levels and scope of analysis without compromising overall development objectives; interrelation between the planning horizons at the various planning levels and scopes; accountancy for the long lead time of projects and short term needs; participation and involvement of stakeholders; alternative planning approaches; use of an screening criterion early upstream in the planning process; ensuring that criteria agreed at an upstream level/stage are incorporated into further decision-making process through in latter stages; dealing with immediate and short-term needs, etc..

### Specific topics proposed for discussion in this Session 1

- Characterisation of planning levels e.g. policy formulation, strategy and master planning sector planning, project planning
- Scope of needs and options assessment analysis required for each planning level.
- Links and relationships among different planning levels. (Consistency, integration and feedback)
- Time horizon: interrelation of the planning horizons of the various planning levels, accounting for the long lead time of some projects and short term needs

- 9.30 to 10.15      Presentation of case studies and/or papers
- **Case Study:** Options Assessment for Large Dam Projects at Policy Levels, Dr Rona Wilkinson, (ITDG)
  - **Case Study:** Strategic Environmental Assessment to support decision-making in hydropower generation expansion. Silvia H. Pires, Pedro M.C. Farah et al. (CEPEL- PPE/COPPE/UFRJ)
  - **Case Study:** Zambia: Power Sector Environment Assessment Scoping and Reconnaissance Study and Power Rehabilitation Project. Donal O’Leary (WB)
- 10.10 to 11.00      Plenary discussion  
The audience will discuss the specific topics proposed for this Session
- 11.00 to 11.30      **Coffee Break**
- 11.30 to 13.00      **Plenary Session 2: Identification of Options - Focus on process**

### Background:

Options consist of technological, policy and institutional responses, which may be categorised further based on whether they contribute to demand-side management (DSM), supply-side efficiency, alternative supply options including rehabilitation and upgrading of existing facilities and conventional supply options. The multi-functional nature of the hydro-ecological system; the types and importance of downstream uses of water; the on-site economic, social, environmental, health and cultural “costs” and “benefits” of the measures themselves will determine the attractiveness of different interventions.

The identification and validation of feasible options, which will then altogether be further submitted to joint integrated assessment, is a substantive component of the options assessment process. It faces challenges and constraints. There are factors affecting societal choices, like natural resource endowments, technological capability, institutional capacity, finance, market conditions, cultural preferences, awareness and education. And there are also obstacles preventing the more widespread adoption and use of certain options: market, policy, institutional, intellectual and regulatory barriers; capacity and resource constraints; the dominance of conventional approaches and interests in development planning; lack of awareness and experience with non-conventional alternatives; inadequate access to capital and a lack of openness in the planning system. There is a need to address these factors and obstacles to ensure that viable choices are not a priori excluded from the analysis, thus securing a comprehensive set of options for further assessment.

In order to overcome these challenges and constraints the institutional set up for decision making at the various planning levels plays a decisive role. In particular stakeholder involvement and public participation is essential at this stage to provide substantive grassroots approaches into the planning process ensuring that local perspectives be better accommodated.

### Issues:

Some of the crucial issues involved in the consideration of this session theme, while bearing in mind their close interconnection with those addressed in the other sessions, are related either to the factors and obstacles influencing the determination of preferred options as well as to the process of identification of feasible options. Regarding this process, some critical issues are the institutional set up, the participatory processes for different levels of planning; criteria for rejection at an early stage of options that are unlikely to meet avoidance and minimisation principles; overcoming lack of data of comparable detail for comparison of different options; stakeholder involvement and public participation; financing of the process; bounded timeframes- determining when a decision has been reached; etc.

### Specific topics proposed for discussion in this Session 2:

- Institutional set up for decision making process at various planning levels
- Stakeholder involvement and public participation in options identification
- Incorporation of grassroots approaches and local perspectives into the identification process
- Criteria for establishing thresholds of acceptability or rejection of certain options at an early stage

11.30 to 12.15 Presentation of case studies and/or papers

- **Case Study:** The Lower Orange River Management Study. Andrew Tanner (LORMG), Peter van Niekerk (DWAF), Peter Heyns (MAWR)
- **Case Study:** A study of a comprehensive solution to the problems of the Wloclawek dam and reservoir – anticipated social, economic and environmental effects. Ute Collier (WWF), Jacek Engel (WWF Poland)
- **Case Study:** Options Assessment for The Nam Theun 2 Hydro Project In Laos. Engelbertus Oud (Lahmeyer International GmbH)

12.15 to 13.00 Plenary discussion  
The audience will discuss the specific topics proposed for this Session

13.00 to 14.00 **Lunch**

14.00 to 15.30 **Plenary Session 3: Assessment Tools**

**Background:**

Options assessment is a component of planning approaches that assess all policy, institutional, management, and technical options before the decision is made to proceed with any set of programmes or projects. Consequently the assessment should be based on the respective merits of available options in the given context and involves full integration of social and environmental criteria into the set of technical, financial, and economic criteria.

A number of tools and criteria are already in place to facilitate such integration into the assessment process.

Some of them, described by WCD, are:

- Valuation of Social and Environmental Impacts
- Strategic Impact Assessment
- Cost Benefit Analysis
- Multicriteria Analysis
- Life Cycle Assessment
- Distributional analysis
- Risk analysis

**Issues:**

Experience in the use of the use of these tools, independently or jointly, is mostly limited to project level analysis. Limitations in the assessment of monetary values for social and environmental impacts challenge the reliability of CBA. The use of appropriate indicators, the relative weighting of environmental and social aspects and the methods for comparing, screening and ranking multi-criteria options are focus of debate when using MCA. Assessment of cumulative potential impacts in developing multiple projects, consideration of benefit sharing mechanisms and distributional analysis and incorporation of risks into the assessment of different options are some of the influential aspects to be accounted for. All these issues condition the ability of the various tool to contribute to the decision making process in terms of time, cost, flexibility, reliability and applicability to the various planning levels, particularly when information may not be equally available on various options under consideration.

**Specific topics proposed for discussion in this Session 3:**

- Assessment tools and planning levels. Criteria for selection
- Assessment of monetary values and subjective assessment techniques for environmental and social impacts
- Incorporation of risk analysis, considering data reliability, demand forecast, climate change, financial conditions and operational capacity uncertainties among others
- Incorporation of benefit-sharing mechanisms, integrated distribution, and cumulative impacts analysis

14.00 to 14.45 Presentation of case studies and/or papers

- **Case study:** National Hydropower Plan (NHP) Study, Vietnam, Stage1. A new Approach to Sustainable Hydropower Development. Vu Duc Thin (NHPS), Göran Lifwenborg (SWECO)
- **Case study:** The Environmental Manual for Power Development (EM): A Tool for Comprehensive Options Assessment in the Energy Sector. Uwe Fritsche (Oeko-Institut), T. Imon Herberg (GTZ), Frauke Neumann-Silkow (GTZ)

- 14.45 to 15.30    **Plenary discussion**  
The audience will discuss the specific topics proposed for this Session
- 15.30 to 16.00    **Coffee Break**
- 16.00 to 18.00    **Plenary Session 4: Process Implementation**

#### **Background**

One major drawback when addressing the issue of implementing comprehensive options assessment analysis is the lack of generalized experiences in the field. Most option assessment exercises available in the literature are associated to project level optimisation, limited to specific sectors - i.e., electricity generation-, or involved generic strategic desktop studies (life cycle analysis). Therefore, if it is agreed that, being a strategic priority, comprehensive option assessments should be incorporated early and upstream in the water resources planning process, every effort should be made to configure an enabling environment for its implementation in terms of political will, capacity building, stakeholders support, data collection and fund allocation.

Until these conditions are achieved, there will be a need to establish proper conditions to keep transparent, objective and participatory on-going decision processes to address short term needs without compromising long term and sustainable development objectives.

#### **Role of Government and private sector**

It is agreed that country government authorities are foremost responsible for initiating and conducting these processes. The principal considerations concerning government roles are related to the transparency and openness of the options assessment, and how planning and decision-making processes are conducted. Addressing the government role brings up the question of the role that the private sector should play in strategic and project planning levels and all phases of options assessment.

#### **Stakeholder participation and involvement**

Effective participation depends on appropriate processes. The lay out of these processes, forms of participation, and configuration of stakeholder representation, may differ according to the level and scope of the assessment, but should keep its fundamental substance and be clearly defined. The establishment of proper institutional structures for public participation in the decision making process is therefore very important. Stakeholder representation may be different between the pre-investment strategic planning phase, and the investment oriented project-specific phase. The former may encompass national or regionally relevant groups, while the latter aims primarily to involve community groups, project-affected populations and interests.

The way participation was implemented and achieved in past dam experiences has been the subject of intense criticism. Some of the complaints are related to insufficient time, resources and information made available for public consultations; narrow spectrum of participants, often ignoring rural communities, indigenous groups and affected communities and impairment of a multi-disciplinary approach due to the limited capacity of the government or development agency, usually constrained to engineering aspects.

Stakeholder involvement is highly dependent on communication and consultation aspects and how messages are communicated and viewpoints exchanged in order to inform and raise awareness, solicit stakeholder inputs and address their concerns. Providing information in a pragmatic and timely manner to stakeholder groups is therefore crucial to consider their response. This involves the establishment of institutional and capacity building measures to develop communication capacity with and among stakeholders, supervise and evaluate the consultation and communication process and ensure that decision-makers are kept updated and factored in results of stakeholder communication and consultations throughout the options assessment process.

#### **Information base**

Strategic analysis demands an extensive amount of information on current situation and historical trends of a large number of representative indicators and sound projection of the driving forces that will lead to future scenarios based on which the development goals will be adopted and needs determined. Scope, extensiveness and detail of information needed for

identification and assessment of options pose even larger challenges in terms of information requirements, according to the level and scope of analysis. In particular, the existence of social and ecosystem baseline studies at an early stage to describe existing conditions and resource endowment is fundamental.

Coverage, reliability, availability, amplitude, scope, range of fields/disciplines, compatibility, consistency, degree of geographical desegregation, accuracy to represent the regional or local context, are some of the many attributes that data should be satisfied to carry out meaningful identification of options and employ the various assessment tools mentioned above. Aspects like data quality control, organization of databases, uses of geographical information systems, decision support systems, etc., are also relevant.

#### **Duration, costs and financing**

Information requirements and the significant length of time needed to carry out detailed strategic needs and options assessments are usually non-compatible with political decision-making time frameworks and the urgency of addressing pressing needs. Associated costs, their financing and the complexity of the process, which renders its results rather uncertain, are also matters of concern that altogether contribute to the reluctance of governments and international financing agencies to support this activities.

In most cases these constraints have to do with the lack of stable strategic planning practices institutionalized at the governmental levels and the corresponding absence of information and data gathering systems of basic representative environmental, social, economic and technological indicators. Consideration should be given to create political awareness and will, establish appropriate policies, develop the corresponding institutional framework and build capacity at all levels to establish strategic planning and options assessment procedures as a standard practice. Investing in the capacity and process for options assessment and decision-making should be seen as an investment in a long-term strategy of lowering the costs of future planning processes and projects.

#### **Issues:**

Crucial issues concerning this session relate to decisive obstacles and triggering factors for embarking governments and societies on a comprehensive options assessment process. Why is it that proper options assessments do not take place? Obstacles are usually associated with financial, institutional and technological aspects. Corruption and vested interests also play their role. Presumptions that cost and time bounded processes resulting in definite decisions are most difficult to achieve also are a negative factor.

Therefore, the main questions on this important subject address which criteria should guide the structure and organisation of unbiased decision-making processes; what steps and critical decision points might be identified for the process; how to ensure appropriate stakeholder participation and involvement in the process, either regarding the level of the assessment, the identification and representation of stakeholders or information disclosure and transparency. Concerns about how to deal with time and costs of preparation, implementation of the process and achievement of results; with financing the various levels/stages of analysis; with requirements and constraints of knowledge, assessing tools and information are also relevant. Finally, the issue of institutional and capacity building, i.e., how to move forward with the assessment while improving the enabling environment, is not the least important.

#### **Specific topics proposed for discussion in this Session 4:**

- Obstacles for embarking governments and society on comprehensive options assessment (institutional, financial, technological, data constraints, others)
- Financing
- Triggering factors. How to deal with short-term needs?
- Stakeholder participation, involvement and responsibilities along the process
- Institutional and capacity building: How to move forward with the assessment while improving the enabling environment

- 16.00 to 17.00 Presentation of case studies and/or papers
- **Case study:** “China: Loess Plateau Watershed Rehabilitation Project (Loess I And II)”. Larry Haas (WB)
  - **Invited Paper:** Development Through Self - Reliance, Reviving Hope And Prosperity through Traditional Water Harvesting Systems” Alternative to Big Dams. Ambuj Kishore (Tarun Bharat Sangh).
  - **Special Presentation:** Sourcebook on Stakeholder Involvement in Options Assessments for Meeting Water and Energy Needs. Kees Blok, Larry Haas and Richard Davis.

17.00 to 18.00 Plenary discussion  
The audience will discuss the specific topics proposed for this Session

19.00 **Dinner**

### **Tuesday, September 23 2003**

Introductory remarks:

- Participants will be asked to break in four Working Groups (WG) reflecting the themes of the Plenary Sessions, as follows:
  - Working Group 1: Planning levels and scope of analysis
  - Working Group 2: Identification of options: focus on process
  - Working Group 3: Assessment tools
  - Working Group 4: Process implementation
- Drawing of preliminary conclusions and interaction among all Working Groups after half day deliberations will provide participants with a better insight of the general sense of the meeting and help focusing WGs discussions and final elaboration on the substantial issues within the corresponding WGs topics
- Guidelines to facilitate and organise WGs discussion will be provided to the participants.

8.30 to 10.30 Working Groups 1 to 4 Parallel Sessions - Framing the discussion

10.30 to 10.45 **Coffee Break**

10.45 to 12.15 Working Groups 1 to 4 Parallel Sessions – Towards preliminary WG conclusions

12.30 to 13.00 Plenary Session 5: Feed back on WG Preliminary Conclusions and interaction between groups

13.00 to 14.00 **Lunch**

14.00 to 16.00 Working Groups 1 to 4 Parallel Sessions – Building on feedback and interaction

16.00 to 16.30 **Coffee Break**

16.30 to 18.00 Working Groups 1 to 4 Parallel Sessions – Towards final WG conclusions

18.00 to 18.30 Plenary Session 6: Presentation of WG Final Conclusions

**Wednesday September 24 2003**

9.00 to 10.30 Plenary Session 6: Discussion of consolidated recommendations

10.30 to 11.00 **Coffee Break**

11.00 to 12.00 Final Plenary Session: What's next

12.30 to 12.30 Closing Remarks

## ANNEX 2:

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## ANNEX 3:

### CASE STUDIES PRESENTED

#### Plenary Session 1: Planning Levels and Scope of Analysis

**Presenters:** Alison Doig, Public Affairs Officer, Intermediate Technology Development Group; Pedro Farah and Francisco Eduardo Mendes, Laboratorio Interdisciplinar de Meio Ambiente/Universidade Federal do Rio de Janeiro; and Donal O’Leary, Senior Power Engineer, Africa Region Energy Section, World Bank

#### Options Assessment for Large Dam Projects at Policy Levels

Dr. Doig was the first speaker. She explained that she was not really involved in dams and that ITDG’s job was to get energy services to people who need them. She said that 1.6 billion people, nearly one third of the human population, do not have electricity. She explained that she intended to make a case for performing options assessments at the national policy level and for linking options assessment to poverty reduction. She said she was going to use two case studies as examples – one in Nepal where options assessment made a difference and one in Mozambique where options assessment could have made a difference and produced a better outcome.

The purpose of comprehensive options assessment at the policy level is to develop national infrastructure plans to local plans that meet local needs. Too often, electricity generation and transmission are planned at the national level without considering how the energy will be delivered to local communities. For example, the New Partnership for Africa’s Development includes national level plans for huge, power generation facilities and transmission lines to interconnect the continent, but when Dr. Doig asked project planners how the millions of sub-Saharan Africans who lack access to electricity will be served she received no answer.

Millennium Development Goals (halving poverty, reducing hunger, universal education, gender equality, reducing mortality and improving health, environmental sustainability, and access to clean water) cannot be met without energy. The principle tools for meeting these goals are country Poverty Reduction Strategy Papers that are the responsibility of national governments. Thus, in order to ensure that national policies are responsive to local needs, options that meet those needs must be incorporated into the PRSPs. She then described the case studies.



Nepal was planning to build Arun III, a large hydropower project. This one project would take ten years to construct, and would therefore not add to the country’s power supplies for at least a decade. Arun III would also absorb the vast majority of Nepal’s development funds. Because Arun III was an international project, expertise to build the dam would be brought in from outside the country, thus stifling the local hydropower industry. The decision to cancel Arun III and instead build a series of smaller dams using local labor was taken in 1995. The smaller dams increased job opportunities for Nepalese engineers and builders and brought electricity to communities much earlier than Arun III would have. Today, multiple projects ranging in size from 183 kilowatts to 144 megawatts are on line or under construction in Nepal.

Mozambique is a country with huge hydropower potential. It is also a very poor country with a highly dispersed population. Only seven percent of the population has a connection to an electricity grid. Where grid connections exist, only one-fourth of the population can afford to connect to them. In rural areas, only one percent of the population has a grid connection. Mozambique is planning to construct a transmission grid, costing US\$2 billion, to carry

electricity generated at a hydropower dam into the region. The grid will facilitate a massive flow of electricity into the region, but the distribution of electricity has not been planned for and the costs of distribution are not included in the US\$2 billion price of the project.

Dr. Doig said that a report is about to go to the World Bank suggesting that decentralized options such as diesel generators and renewables are more cost-effective and affordable to the local community. Such options would generate a smaller amount of power but, in combination with other infrastructure investments, such options could raise the income level of the communities to the point where they could eventually afford to be connected to a grid. If a national level options assessment had been performed, the outcome probably would have been different from the decision to build an enormous grid and the US\$2 billion could have been used to supply local energy needs. As it is, large hydropower plants are not going to meet national poverty reduction goals.

Conducting options assessments at the national policy level does not require starting from a blank slate, as tools that can be used to do this work already exist. One such tool is called "Sustainable Livelihoods Framework." This tool provides a holistic and dynamic approach that links national policy to impact on communities. The Sustainable Livelihoods Framework can be used to compare the likely social, environmental, capacity-building and economic impacts of different interventions.

Dr. Doig concluded by saying that there are very few examples of options assessments taking place at the national policy level. She suggested that the next step is to look at where national level options assessments are being done and examine how they might be done more frequently.

### **Decision-making in the Hydropower Generation Expansion**

Pedro Farah and Francisco Eduardo Mendes presented the next paper, which was about options assessment in Brazil. Mr. Mendes explained that they were researchers looking at multi-stakeholder processes and were trying to introduce some concepts from the convention on biodiversity and the WCD process into hydropower planning. The work they were presenting involved a variety of stakeholders, including the Ministry of Environment and the Ministry of Mines and Energy. He pointed out that Brazil is a very large country with many major river basins.

The paper was divided into three sections. The first was a case study of inventories of potential projects at the regional level, with basin integration. The second was a case study of the Decennial plan for energy and the third was a small study on Strategic Environmental Assessment for integration of basins in Brazil.

Mr. Farah presented the remainder of the paper. He pointed out that the institutions involved in the options assessment process were not necessarily thinking about the process in the same way that he and Mr. Mendes were.

At the basin level, decision makers can determine where in the basin a project will be built. Local and regional conditions must be considered, as must the synergistic and cumulative environmental impacts of a group of projects. At first, decisions on hydropower projects were made only taking economic and energetic efficiency into account, and the results of the screening process were unsatisfactory. Thus, social and environmental criteria were added to the screening procedure. The target of the economic and energetic efficiency evaluation is to identify the projects with the smallest cost/benefit ratio. The target of the social and environmental impact analysis is to identify the projects with the minimum impact index.

During early screening processes, the study team noticed that the social and environmental impact index did not vary much between alternatives and they concluded that the indicators they had selected were not sufficiently sensitive. To increase variation in the impact index, the indicators would have to be improved.

The second level of analysis was national and involves evaluating alternatives for expanding energy supply. The purpose was to determine where and when projects would be executed. At this level, all dams regardless of the stage of study or implementation, were evaluated. This meant comparing dams that were at the inventory,



feasibility or basic design stages with dams that were already operating or under construction. In addition, dams may have been evaluated at different planning levels; that is, the evaluation could have been done at the local, river basin, regional or national level. Thus, the dams already in the pipeline in Brazil have been assessed with different levels of method application.

In the Decennial planning process, dams were re-assessed at three different levels: as individual projects, as groups of projects, and as components of the plan as a whole. The reassessments at all levels included Social and Environmental Complexity Analyses and analysis of institutional procedures. Re-assessments for projects and groups of projects also included an evaluation of alternatives. Mr. Mendes intervened at this point to express that the social and environmental impact assessment can lead to some projects being eliminated from further consideration.

The third level of analysis was regional, like the first or screening level, but involved all sectors. This was the level in which Strategic Environmental Assessments could be applied as a tool for integrated, environmental river basin management. This level of assessment examined cumulative impacts of proposed projects considering the plans, projects, policies and programs of all sectors and the identification of critical, environmental components. In the Araguaia/Tocantins river basin, the application of a cross-sectoral analysis substantially changed the priority rankings of the projects that had been screened at the first level of assessment.

### **Zambia: Power Sector Environment Assessment Scoping and Reconnaissance Study and Power Rehabilitation Project**

The final presentation in this session was by Donal O'Leary who works in the Energy Unit of the World Bank's Africa region. His unit considers every energy option from biomass to petrol. He mentioned that he had also worked in Asia and had been involved with Mr. Pandey and others in the Arun III debate and that it would be interesting to get a retrospective from other workshop participants who had been involved. He said that the most important lesson he had learned through the years is that a multi-stakeholder approach is absolutely critical in decision-making on large infrastructure projects, and that not only new projects but also existing projects should be examined.

The case presented by Mr. O'Leary was on the Zambezi River in Zambia. Prior to the 1990s, there had been virtually no major investment in Zambia's power sector for 25 years and the power supply and



distribution systems were deteriorating. In the meantime, 40 percent of Zambia's population lived in urban and peri-urban areas poorly served by the power grid. The copper industry accounted for 80 percent of Zambia's export earnings and close to 65 percent of the country's total electricity consumption.

Large hydropower plants generate most existing grid supply in Zambia. These include the Kariba Dam, which has two power houses, and the Karabasa Dam upstream from the Kariba, whose reservoir inundated the villages of the Gwembe Tonga people in the late 1950s. Downstream, near the city of Livingstone, there is a hydropower dam at Victoria Falls, which is a UNESCO World Heritage Site. Further, the Kafue Dam lies on the Kafue River, a tributary to the Zambezi. Another dam called Kezi Kezi was constructed upstream of the Kafue Dam to regulated river flows into Kafue.

The establishment of a new, democratic government in the early 1990s catalyzed rapid economic growth. This economic expansion triggered a sharp increase in energy demand and poor power supply was assessed as key impediment to Zambia's investment and economic program. Meanwhile, the country adopted a new energy policy framework in the mid-1990s, when the Energy Act became law in 1994, followed by the Electricity Act in 1996. There was a parallel policy reform in social sectors, including environment and land and water resources management policies and in regulatory agencies. In the

basin context, the Zambezi River Basin Authority was established and many donors were becoming active. This positive policy environment provided an opportunity to look not only at new infrastructure but also at how such infrastructure fits into the overall strategy for development of the energy sector and how the energy sector links with environment and social sectors. For these reasons, Zambia decided to conduct a strategic, sector-level environmental scoping and reconnaissance study.

This study was undertaken early in the process of rehabilitating the supply-side energy sector and introduced the notion of a “package” of technical efficiency, social rehabilitation, environment restoration, and dam safety measures to improve the overall development performance of existing infrastructure. The goals of the process were to modernize the power supply system and improve the system’s reliability and service levels; improve sectoral performance through regulation and increased private-sector involvement, improve the institutional performance and environmental management of ZESCO, the national power utility; and institute a rehabilitation and development program for the Gwembe-Tonga people.

The World Bank worked with WCD Commissioner Thayer (Ted) Scudder to define the scope of the study. It was decided that a sector-wide environmental assessment would be undertaken to rehabilitate existing infrastructure, taking into consideration the environmental and social components of physical works, and to implement institutional measures to improve management and cross-sector integration. For the feasibility study, the World Bank contracted with the Institute for Economic and Social Research (INESOR) at the University of Zambia to assess the needs of people in the project areas and further define the scope of the project.

Project preparation studies were undertaken from 1996 through 1998. These examined mostly non-controversial issues, such as options for electricity generation, transmission and distribution. At the same time, the World Bank, working through INESOR, launched full stakeholder processes for evaluating and choosing within-project alternatives for projects having more complex environment and social aspects. These processes comprised the Victoria Falls Rehabilitation project and a project for rehabilitation and development of the Gwembe-Tonga people.

While most of the project components are completed, there are ongoing project-level alternatives assessments informing implementation and management decisions.

These include economically distinct sub-projects evaluated using standard procedures, power stations (Kariba North Bank, Kafue Gorge and Victoria Falls), the main interconnected transmission system, and distribution networks (Lusaka and Ndola and Kitwe – two townships in the Copperbelt). They also include initiatives to improve capacities for environmental and social management, such as the Gwembe-Tonga Rehabilitation and Development Program; sub-basin environmental and social baseline evaluations of major watersheds where existing and proposed dams were located; and capacity development in the new Environment and Social Affairs Unit of the country’s largest utility, Zesco. Duplication of other sector initiatives, such as the demand-side management program and the rural/urban electrification program, was avoided.

Even though most of the work was done before the WCD process was underway, it did reflect many of the WCD core values. Lessons learned relevant to planning levels and scopes of analysis include the following. One is that sectoral environmental assessment is an effective instrument for expanding scope and criteria to identify, assess and prioritize options that respond to different development needs in this case, specifying reconnaissance level terms of reference. Another lesson is that rehabilitation options should be considered as a “package” of measures to improve technical, environment and social performance. Further, integration between planning levels starts at the policy level and continues at sector levels (embodied in the selection of projects) and at project-levels (design, development, implementation and operation). It is important that improvements in existing power projects should be considered as part of the options portfolio, particularly if there has been under-investment, because such improvements can yield high rates of return. It is also important that early multi-stakeholder input and review of sector environmental assessments or other intermediate sector plans are relatively low- cost, effective means for establishing partnerships for project-level activities. Finally, any options for water resource management and service provision options have long lead times. Consequently, it is essential that sector planning and options assessments exercises identify projects for implementation in the short term and advance project-level study of options with longer lead times.

The most critical lesson of all was that, when the study team decided to evaluate what the best options were, this was also the time to do the sectoral environmental analysis and to get people involved in the options assessment process.

## Plenary Session 2: Identification of Options - Focus on Process

**Presenters:** Andrew Tanner, Director of Water and Environment, Ninham Shand Ltd. and Ute Collier, Dams Initiative Leader, World Wide Fund for Nature (WWF) Living Waters Program

### **The Lower Orange River Management: Water Resource Management Challenges and the Methodology for Identification and Selection of Management and Development Options**

The first speaker was Andrew Tanner. Mr. Tanner made a presentation on the Lower Orange River Management Study, which was launched in April 1999 when Namibia and South Africa signed a ministerial agreement to conduct the study.

The Orange River is shared by four countries: South Africa, Botswana, Namibia and Lesotho and forms the boundary between South Africa and Namibia. The river's headwaters are in South Africa, upstream of the Vaal Dam, and in the Lesotho highlands. The Vaal River contributes 35 percent of the Orange River's mean annual flow, which is about 11,000 million cubic meters per year and Lesotho contributes another 35 percent. By the time these tributaries reach their confluence, the Orange River has already received 92 percent of its total flow. Runoff from Botswana constitutes a relatively minor portion of the Orange River's flow. The basin is hot and arid, with large expanses of barren soil.

Cultivation of high value crops such as dates and table grapes, diamond mining and ecotourism provide the main opportunities for economic growth in the basin. Both mining and agriculture require large quantities of water. At present, water use in the Orange river system is 5,000 million cubic meters per year, just under half of the river's total flow. This figure is expected to grow by 1,000 million cubic meters.

The economic and social goals of the Lower Orange River Management Study are regional economic development, poverty alleviation, job creation, food security, ensuring water supply to Namibian users, compliance with South African and Namibian national objectives, and the development of strategies for water resources management. The water resource objectives are to ensure accessibility of adequate supplies, to provide water for environmental and consumptive use, and to increase the quantity of water of acceptable quality in the lower Orange River. These issues are particularly sensitive for Namibia, which is at the downstream end of the river and considerably less developed than South Africa.



The institutional context in which the study is being conducted includes a bi-national Lesotho Highlands water commission and a new national water act and water resources strategy in South Africa. In addition, South Africa is now developing strategic water resource management plans for four water management areas in South Africa, and the Orange-Senqu River Commission (ORASECOM), established in 2000, will also be developing integrated water resource management plans. These two processes are running concurrently and sharing information with the Lower Orange River study. As a result, there is a complex combination and interaction of government actors in the Orange River basin.

Because the Orange River had been the subject of previous studies, including one launched by South Africa in 1960, one performed jointly by Lesotho and South Africa starting in 1983, and an Orange River restudy initiated by South Africa with public consultation, quite a bit of data was available to support the Lower Orange River Management Study.

The study is looking at options for increasing water availability at two levels. The first level examines options on the basin scale and the second looks at the details of a particular option and where it might be implemented. The options assessment process starts with a comparison of options to defined criteria, which include regional economic and social objectives, benefits and beneficiaries of water, environmental water requirements, river and estuary requirements and legal and management requirements, the yield versus the cost of options, water quality, direct environmental and social benefits and impacts, the program for implementation and risks to implementation or effectiveness.

Appropriate options will be discussed at a workshop that involves key stakeholders. Then, the study team will

produce a set of recommendations of development scenarios and group competing options together. After further opportunities for the involvement of authorities and the public, the study team will issue recommendations for and definitions of more detailed studies of options.

Promising management options that have been identified include limiting new water allocations; increasing water conservation and demand side management programs for mining, irrigation and urban and industrial uses; and reallocation and/or reduction of existing water rights. The greatest potential for water conservation is in the irrigation sector, particularly upstream of the Vaal confluence where there is significant water use. There are also opportunities for changing operations at existing structures and for building new structures. The project has not yet assessed these options.

Barriers to implementation of the study include the following. First, 95 percent of the water in the river originates upstream of the common border. Second, there is no agreement between South Africa and Namibia regarding how the river water will be shared, and such allocations are not part of the current study. Third, the economic imperative in Namibia has a higher political profile than in South Africa. Other issues the study faces include ensuring the availability of water from water conservation and demand-side management programs to environment and other users, the acceptability of reducing existing allocations, uncertainties over the timing of effects of water conservation and demand-side management, and the fact that a legal framework is in place but has not yet been implemented on a large scale in the agricultural sector.

Lessons learned include that there is a list of prerequisites for developing management strategies for international rivers, which includes agreed, detailed, regional development objectives, agreed principles and methodologies to determine environmental water requirements, and existing national structures for consultative national and regional planning. Further, implementation of new approaches needs strong, co-operative governance. Finally, there are very significant time and financial requirements for even limited authority and public consultation in multi-national, integrated water resources management, basin-wide studies.



### **A Study of a Comprehensive Solution to the Problems of the Wloclawek Dam and Reservoir: Anticipated Social, Economic and Environmental Effects**

Ute Collier gave the second presentation on the Wloclawek Dam on Poland's Vistula River. Dr. Collier explained that her job is international, that she's not an expert on Poland, and that she was making the presentation because the project leader, Jacek Engle from WWF-Poland, was unable to attend the workshop.

The Wloclawek work was very much a project-level options assessment. The need addressed by the study was ensuring the safety of the Wloclawek Dam, which was trapping river sediment and releasing sediment-hungry water, resulting in erosion below the dam that threatened the structure's stability. WWF initiated the work when the Polish government decided to build a second dam, the Nieszawa Dam, to raise water levels and accrete sediment below Wloclawek and halt the erosion of the Vistula's bed.

Of course, the erosion would then be transferred to below the Nieszawa dam. Also, because the reservoir freezes over in the winter, the Wloclawek Dam has been blamed for causing severe ice-jam floods. In 1981, for example, ice jams on the Vistula lead to a huge flood, the damages from which were equal to half the investment cost of the dam in 1970. Construction of the Nieszawa Dam could exacerbate the problem of ice-jam floods.

Energy was not at issue in the decision to build a second dam. Energy demand in Poland is not growing, since the country's industrial production plummeted during the 1990s. There is also a huge potential for increasing energy conservation and efficiency in Poland. While both the Wloclawek and the proposed Nieszawa dams contain small generating facilities, Wloclawek, which was built in 1970, only has 62 megawatts of installed capacity and produces about 0.5 percent of Poland's electricity.

With Warsaw and Krakow on her banks, the Vistula is the most important river in Poland. At 1,047 km, it is the largest river in the Baltic Basin and drains 56 percent of Poland's area. The river is also important for biodiversity as it provides habitat for 76 percent of Poland's breeding birds.

So far, only one dam obstructs the Vistula's lower and middle course and, unlike most of the rivers in Europe, the river maintains natural features important for biodiversity support, such as gravel bars and meanders.

The impacts of Nieszawa Dam, which would be built 30 kilometers downstream of Wloclawek, would include the loss of 30 kilometers of natural river bed, the destruction of habitats of rare and threatened species of birds – including eight species that are listed in the EU Bird Directive, and the exclusion of 25 square kilometers of the river from the Natura 2000 Site in the lower Vistula valley.

Although required by Polish law, and by the European Union, which Poland aspires to join in 2004, the government did not conduct an environmental assessment on the Nieszawa Dam. The government was also non-responsive to the concerns of WWF and others regarding the necessity and wisdom of building a second dam. WWF decided to perform an options assessment to get a sense of what the alternatives to the dam might be and to use as a lobbying tool to try to stop Nieszawa's construction. WWF decided to include Nieszawa in the options assessment to ensure a balanced consideration of all the options. A team of experts, including academics from Polish universities, and international experts such as former WCD secretariat member, Larry Haas, carried out the assessment. The government declined to be involved.

Study objectives included comprehensive assessment of Wloclawek Dam with an assessment of environmental changes and an economic analysis, assessment of problems caused by the dam; stakeholder and community meetings; options identification; a social and environmental assessment of defined options including environmental effects, socio-economic effects, and economic analysis; multi-criteria options assessment; and a set of recommendations.

Initially seven options were considered, but three were eliminated because they were not technically feasible. The options assessed in depth included do nothing, build a new dam in Nieszawa along with supplementary works at Wloclawek Dam, full modernisation of the Wloclawek dam, and decommissioning the Wloclawek dam. Of these, the decommissioning of Wloclawek



Dam and restoration of Vistula into a free-flowing river had the highest score under both, the socio-economic and environmental groups of criteria as well as the lowest public cost. Building Nieszawa would cost 346 million euros, modernization of Wloclawek would cost 83 million euros, and decommissioning would cost only 48 million euros.

Lessons learned were both positive and negative. On the positive side, the involvement of a multidisciplinary team of experts was useful in considering the full range of economic, social and environmental issues involved in the assessment. The engagement of high profile reviewers gave credibility to the study. It was important to have all options on the table, including a new dam or series of dams for balance. The economic and socio-economic analysis were useful in comparing options, and the assessment was a useful lobbying tool.

On the negative side, the timing of the study was sub-optimal, because even though the Polish parliament had not yet appropriated money for the Nieszawa project, the government had already taken a decision to build the dam. Because the work was performed by an environmental NGO, the study was immediately perceived as biased and slapped with a green label. Ideally, options assessments should be conducted by the government with participation by industry, NGOs and local people. There were problems with the valuation of ecosystem services in monetary terms. There also should have been more involvement from dam proponents, local people and other NGOs.

### Plenary Session 3: Assessment Tools

**Presenters:** Goran Lifwenborg, Regional Manager Asia, SWECO International; Uwe R. Fritsche, Coordinator of the Energy and Climate Division, Oeko-Intitut; and Andrew Scanlon, Deputy Chair of the Environment Committee, International Hydropower Association

#### **National Hydropower Plan Study Project, Vietnam Stage 1: A New Approach to Sustainable Hydropower Development**

Goran Lifwenborg began his presentation on the Vietnam National Hydropower Plan study by giving the overall objectives of the study, which were to assess and rank selected hydropower projects from the following two perspectives. The first perspective would entail an integrated cross-sectional approach, in the form of a ranking study, with the objective to develop the available water resources in a basin in a multi-purpose (inclusive of hydropower, flood control, irrigation and water supply) and from an environmentally and socially sustainable perspective. Using this approach, hydropower projects are viewed in a basin perspective rather than as isolated projects. The study would also deliver a national hydropower development plan specifying a sequential development plan for the selected hydropower projects to meet the power demand under various scenarios.

The study proceeded in four phases: coarse screening, fieldwork and primary data collection, ranking studies, and the National Hydropower Development Plan. The first two phases included the identification of 47 potential hydropower projects in Vietnam's five main

river basins. Then, the study team conducted an integrated coarse screening of projects based on available data on hydropower, water resources, environmental and social issues. As a result of the coarse screening, 22 projects were selected for further study. These projects were the focus of fieldwork and additional data gathering at province, district and commune levels, including environmental and social aspects.

The ranking studies were based on two, non-comparable parameters: a technical/economic preference index and an environmental/social preference index that considered negative impacts after mitigation and beneficial impacts. These indices were relative in that, rather than assigning absolute values to each parameter, they compared projects with each other.

The technical/economic preference index was based on the projects' benefit/cost ratios and included investment costs; environmental and social mitigation costs; energy benefits in comparison with thermal alternatives; benefits derived from other water uses such as irrigation and flood control, and restrictions due to other water uses such as irrigation and flood control, which could lower energy production. The project with the highest ratio of benefits to costs received a score of 100 under this index and the other projects were assigned relative values.

The environmental/social preference index was based on an assessment of 10 environmental and 15 social negative impact parameters, considered after mitigation measures are implemented. The negative



environmental impact parameters included the loss of agriculture land, degradation of water quality, erosion and sedimentation, declines in fish populations, reductions in forest productivity, loss of flora, loss of fauna, damages to aquatic life, impacts on protected areas and the potential for habitat fragmentation. The negative social impact parameters included the resettlement of people, host area relations, clashes related to ethnicity, water-related health concerns, water access, migration, fisheries, impacts to directly affected people, impacts to partially affected people, the history of ethnic groups, the need for extension services, changes in land use, reductions in farm output, disruption of secure access to food, and diminished water availability.

The study also examined six beneficial impact parameters for each project, including water quality, increased employment and income, enhanced access to markets, rural electrification, improvements in transport and improvements in education.

Scores derived from the environmental/social preference index were based on the product of magnitude (quantity) and importance (quality) for each parameter according to a five-degree scale: projects with very high impacts received a score of four, projects with high impacts received a score of three, projects with medium impacts received a score of two, projects with low impacts received a score of one, and projects with no impacts received a score of zero. The project with the lowest, total score for all of the 25 plus 6 parameters, receive an environmental/social impact score (ESPI) of 100. The other projects received relative values.

The study team attempted to add the technical/economic and environmental/social preference indices and asked the stakeholders to assign weights to the

indices. The stakeholders almost uniformly agreed that the technical/economic indices should receive 60 percent of the weight and the environmental/social indices should receive 40 percent.

Based on the ranking studies, the study team grouped the projects into nine categories. The first was Category A, projects with outstanding economic benefits, which included projects with a technical/economic index above 56 and a benefit/cost ratio above 1.2. The second was Category B, projects with considerable economic benefits, which included projects with a technical/economic index in the range of 47 to 56 and a benefit/cost ratio ranging from 1.0 to 1.2. The third was Category C, projects with doubtful economic benefits, which included projects with a technical/economic index below 47 and a benefit/cost ratio below 1.0. The fourth category was Category I, projects without complexity and with sustainable environmental/social features, which included projects with an environmental/social preference index above 60. The fifth category was Category II, projects with some complexity and unsustainable environmental/social features, which included projects with an environmental/social preference index between 30 and 60. The sixth category was Category III, projects with considerable complexity and with unsustainable environmental/social features, which included projects with an environmental/social preference index below 30. The results of the ranking studies are given in table 1.

Projects in categories AI and AII are considered highly recommendable, projects in category AIII are considered highly economic attractive but with considerable complex impacts; projects in categories BI and BII are of considerable interest, and projects in category BIII, CI, CII and CIII are of low or no interest.

Technical/Economic Category	Environmental/Social Category		
	I ESPI > 60	II ESPI 30 - 60	III ESPI < 30
A TEPI > 56 (B/C > 1.2)	Project A Project H	Project C Project L	Project P Project E
B TEPI 47-56 (B/C 1.0 - 1.2)	Project F Project K	Project J Project R	Project B Project Q
C TEPI < 47 (B/C < 1.0)	Project G Project O	Project N Project K	Project M Project D

**Table 1: Results of Ranking Studies**

Stakeholder participation in the study took place on three levels. First, there were stakeholder meetings in Hanoi for ministries, agencies, “National NGOs,” mass organisations and donors. Second, there were stakeholder workshops in three river basins with direct involvement of representatives of affected people at the province, district and commune levels, with the objective of discussing how to involve stakeholders in the future studies. Third, the study team performed field surveys at two affected villages for all selected projects. The results of the field surveys were included in the social impact studies in Phase II.

The lessons learned from the Vietnam hydropower study include the following. First, stakeholder participation is needed at an early stage of a hydropower project, but there is a risk that the “affected people” will perceive an early study as if the project will be implemented. This perception might hinder development in the area as people might decline to invest labor and resources in improving their living conditions because they believe that they will have to abandon these investments in the future. Second, project opponents should acknowledge the multipurpose aspects of hydropower projects to a higher degree. In Vietnam, regulated water for irrigation and flood control is often more important than power generation. Third, there is a need to study hydropower projects in a basin perspective, not as isolated projects. This will require more coordinated efforts between different ministries. Multi-stakeholder river basin organizations should be established to accomplish cross-sectoral communication.

### **Environmental Manual for Power Development: A Tool for Comprehensive Options Assessment in the Energy Sector**

The next presentation was by Uwe Fritsche on two tools for comprehensive options assessment in the energy sector: the Environmental Manual (EM) and the Global Emission Model of Integrated Systems (GEMIS). Mr. Fritsche explained that he coordinates the energy and climate division of the Institute for Applied Ecology. The institute is an independent, non-governmental, non-profit organization with 100 researchers. The EM/GEMIS project was carried out in cooperation with GTZ, the German development aid agency, and with other bilateral donors from the UK, Switzerland, the Netherlands and the US, as well as the World Bank.

He described the ongoing debate in Germany over the distributional aspects of sustainability. Because these aspects cannot be addressed scientifically, participation in decision-making is essential. Mr. Fritsche said that, in the early 1990s, bilateral donors felt that they had not sufficiently incorporated environmental aspects into



their funding decisions. Also, the World Bank wanted a comprehensive approach for analyzing options to apply in some 20 countries. The purpose of the EM/GEMIS project was to develop tools, apply them and learn what the problems associated with the tools are.

He asserted the importance of a needs assessment, but explained that needs were not assessed as part of the options assessment process his institute had designed. The first step in that process is a coarse screening in which options are broadly assessed and certain options are excluded from further study for explicitly stated reasons. Following the coarse screening, the study team chose a set of criteria for evaluating the performance of remaining options. He explained that computerized tools could assess only some of these criteria, such as greenhouse gas emissions, air borne pollutants, liquid effluents, wastes and land use costs. Other important criteria, such as resettlement, ecological changes, and cultural issues cannot be measured using these tools because they are site-dependent. The value of the EM/GEMIS approach is that it speeds up the analysis of some of the criteria, leaving decision-makers with more time to focus on the social and environmental aspects that cannot be programmed into computers. He pointed out that the selection of options is not a one-round cycle and that several rounds of assessment are usually necessary to come up with a stable solution.

To assess the options, the study team begins with a baseline scenario based on the assumption that no action is taken to address the identified needs – a business-as-usual scenario. Then, the performance of various options or, in the case of scenario development, various patterns of development is assessed against the baseline and against the criteria.

The EM/GEMIS tools incorporate a comprehensive, life-cycle analysis. For a hydropower station, for example, the tools assess the material required for construction, the costs of transport and a host of other aspects in

addition to the costs of building the project. A similar analysis is applied to all competing options so that the options assessment is as impartial as possible. This is important because the greatest social and environmental costs of some options, such as solar voltaic cells, are related to their manufacture.

The EM/GEMIS models for both thermal and electricity generation can assess heating and cooling demands and demand-side management as well as sectors other than energy, such as agricultural systems. Mr. Fritsche said that his institute is currently engaged in a project to integrate the energy, food and mineral needs of a society and to examine the interactions between these sectors.

He explained that the tools use a large database to analyze what the consequences of implementing various options would be, whether for an individual project or for a scenario stretching over a longer timeframe. The database contains 5,000 different templates adjusted to 20 different countries, because the costs and efficiencies of technologies will vary from country to country. It is updated every year, and new applications are added to it.

Mr. Fritsche pointed out that, from the perspectives of donors and researchers, transparency is an important feature of the tools. Users can see all the values assigned to various criteria, and test the sensitivity of different options to each criterion by changing these values. He identified the lack of ability to assess site-specific impacts of hydropower projects and the inability to examine social and ecological factors as limitations of these tools. The database is generic and provides basic information such as the costs involved in operating a wind turbine compared with a coal-fired plant or the costs and environmental performance of micro-hydropower schemes. The tools can also assess the trade-offs between costs and emissions, such as the costs involved in achieving a certain emission reduction target, the amount of emissions reduction that each option can achieve per unit of cost, or what the impact of a carbon dioxide tax or a Clean Development Mechanism would be given a certain value applied to each unit of carbon dioxide.

Mr. Fritsche said that another strength of these tools was that they are very easy to use. He said that students are able to use them after working with them for a week. The tool were developed for use by decision-makers in governments, utilities, NGOs, and multi- and bi-lateral banking systems.

He found that one interesting aspect of the application of the tool was that users had little interest in qualitative, subjective information. The model contained a feature

that assigned impact values to certain options, but this feature was not seriously used in any of the case studies. He explained that there is a danger in getting stuck on numeric values because many important criteria in options assessment cannot be quantified. Mr. Fritsche recommended that, rather than using EM/GEMIS to confine the assessment of options to quantitative criteria, decision-makers should use the tools to abbreviate the effort expended in assessing quantitative aspects and apply the time saved in doing so to involve stakeholders in an assessment of the qualitative aspects. The EM/GEMIS approach can also be used as a communications tool, to demonstrate that the process is open and transparent. To that extent, it also serves as a bridge for gaining a shared understanding of problems and opportunities.

### **International Hydropower Association Sustainability Guidelines**

The final speaker of this session was Andrew Scanlon, who presented the International Hydropower Association's sustainability guidelines. He explained that Hydro Quebec and Hydro Tasmania were involved in drafting these guidelines, which draw heavily on IHA's original environmental guidelines. The association had received both internal and external feedback on the sustainability guidelines.

Mr. Scanlon noted that governments have a role in setting objectives and priorities, and for delivering certainty for proponents of hydropower projects. The decision-making process should specify how to evaluate various options in terms of sustainability.

Criteria for assessing the alternative new and existing hydropower projects include issues such as dam safety, environmental management systems and compliance. There are sections of the guidelines that provide more information on economic, environmental and social sustainability. IHA was still taking comments on the document, which is a very early draft. Mr. Scanlon expressed his hope that IHA will adopt the guidelines at their upcoming annual meeting.

In addition to the sustainability guidelines, IHA is preparing guidance notes for the implementation of the guidelines at three levels. The first part of the guidance notes uses a rating system to evaluate alternative energy options. IHA would like help in refining this section. The second part provides for an evaluation of alternative hydropower schemes. The third part poses sustainability questions about existing hydropower projects. The guidance notes will contain a scoring system for ranking alternatives.

## Plenary Session 4: Process Implementation

**Presenters:** Larry Haas, consultant and former WCD staff; Shripad Dharmadhikary, Coordinator, Narmada Bachao Andolan; Alessandro Palmieri

### China Loess Plateau Watershed Rehabilitation Project



The first presenter was Larry Haas, who was to discuss China's Loess Plateau Watershed Rehabilitation Project.

Mr. Haas mentioned that Liu Zhiguang of the Chinese Ministry of Water Resources was present and, since the project he was presenting was implemented under the auspices of the ministry he invited Mr. Zhiguang to offer corrections or observations on his presentation. He also explained that he did not actually work on this project, but that he had worked on integrated water resources management techniques applied to the water and power sectors in a province just to the north of the Loess Plateau.

Mr. Haas commented that this case study really brings out the need to realize a balance between structural and non-structural interventions in the watershed in a total integrated water resources management context.

Loess soils are one of the most highly erosive soils in the world and subject to liquification. The Loess II project was a pilot study that looked at small catchments within

the entire watershed to assess what options could be developed in collaboration with beneficiaries and with the government services. This assessment would then pave the way for more widespread replication.

While the study area receives relatively little precipitation, only 20 to 55 centimeters each year, it experiences intense floods – 45 percent of the annual rainfall has been recorded in one event. The climate has tremendous implications for floods, loss of soils, and the attendant ecological effects such as declining water tables. The climate and decrease in water availability have led to the impoverishment of the 400 million people living on the plateau. Mr. Haas showed a slide of the plateau, which displayed the severe erosion as well as the extensive terraces that are needed in order to grow crops in the area.

The Loess Plateau drains into the Yellow River, carrying with it 1.6 billion tons of sediment each year. As a result, the mouth of the river is closed due to sedimentation for 165 days out of every year. During this period of time, there is no flow from the river into the estuary. Because of the river's high silt load and centuries of raising levees along the banks of the Yellow River to protect villages and farms from flooding, the bed of the river rises by an average of ten centimeters per year, or one meter every ten years. China has reached the limit of sustainable expansion and raising of these levees, which in some cases are quoted as being 1.7 meters high but many of which are 6 to ten meters above the surrounding area. Thus, there is an urgent need to find options, including combined strategies for the upper and lower reaches of the river basin, and for better management of the upper portions of the basin.

China's government has defined poverty alleviation as a major goal of its policy and planning activities; therefore the project was designed to improve people's livelihoods in the upper reaches of the basin and to help to reduce the scale of floods downstream.

Throughout the 1980s and early 1990s, government programs suffered from poor links between erosion control programmes and rural development initiatives, especially dry land agriculture and from low levels of local participation that were inadequate for addressing the scale of the challenges. Initial demonstrations of integrated programs seemed to offer an effective way to overcome these challenges, so the Loess I project was launched in 1994 on selected, small watersheds of nine tributaries to the Yellow River. The approach was to develop a portfolio of options tailored to circumstances

and to work with farming communities at all levels to test the effectiveness of various measures, to see what sort of financing terms were appropriate to spur participation in the project, and to coordinate government support for implementation.

A field evaluation of tailored options and portfolios was undertaken from 1996 through 1998 and, because of the success of Loess I, the decision was made to scale the project up. Loess II was launched in 1999, expanding the effort to 12 tributary watersheds in three provinces and Inner Mongolia. The options offered by the program included crop diversification, slope stabilization, planting and protection of vegetative cover and rainwater harvesting for irrigation, among other measures. Three types of dams, key dams for ephemeral rivers, warping dams on ephemeral gullies, and small check dams, were also included. The key dams capture sediment and thus accrete land. Later, the dam is abandoned and the new land is given to the farmers, who reclaim it for agriculture.

The Yellow River Conservancy Commission was the lead agency under the Chinese Ministry of Water Sources. The project benefited from a devolved structure, with Project Leading Groups (PLGs) and Project Management Offices (PMOs) at the central, provincial, prefecture, and county levels. Decisions were also made at different levels. Farm households chose on-farm initiatives from the portfolio tailored to each area, while choices of sediment control structures were made following consultations amongst groups at local, district, and provincial levels.

Devolved processes are common in China, but the Loess II was distinguished by the fact that the PMOs worked with the villagers through the village committees, a factor that really brought the process down to the grassroots level.

The project was over-subscribed by the number of districts because of information transfer mechanisms that were built into the process. The results to date show that, in the catchment areas, a combination of measures far exceeded the effectiveness of one strategy for sediment management alone. Farm incomes in the watershed rose appreciably. Loess I produced demonstrated, commercial viability of the measures, which was important for emerging rural credit facilities. Downstream, sediment inflow to the Yellow River system was reduced by 29 million tonnes annually in the program alone, before wider replication. This is particularly important in light of the South-to-North water transfer program proposed to transfer water from the Yangtze River to the Yellow River.



Lessons learned include the following. In terms of overcoming obstacles, cross-sector integration is essential. Also, the program was kept simple, despite pressure to build in many additional elements. Strong central support drove the process, along with buy-in by parties at the farm household, village, township, prefecture and provincial levels. An enabling environment was created as the program proceeded. For example, when the project started, there were no arrangements for private land ownership, so these arrangements, including new contract systems and methods for recording transactions, were created. Loess II entailed an iterative process that responded to new requirements as they emerged.

In terms of financing, unlike previous initiatives that were largely state-funded, the Loess II program was cost-shared with beneficiaries, including provinces, prefectures and farm households, resulting in a 60 percent cost recovery. Costs for catchment management were aggregated at the district level and higher watershed level. Flexibility was required and repayment schedules were re-adjusted in response to rates of land recovery and improved income streams.

Factors triggering the program included the accumulation of experience with the techniques, including both past successes and failures; the magnitude and urgency of the problems; the existence of a policy linking poverty alleviation to land and water management; and the recognition that action was needed in different parts of the basin, including both small- and large-scale initiatives.

With regards to stakeholder participation, the program instituted an appropriate process to involve beneficiaries in both the evaluation and selection of options from a diverse portfolio. The main concern was the capacity of government agencies to coordinate both vertically and horizontally. This was addressed by a combination of reorienting existing services delivery capacities and the introduction of new, flexible coordinating bodies and mechanisms.

## Development through Self-reliance: Reviving Hope and Prosperity through Traditional Water Harvesting Systems Alternatives to Big Dams

Shripad Dharmadhikary offered to comment on this paper. Mr. Dharmadhikary explained that, while he was not familiar with the paper, he was familiar with the work that had been done. The work had been executed by a small group, a cross between an NGO and a mass movement, that worked extensively in hundreds of



villages in the Indian state of Rajasthan. This is one of the most arid parts of India, very similar to the Loess Plateau. The area receives only 200 to 400 millimeters of rainfall. A traditional system of water management had sustained the area for centuries, but had fallen into disuse in recent years. As a result, rivers, wells and ponds had dried up. Agriculture was suffering badly and there was extensive migration from the area, mostly of male youth seeking employment in the cities.

About 15 years ago, a few of the people who had founded the group were committed to running schools and teaching. One of the elders came to them and said “look, if you really want to do something, see if you can revive these water structures.” So the group began a long process by which the traditional water harvesting structures, called “johads,” were rebuilt.

A johad is simply a small pond built by putting a little dam across a stream. Revival of one of the johads took two years because the group did all the work themselves and other people were reluctant to join them. But when the others saw the results of the johad, there was a lot of interest. The news spread through family contacts. People would tell their relatives that the river had been recharged and that for the first time in many years there was water in the wells.

Over time, this effort evolved into a big, mass movement with people in hundreds of villages building johads. The

johads were built with the labor of the villagers; there was practically no government funding. In fact, the government tried to stop some of these processes. The movement continued and, in eight or nine years, the combined effect of all these structures, along with other rainwater harvesting measures, soil and water conservation measures, plantations, and other efforts resulted in rivers that had been completely dry becoming perennial again, which was an important and symbolic achievement. The soil water content increased and agricultural productivity sky-rocketed. Villagers were able to provide irrigation water for two crops each year. The youth who had migrated could come back to their villages.

This process has now spread to more than a thousand villages. These villages have shown that small, decentralized rainwater harvesting measures built by the community can produce dramatic improvements in agricultural productivity, livelihoods and economy and can rejuvenate the environment. These options thus proved to be a viable alternative to large dams.

Along with the technology, even more important are the institutions that have emerged around this movement. Because the work was done through communities and community institutions, the spread of the movement has happened through community networks, through festivals and other social events. When one of the first rivers, the Arvari, became



perennial, the fish began to come back. The government, which was not at all responsible for the work, auctioned off the fishing rights to the river to contractors who came in from outside the area and a huge fight ensued. The contractors were forced to leave. In another case, when a community's wells became full again, some people began to cultivate sugar cane, which is an extremely water-intensive crop, and reduced the amount of water available to others. These incidents raised the question of how rights to resources are allocated and managed. The communities responded to this question by creating a River Parliament, which included representatives from all of the villages in the catchment, in contrast with most village organizations which only serve one or a few villages. The River Parliament established policies and guidelines that prescribed limits on crop types and on cultivation practices. This was an extremely important development in terms of equity in distribution of the resources that had been created. Mr. Dharmadhikary stated that these types of institutions can be built much more easily in a decentralized framework than in a centralized one.

### **Sourcebook on Stakeholder Involvement in Options Assessment in Water and Energy Projects**

Mr. Palmieri announced that the next case study would be on the World Bank "Sourcebook on Stakeholder Involvement in Options Assessment: Promoting Dialogue in Meeting Water and Energy Needs." He said he had requested 30 copies of the sourcebook, which contains several of case studies presented at the workshop, including the one presented by Mr. Haas, to be sent to the DDP secretariat in Nairobi for distribution to interested people. He also brought copies of the executive summary of the sourcebook with him to the workshop for distribution to workshop participants. As a third component of the sourcebook project the World Bank is compiling a training module. He then introduced himself to present the case study. He explained that he was presenting the case study because the lead author, Richard Davis, was unable to attend the workshop.

The sourcebook is one of the cornerstones the World Bank's Dams Planning, Management and Action Plan which Mr. Palmieri presented at the first Forum meeting in Nairobi the previous year. The World Bank undertook the action plan as part of its "dynamic" response to the WCD report. He explained that a dynamic response goes beyond saying what the Bank thinks of the report and makes use of the report. The Bank actually formulated this response following its review of the WCD report in a process involving extensive discussion with borrowers, other stakeholders, management and board.

The position of the Bank is that it will continue to support dams that are economically justified and environmentally and socially sound; a policy that was endorsed by the Bank's new Water Resources Sector Strategy which was approved by the board in February 2003.

Mr. Palmieri pointed out that the Bank had established "safeguard policies" to ensure that the projects it funds are subject to environmental assessments, minimize social and environmental impacts, involve notification and agreement between parties in international waterways and disclose information. The Bank currently faces the challenge of moving these safeguards further upstream and engaging governments before a final decision is reached on a specific project. He said that the World Bank, as well as the Asian and Inter-american Development Banks, face constant criticism from governments about their plethora of rules, so there was a challenge of harmonizing policies.

The Bank also needs to focus on client ownership and capacity because sending consultants from developed countries to tell people in developing countries what to do is not sustainable. He mentioned Mr. Dharmadhikary's presentation, which demonstrated how people can be very ingenious and devise their own way forward. He pointed out that there is a lot of local capacity that should be cultivated and built upon.

The purposes of the Dams Planning, Management and Action Plan are to use the WCD strategic priorities to look at projects in the pipeline; to provide operations support services for critical WCD-identified issues; and to produce "Knowledge Management" tools, drawing on existing studies, to further improve the quality of Bank work with borrowers on projects with dams. Mr. Palmieri emphasized that the action plan is not an additional set of policies, guidelines or rules but rather a set of resources for the Bank's task team to improve the way they execute operations with borrowers.

The sourcebook is a response to several priorities presented in the WCD report. It particularly responds to the priority for comprehensive options assessment and participatory decision-making as a core value, but it also addresses gaining public acceptance because bringing stakeholders together in a process is a key element in gaining acceptance of the process and its outcomes. He further explained that the sourcebook is not a recipe for success but more a menu of tools and processes that can help to deliver less controversial processes and projects and improve results.

The sourcebook is structured around four principles to put options assessment into practice: creating an enabling environment for stakeholder involvement in options assessment, involving all relevant stakeholders, assessing options strategically and comprehensively, and reaching a decision. He said that without an enabling environment that encourages stakeholders to express their opinions, it is almost useless to proceed with an options assessment because one would be creating a bad, public image of the process. He mentioned that the Bank was accumulating considerable experience on involving stakeholders. He referenced the DDP Steering Committee as a good example of a way forward. The committee members have different opinions, sometimes concurring and at other times dissenting, but the committee as a whole is moving forward. Inclusiveness is something to consider when designing these processes.

Mr. Palmieri pointed out that there are different levels in planning processes in which options are assessed, which would be discussed by working groups the following day. The key question is how comprehensive will the process be, especially since decision-makers are always working with limited information. He said that the DDP Steering Committee had discussed this question and decided that the stakeholders should decide how comprehensive the options assessment process should be and when to stop examining details. The most important point is to ensure that all options are on the table. The goal should be to reach a decision on how to meet a certain need. The identification of needs must occur before the process and will help in identifying relevant stakeholders.

Mr. Palmieri emphasized that, given the increase in up-front costs involved in performing comprehensive options assessments, it is essential to make the case for comprehensive options assessments to decision-makers. The extra time and cost involved in ensuring stakeholder involvement and comprehensive options assessment are outweighed by the benefits of improved development outcomes and risk management, but the process must be time compatible with the urgency of meeting the identified needs. Sometimes, immediate needs can be addressed while an options assessment on meeting longer-term needs is underway. The decision time for constructing large infrastructure can be quite long, especially if all stakeholders are involved in options assessment. The Bank has an example of studies and consultations being undertaken on a major investment at a centralized level but, at the same time, some of the needs were met using fast track, decentralized options.

He said that an important message from the WCD report is that decision-makers are prepared to invest more up front so long as the process is efficient and shows results. This does not mean that one should focus on structural versus non-structural options, but that the widest array of means to meet the need must be examined.

Mr. Palmieri explained that the staff of the World Bank often finds itself in the situation where a borrower is asking the Bank to fill a gap in the financing of a specific project that has already been selected. He said that it's very difficult to enter the decision-making process at that stage from a financing perspective. At the same time, the Bank is often asked by borrowers to enter a dialogue on a master plan or some other major planning scheme where the opportunity to assess options comprehensively still exists. The Water Sector Strategy is partly geared towards making the Bank a better partner in these kinds of exercises. This concept is also covered in other components of the action plan.

He pointed out that an important development in water resources planning and management is the concept of a life cycle of water infrastructure. This concept represents a break from the linear model, where a project is studied, designed, constructed and operated. Now the issue of what to do with aging infrastructure in terms of refurbishing or decommissioning has come to the center of the dams debate. There is a major investment of money, human resources and territory involved in the construction of a major storage or hydropower scheme, and that investment should deliver benefits for more than 40 to 60 years, or what ever makes the benefit/cost ratio equal to or greater than 1. The question of what to do with the project when the benefit stream is declining and who is responsible for funding the solution has illuminated the fact that this is, indeed, a cyclic process.

The question of extending the life of the infrastructure, as in the Wloclawek Dam example, involves a trade-off between reducing problems such as downstream erosion and reducing the benefits of the facility in terms of flood control, hydropower, etc., but that becomes a question of balance. In some cases, decommissioning is a better option but it is important to replace whatever services, if there are any remaining, are lost by ceasing operation of the dam.

Expected outcomes of the Stakeholder Involvement in Options Assessment project include making a contribution to knowledge and awareness building, better integration and strengthening of options assessments in World Bank-supported projects, and mainstreaming of good practice in the sectors of borrowers from the Bank.

## ANNEX 4:

### DELIBERATIONS AND OUTPUTS OF WORKING GROUPS

#### Working Group 1: Planning Levels and Scope of Analysis



**Presenters:** Donal O’Leary, Senior Power Engineer, Energy Sector, Africa Region, World Bank and Alison Doig, Public Affairs Officer, Intermediate Technology Development Group

Mr. O’Leary began to explain the deliberations of Working Group 1. He said that the most important thing to mention was that the discussion had been quite difficult because of a lack of focus resulting from the different experiences and perspectives of the participants, and the different meanings each participant assigns to the terms used in the discussion. The group was charged with focusing on the appropriate approach to take to comprehensive options assessments at the policy, strategic planning and project levels.

During the first discussion session, the group decided to record the major issues that had been raised during the plenary sessions and from their own experiences. The first issue that came up was stakeholder equity, specifically the fact that some stakeholders are weak and approaches need to be found to strengthen them so that they are equally able to influence process outcomes. Two related issues were the need for capacity building at all levels and the

considerable political influence of financiers, funders, and multi-national corporations on options assessment processes. Additionally, the question arose of how to integrate priorities between sectors, geographic areas and various administrative areas. There was a lot of discussion about international planning, particularly in Southern Africa. The linkages between options assessments at the various levels and macro-economic policies were discussed, as were the difficulties involved in engaging different stakeholders.

Mr. O’Leary said that the key point coming out of this discussion was the need for participants to get out of their “dam boxes.” That is, our perceptions are shaped by our experiences and by the institutions we represent. In order for comprehensive options assessments to operate correctly, participants need to be open to new ideas and to the perceptions of others.

During the second discussion session, the group tried to focus on what sort of things should be happening at and what sort of guidance should be emerging from the national policy level. The issue of what is known in the European Union as “subsidiarity,” concerning the need to place decision-making authority at the most appropriate level, cropped up. The group discussed the

relative roles of the public and private sectors in decision-making in different sectors involved in energy and water resources management and linkages between the needs in different sectors and macro-economic policies such as food security. An example was the influence of a country's decision to produce more food on water resource development.

During the final discussion session, at the policy level, the group had identified four key questions regarding what comprehensive options assessment consists of at different levels, who is performing comprehensive options assessments, what the problems with these processes are, and what recommendations can be made to improve these processes.

Dr. Doig identified issues involved in defining options assessment at the policy level. She said that the process was geared towards meeting targets that are based on priority needs. The needs enter the process and are prioritized at the macro-economic level. The priority needs feed into strategic government objectives and macro-economic objectives as well as international targets. The outputs at the policy level are the government's strategic, prioritized targets. The process at the policy level is primarily the government's responsibility, supported by a democratic process. As the WCD report specified, the process must be transparent and involve stakeholder consultation.

As for specific processes, the needs assessment should feed into sectoral planning. The sectors then enter an inter-sectoral negotiation process to prioritize the targets. Dr. Doig pointed out that there would be fervent lobbying at this point in the process and, therefore, that transparency was absolutely crucial. One of the major issues in this process and others is that some voices are louder than others.

Mr. O'Leary said that the objective at the strategic planning level was to define how the targets established at the national level would be achieved. He stressed the importance of having all options on the table at

this point in the process. The group assigned responsibility for administering the process at the strategic planning level to sector agencies of various governments. Two of the elements of the process identified by the group included resources assessment and prioritization of options using a multidisciplinary and cross-sectoral approach.

Problems that emerged at all three levels included powerful lobbying groups that attempt to influence decision-making behind the scenes and the difficulties of bringing unheard voices into the process. People also have internal constraints that the group referred to as "dam boxes," which include their training, the organizations they represent, where they work, etc. that can act as blinders, preventing their ability to perceive a broader perspective. The group discussed possible incentives to draw people out of their boxes and decided that, to a large extent, it is up to government to reward people who can think laterally as well as vertically.

At the project level, the group debated how projects can be compared if specific information is unavailable regarding the costs and benefits of each option and how much money and resources should be expended to facilitate the comparison of options at a project level. The sense of the group was that an iterative process was required that would go back and forth between defining options and checking with stakeholders on whether the options defined make sense. Even when a set of acceptable projects has been identified and a final option has been chosen, much work remains before the option can be implemented. Mr. O'Leary expressed concerns about the resources required for such a process and the need to make them as efficient as possible.

Dr. Doig explained that the sense of the group was that, in the past, decision-making processes moved from the policy level straight down to the project level, and that a lot of the controversy surrounding dams and development arises from the lack of a stakeholder negotiation phase in narrowing the choice of options.

## Final Output of Working Group 1: Planning Levels and Scope of Analysis

### Specific topics discussed in this session 1:

- Guiding criteria for Comprehensive Options Assessment at policy, strategic planning, intermediate and project levels
- Challenges and opportunities

Alison Doig (Facilitator)  
Shripad Dharmadhikary (Facilitator)  
Donal O'Leary (Rapporteur)  
Ute Collier  
Christine Eberlein  
Pedro Farah  
Yu Xiao Gang  
Brian Hollingworth  
Keith Kennedy  
Frans Koch  
Zhigang Liu  
Francisco Eduardo Mendes  
Bikash Pandey  
Peter Van Niekerk  
Birgit Zimmerle  
Constance Hunt

Intermediate Technology Development Group  
Naramada Bachao Andolan  
World Bank  
WWF-Living Waters Programme  
The Berne Declaration  
Laboratorio Interdisciplinar de Meio Ambiente  
Green Watershed  
Development Bank of South Africa  
Swiss Center for Hydrology  
International Energy Agency  
Ministry of Water Resources, China  
Laboratorio Interdisciplinar de Meio Ambiente  
Winrock International  
Department of Water Affairs and Forestry, South Africa  
German Carajas Forum  
DDP Secretariat

### Guiding Criteria for Options Assessment at policy development level:

Grassroots/local levels feed into national-scale priority/needs assessment in ministries responsible for each sector relevant to dams, such as energy, agriculture, environment and natural resources, transport, disaster management, etc.

Ministries assess economic, social and environmental resources available to satisfy needs and make recommendations regarding allocation of resources based on priorities articulated at grassroots/local levels, taking into consideration social objectives and international obligations.

The lead agency, most likely the Ministry of Water Resources, convenes delegates from each other relevant ministry to aggregate needs and priorities in a cross-sectoral process. Common ground is defined and needs perceived to conflict are negotiated. Process culminates in articulation of a set of targets, such as 500 MW of electricity generation by 2010 or 100 percent of population with access to adequate supplies of clean water and sanitation services by 2025.

Macro assessment of options to meet targets is conducted on a cross-sectoral basis with multi-stakeholder participation.

Government policy passes through democratic process – either parliament/congress or participatory, administrative process (public notice and comment). Final policy enacted as law or regulation.

Output of OA at policy level is a set of targets based on priorities/needs reflecting strategic, governmental objectives at a macroeconomic level.

### Guiding Criteria for OA at strategic planning level:

Agencies within each ministry identify all options available to meet policy targets with input and participation from multiple stakeholders in a transparent process.

Agencies select delegates to engage in a multi-sector, interdisciplinary process to compare options using appropriate tools.

Output of OA at strategic planning level is a strategic plan of options to meet targets.

### Guiding Criteria for OA at Intermediate Level<sup>12</sup>

The intermediate level is an iterative process between the strategy and project levels.

Government conducts a pre-feasibility study of all viable options for meeting targets, including preliminary assessment of physical, financial, environmental and social viability.

Government screens and ranks options through a multi-stakeholder process.

Output is a ranking of options to meet targets, including possible elimination of some options deemed infeasible.

### Guiding Criteria for OA at Project Level

Government facilitates multi-stakeholder, cross-sectoral feasibility study of one or more options that have survived screening and scored high in the ranking process. Feasibility study assesses how to mitigate adverse impacts of each option and how to optimize the benefits.

Feasibility study includes assessments of physical feasibility (e.g. if a dam, not to be constructed on a geologic fault), financial feasibility (monetary benefits outweigh costs), social and environmental assessments. Multi-stakeholder, interdisciplinary approach used to negotiate optimal outcome of each potential project. If agreed outcomes from the multi-stakeholder process would render a specific project infeasible, that project is eliminated as an option. If all projects are eliminated, return to intermediate level.

### Challenges and opportunities

#### ***Institutional and capacity building:***

Lobbying currently occurs at all levels in OA process. Strongest, most wealthy interests are currently able to “buy their way” into government decision-makers offices. Need to level playing field by creating a transparent process where all stakeholders are equal. The use of a transparent process should make it more difficult for powerful corporation (e.g.) to press their interests in “smoke-filled rooms.”

Structural conditions may influence options preferences (e.g. a multilateral lending institution may have direct links to government officials who would profit from low interest, large scale loans). Overhead costs for administering loans make larger projects more appealing to lenders, but also provide opportunity for graft/corruption at the national level. Bias towards large loans, large projects tends to eliminate smaller-scale, decentralized options from consideration.

Empowering weaker stakeholders involves capacity building. Education regarding possible options is necessary. Global information exchange of success stories would facilitate understanding of full range of options, subject to consideration of country- and site-specific contexts that may affect feasibility.

Many government agencies currently reward hierarchical behavior rather than cross-sectoral collaboration. Rewards systems need to change to favor inter-disciplinary, cross-sectoral outcomes rather than sectoral hierarchies.

Multi-stakeholder participation needs to be pushed upstream, and policy-making needs to be pushed down closer to grass roots level.

How can cross-sectoral integration be accomplished?

Funding:

Process is very expensive – will stakeholder inclusion and resulting risk minimization compensate for expenditures of time and money?

Who will fund the intermediate level? Most likely government since the intermediate level concerns public goods rather than private profit.

<sup>12</sup> Our group added this level because there was a sense that it is too often excluded from consideration and this exclusion is the source of much of the conflict engendered by dams and development decisions.

## Working Group 2: Identification of Options-Focus on Process



**Presenters:** Liqa Rashid-Sally, Senior Researcher and Matthew McCartney, Researcher, International Water Management Institute

Dr. Rashid-Sally presented the initial deliberations of Working Group 2, which had been charged with focusing on the process of option identification. The group agreed that, without a proper needs assessment, it is virtually impossible to consider options. Thus, they spent some time discussing what the requirements would be for a needs assessment that paves the way for consideration of all potential options.

The group realized at the start that the policy, strategic planning and project levels link up throughout the options assessment process, and that the processes and institutions established at the strategic planning and project levels should reflect those established at the policy level.

Mathew McCartney presented the final outcomes of Working Group 2. He said that the group had discussed the interpretation of different planning levels and the commitment needed to examine options at an early stage in the planning process. The group identified the knowledge base and description of various options and what they can deliver as very important.

The group then tried to sort the various issues it had been asked to address into the three planning levels and found that there was quite a bit of overlap. They decided that, while some issues fit neatly into one planning level,

the other issues were relevant at all three levels.

Regarding the institutional set-up at the policy level, the group determined that mechanisms for comprehensive options assessment need to be established to develop policy guidelines, promote the representation of all interests at the national level, and facilitate the flow of information between planning levels and across sectors to achieve vertical and horizontal integration. Mr. McCartney said that the group was looking for clear policies on public participation in the areas of water-related policy and strategy formulation, and that the consideration of indigenous knowledge and solutions was lacking. The group felt that an enabling environment to consider those options needs to be created.

At the strategic planning level, there needs to be a recognized, institutional mechanism for allocating water among sectors and that mechanism would require periodic reviews of both demands and options for satisfying those demands. A portfolio of options is also needed, and that portfolio should be explicit so that everybody knows exactly what options have been considered. In addition, the group agreed that the screening process should be documented and made publicly available so that interested parties can understand why certain options have been either rejected or taken to the next level of consideration.

At the project level, all potentially affected people should be represented. In contrast, at the national policy level,

representatives of stakeholders and users should be included in the process, perhaps with some representation of people who might be affected. Also, an effective mechanism for disseminating information is critical at the project level.

Regarding criteria for establishing thresholds of acceptability, the group thought that the policy framework should explicitly explain the goals of the comprehensive options assessment and the processes that would be used to achieve them. There should also be recognition that there will be both synergies and inconsistencies in policy criteria across sectors and that these synergies and inconsistencies should be addressed at the policy level.

The group agreed that a transparent, participatory process should be established at the strategic planning level. Aspects to be covered should include equity, efficiency of natural resource use, sustainability, and the capacity of countries for operation and maintenance. At the project level, the criteria for options should be developed in a participatory manner.

Mr. McCartney said that the group did not try to define interrelationships, but simply said that, in the needs assessment, it should be explicitly stated at the outset

and that all stakeholders in the process must agree on what they are trying to achieve and how long it will take. An explicitly defined timeframe is important to avoid essentially endless debates in which participants never accept that a solution has been identified.

Regarding funding, comprehensive options assessment will require increased funding for multi-stakeholder participation, data gathering, information sharing, etc. The process will add to the costs of projects, but the funding at the strategic planning level is a government responsibility, perhaps with assistance from donors. It was suggested that, at this level, the process should ideally be conducted by catchment management authorities financed by fees from people living in the basin. At the project level, funding for comprehensive options assessments should come from the project promoters, although the issue of who should fund public participation at this level was not completely resolved and the group felt that that aspect may also require government support. Finally, financial assistance is required to improve the knowledge base on traditional or alternative options. At the moment, Mr. McCartney pointed out, options based on traditional knowledge are not often considered largely because the knowledge base is lacking.



## Final Output of Working Group 2: Identification of Options - Focus on process

### Specific topics proposed for discussion in this Session 2:

- Institutional set up for decision making process at various planning levels
- Stakeholder involvement and public participation in options identification
- Incorporation of grassroots approaches and local perspectives into the identification process
- Criteria for establishing thresholds of acceptability or rejection of certain options at an early stage

Jean-Etienne Klimpt (Facilitator)  
Liqa Raschid-Sally (Facilitator)  
Andrew Tanner  
Heather Malan  
Mathew McCartney (Rapporteur)  
Naeem Iqbal  
Alain Gregoire  
Sheng Jinbao  
Larry Haas  
Jeremy Bird

Hydro-Quebec, Canada  
International Water Management Institute  
Ninham Shand Consultants, South Africa  
Freshwater Unit, Univ of Cape Town  
International Water Management Institute  
Sungi Foundation, Pakistan  
Electricite de France  
Ministry of Water Resources, China  
Independent Consultant  
DDP Secretariat

### Interpretation of the planning levels:

*Policy* – at international (e.g. protocols), regional or national level (water, energy agriculture)

*Strategic Planning* - at basin level – cross sectoral

*Project* – options examined throughout the project cycle – periodic reviews etc. Some question on where the boundary is between strategic planning and project levels – i.e. between pre-feasibility and feasibility studies?

### Prerequisites:

Policy level direction clearly articulated e.g. development and economic goals, agriculture policy, water delivery targets, environmental protection policy, other sectoral priorities associated with water, guidance on primacy of options ...

Starting point for options assessment: Quantified needs are defined from strategic level studies – refer to output from Group 1

Clear understanding of transboundary agreements and their implications for options assessment

Commitment to examine options at an early stage of the planning process

A knowledge base is required that describes what each

of the various options can deliver – opportunities and limitations of the options.

Data available on natural resource endowment, hydrology, environment, traditional approaches, existing infrastructure capacity etc

### 1. Institutional set up:

#### **Policy level:**

Responsibilities for national and provincial policy defined (vertical interaction)– buying from one level to another (both ways) and clear responsibilities  
Horizontal interaction (cross-sectoral)

Mechanism for Options Assessment established to develop policy guidance, promote representation of all interests at national level and facilitate information flows between planning levels and across sectors.

A clear policy on public participation in water related policy and strategy formulation is in place.

Institutions need to be structured and have capacity for assessing the full range of options.

An enabling environment to consider indigenous alternatives is provided.

Independence of groups undertaking options is promoted.

Capacity for research and feedback is developed on various options (including traditional and new options) and on the process of needs definition.

**Strategic planning level:**

Basin process identifies and reviews cross-sectoral development needs for water, avoids dominance of one sector, provides a continuous process with periodic milestones and is oriented to developing enhancing portfolio of options.

A recognised institutional mechanism is established for allocating water among sectors that periodically reviews demands and options and the implementation of policy provisions.

The options assessment process formalises input of local government, experts, users and other stakeholders and grassroots needs are reflected in strategic planning through appropriate representation arrangements.

The portfolio of alternatives being considered is made explicit.

Mechanisms in place to document and share information on newly implemented or emerging alternatives.

The options screening process should be documented and made publicly available. It will record why individual options were rejected or included in subsequent stages of the process.

Include an appeal mechanism for lack of compliance with the options assessment process

**Project level:**

All potentially affected people (positively and negatively) are represented. A process for consultative group to assess project options is established.

Effective mechanisms for information dissemination are in place.

Outcomes of decisions are recorded in a formalised way recognising that these are important input for future project related processes.

**2. Incorporation of grassroots approaches and local perspectives:**

See proposals listed under Issue 1. 'Institutional set up'.

**3. Criteria for establishing thresholds of acceptability:**

**Policy level:**

Policy framework explicitly defines goals and the process to achieve them, including guidance or criteria on thresholds for acceptability or rejection.

Recognise there will be both synergies and inconsistencies in policy criteria across sectors and administrative levels to be addressed

**Strategic planning level:**

Transparent participatory process for developing and implementing criteria for evaluating alternatives and weighting economic, social and environmental factors.

Aspects considered include equity, efficiency of natural resource utilisation, sustainability and the capacity of countries for operation and maintenance.

**Project level:**

Criteria for project level options assessment need to be developed in a participatory process

**A. Timeframe and inter-relationships:**

Needs assessment to be explicitly stated at the outset.

The planning process is dynamic and there should be a recognition that policies and strategies are updated periodically. There is flexibility to accommodate new opportunities.

Projects to satisfy agreed immediate short term needs can be implemented in parallel to longer term strategy development.

Proposed projects deferred from an earlier strategic planning process could be open for review.

Timeframe for options assessment depends on level of data already available.

Agreement required from all stakeholders that process is working towards a decision, on clearly defined timeframe for intermediate milestones, and on the nature of output or deliverables.

### **B. Stakeholder involvement and public participation:**

Dealt with in Issue 1 'Institutional set up'

### **C. Funding**

Comprehensive options assessment process will increase planning costs - e.g. participation, data gathering, information sharing.

Funding of strategic options assessment is a government responsibility and should be independent of individual project promoters.

Where donor support is required, the importance of strategic options assessment is reflected in country assistance programmes and timeframes and deliverables are agreed.

Financial assistance is required to improve the knowledge base on traditional initiatives.

While recognising that a portion of user fees are allocated to finance options assessment processes, transition arrangements will be required to attain this principle where this capacity does not yet exist.

At project level, funding options assessment (e.g. optimisation, benefit sharing, etc) is responsibility of project promoter.

Mechanisms such as trust funds can be established to finance participation of stakeholders and maintain independence from the organisations providing the funds.

### Working Group 3: Assessment Tools



**Presenter:** Manfred Konukiewitz, Head of Infrastructure Division, Federal Ministry for Economic Co-operation and Development, Germany

Dr. Konukiewitz presented the work of Group 3 on assessment tools. He said that the group's first round of discussion focused on the desired features of assessment tools, such as completeness and comprehensiveness, which means that capability to include all potential options. Another key feature was the ability to equally reflect economic, environmental and social aspects. The group acknowledged that the environmental and social aspects most likely will not be expressed in dollar values. Therefore, a tool must include other methods for evaluating the effects of various options on social and environmental conditions.

Dr. Konukiewitz reflected the group's opinion that the tools aren't automatic decision-making machines, but the basis of, or support for, a decision-making process. Therefore, the capability of the tools should not be over-exaggerated. Finally, he said we have to expect that through the weighing of different factors, different results will emerge when different people are operating the tools.

A great deal of the group's discussion revolved around the definition of the three levels of options assessment. They had defined the policy level as a national policy level despite the fact that policies can be made at any level, such as the basin or village level. The group compared the national policy level with the development of a vision or the implementation of goals.

An important aspect was that it was not necessarily the government of a country who set such a vision or set of goals. It could also be done by a utility. The example was given of Italy where, if the government does not establish goals, the Ente Nazionale per L'energia Elettrica probably has a vision and goals for the country's energy policy. The vision and set of goals can be a basis for a public debate because ultimately the reason for establishing such goals is so they can be debated.

Scenario analysis was proposed as a tool to support the creation of a vision for the long-term future by positing certain alternative scenarios, none of which is considered a forecast, or the "true" picture, of the future. The attractiveness of scenario analysis stems in part from the failure of past long-term, energy demand forecasts to correctly predict future conditions. Desirable characteristics of scenario analysis identified by the group included that they be demand-driven, but that they do not simply extrapolate contemporary trends but also consider future possibilities, such as expansion of demand-side management approaches.

Dr. Konukiewitz said the next topic discussed by the group was the analysis of the availability of resources and technologies. On the political level, this analysis is difficult, but it is imperative that future technological developments not be excluded by today's descriptions of the future. He pointed out that scenario analysis must take into account the full cost of every option in the widest sense, not only economic values but also social and environmental values even if it is not possible to quantify these in monetary terms. Finally,

the scenario analysis must include a risk assessment characterizing the risks involved in each scenario.

He mentioned that the group had an extensive discussion regarding the definition and boundaries of the strategic planning and project levels. The group did not attempt to define these levels in a legal sense, but there was discussion of contrasting concepts. For example, on the subject of scope, the strategic level is open to all technologies but at the project level there is a defined technology. The strategic level addresses options for meeting needs of a large area, such as the entire country, and the project level addresses a smaller area, such as a river basin. Timeframes also distinguish between these levels, with decades required for decision-making at the strategic planning level and years required at the project level. Another criteria was the owner of the process, which at the strategic planning level should be primarily the government and at a project level should be primarily private organizations. One last distinction drawn between these levels by the group was that the strategic planning level could embrace demand-side approaches, while the project level would focus on the supply-side. The group then terminated this line of discussion and agreed that it was more appropriate for the definition of different levels to be defined by Working Group 1.

The group then turned to the question of what tools are available. At the strategic level, a comprehensive portfolio of options should be available if integrated resource management is to occur, but this was identified as the responsibility of Working Group 2. The tool for assessing these options could be a multi-criteria analysis, which was the content of a case study presented the previous day. Such an analysis must include environmental and social impact assessments. This tool must be more detailed at the project level than it is at the strategic planning level so that it can lead to optimization of the final project. The group then inquired into what level of detail would be required at the two levels and decided that a strategic decision sets a boundary or framework for project activities. After a project has been selected, there is a danger of finding that the analysis at the strategic planning level was seriously flawed because of a lack of data, which could disturb the entire process operating at all three levels.

Dr. Konukiewitz said that the limited amount of detail at the strategic planning level must be accepted, however it is important to acknowledge that this is the level where, according to the WCD report, the most public debate and participation of stakeholders is required in order to avoid the criticism that the ultimate choice of a project was pre-determined. So there must be upstream participation at the strategic planning

levels, but there may be difficulties tied to lack of detail.

Dr. Konukiewitz expressed some doubts on the part of the working group facilitators relating to the technical nature of the issues of which tools to use in comprehensive options assessments and what levels of detail are required. He said that the participants in the group did not possess adequate expertise in the technical aspects of options assessment tools, so they should not be expected to specify the technical requirements for such tools. He said the group discussed criteria for the selection of tools but was unable to provide specific details on what criteria should be included in choosing tools to support the selection of options at the three different levels. He suggested that the issue of criteria might need to be addressed in a separate group of specialists on the topic, since at the end of the options assessment process at each level, there will be discussions about whether or not the analysis was appropriate.

Dr. Konukiewitz said that the general criteria required of these tools include replicability and transparency because the tools constitute a platform for making future decisions. The tools should provide a mechanism for the assessment of values for environmental and social dimensions so that these can be incorporated into options assessments. The group discussed the scope of the comprehensive options assessment and decided that, because of the varying resources and capacity available in different countries, the scope of the process must be decided on a case-by-case basis.

The tools must also incorporate areas of risk and risk analysis, including risks relating to data reliability, the accuracy of demand forecasts, climate change, financial conditions and the uncertainties of operational capacities into all three levels of comprehensive options assessment, with the main emphasis at the project level. The group found that risk analysis is a complement to the degree of detailed data and accuracy of the data fed into the tool. At the policy level, for example, there is a lesser degree of detailed data. Therefore, the risk of inaccuracy is greater at that level than at lower levels where more detailed information is available.

Benefit-sharing as a principle should be treated at the policy and strategic planning levels, but benefit-sharing mechanisms can only be developed and applied at the project level when the details of the benefits and costs of the selected option are known.

In contrast, cumulative impact analysis cannot be accomplished at the project level because, by definition, such an analysis considers the additive and synergistic effects of a number of separate projects. Thus,

cumulative impact analysis must be performed at the policy and strategic planning levels. There is, however, a linkage between cumulative impact assessment at the strategic planning levels and decisions taken at the project level, since a potential investor in an individual project should understand what cumulative risk is involved in his project and this information is developed at the strategic planning level. An example was given of a wind farm, where an investor in a single wind turbine cannot address the cumulative impacts of all the windmills on the farm.

Regarding timeframes and interrelationships between upper and lower assessment levels and short term needs, the group proposed that the timeframe for a policy should be 20 to 30 years, the timeframe for strategic planning should be 5 to 10 years, and the timeframe for a project should be 2 to 5 years. These timeframes were established for the options assessment process, not for project implementation. There is also the other direction of influence when, due to the degree of accuracy or inaccuracy or the quality of the assumptions incorporated into the analysis, at the detailed project level it turns out that the assumptions made at the policy level are wrong. In such cases, an iteration of the entire process is required.

Regarding stakeholder participation, national representatives of stakeholder groups should participate at the policy level and local representation should be the focus at the project level. The policy level should appropriately include government, national agencies, professional agencies, special interest groups, private companies, NGOs and the media. Dr. Konukiewicz said that policy level consultations in Germany are conducted in the form of a public hearing where representatives from these organizations are invited to

give comment on proposals and to advise government bodies. Funding for the dialogue process at this level should come from government and/or international financing institutions. In cases where government funds are lacking, public funding from bilateral donors might be requested.

At the project level, participants should include the developer; regulators, who set the framework for the project; affected people; beneficiaries; investors; and the media. Bi-lateral donors or the developer is responsible for generating funding at this level. The organization performing the options assessment can be public, private, or as demonstrated in the presentation by WWF, an NGO, on the Wloclawek Dam.

Participants at the strategic planning level should include government, utilities, consultants, basin or provincial agencies, the private sector, professional associations, special interest groups, affected people (because by then, it is clear where a project will be implemented), and the media. Funding for the dialogue process is most likely the responsibility of the government, since at this level the eventual project implementers will most likely not have been identified or their jobs will not yet have been secured. The discussion brought out the relative underdevelopment of options assessments at the strategic planning level, relating largely to uncertainty over who should pay for it.

Dr. Konukiewicz ended his presentation by emphasizing that people involved in promoting comprehensive options assessments should have a focus on financing such strategic planning and ensuring that the project planning is properly embedded in the strategic level.

## Final Output of Working Group 3: Assessment Tools, 23 September 2003

### Specific topics proposed for discussion in this Session 3:

- Which tools are useful for which policy level?
- Objectivity: can we really plan objectivity (or) are they always subjective?
- How do we involve the stakeholders in the assessment process?
- How to ensure transparency in the assessment process?
- Issue of complexity: how to deal with the complexity of analysis?
- The limited absorbing capacity of the decision-makers in dealing with such complex models and decision-data.

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### Prescribed planning levels and group 3's feedback:

**Policy level** – It was understood that 'Policy Level' in the given table comprised three levels, i.e., 1. international, 2. regional and 3. national. However, Group 3

considered only the National policy level. The reason for taking this decision by all participants is that the theme of the working group 3, "Assessment Tools", is most relevant to the National policy level and less to the other two. The group discussed about who is making the policies. Historical records showed that power

companies are involved in national policy making. For example, the Ente Nazionale per L'energia Elettrica in Italy had influenced, if not drafted, the energy policy.

**Strategic Planning** – It was understood that strategic planning level includes basin level and cross-sectoral domains. Group 3 recommended the need to establish the basin organizations/institutions. There are very clear upward and downward relationships/inter-linkages among 'Policy Level', 'Strategic Planning level' and 'Project level' in three areas namely, benefit sharing mechanisms integrated distribution, time frame, short term needs, and funding. (See Slide 1).

**Project** – An extensive discussion regarding the definition and boundaries of the strategic planning and project levels was made. It was agreed that at the project level there is a defined technology. To important points were highlighted and agreed by the group. These are 1. to optimize the projects by utilizing appropriate assessment tools and 2. to ensure the stakeholders involvement.

### Guiding criteria OA at policy development levels

Group 3 considered the national policy level, non-site specific. Essential points are as follows:

- New Assessment
- Define National Goal
- Clarify Assumptions
- Define Resources
- Tool: Scenario Analysis (Map future options and implications)
  - Need
  - Resources
  - Full costs
  - Environmental Aspects
  - Social Aspects
  - Cumulative Effects
- Present to Public

Guiding criteria OA at strategic planning level

- 5-10 year timeframe
- Scope: technology not yet defined
- Strategy to implement policy goals
- Actors: Governments (decision makers)
- Basin level strategy should be considered
- Integrated Resources Planning
- Tools: Multi-criteria Analysis (define assumptions)
- Strategic Environmental Impact Assessment tools
- Strategic Social Impact Assessment tools

- Economic Analysis
- Portfolio of Options
- Costs: data availability

### Guiding criteria OA at project level

- To optimize projects
- Stakeholders involvement

### Challenges and opportunities

The challenges (or obstacles) are lack of information about tools, their completeness, end-users' acceptability due to over simplicity and/or super complexity of models, cost of data, lack of familiarity with models/tools, and willingness to apply them. Opportunities are:

1. Assessment tools (models) can help better and deeper understanding of the option assessment process for all actors involved, which in turn is that consensus can be reached faster.
2. cost cutting to some extent if free and inexpensive models/tools are accessible to the end-users;

### Concluding remarks

The assessments tools are termed decision-support system tools. These should not be mistaken as decision-making tools. Moreover, different input and subjectivity involved in the process of weighing of different factors, different and or controversial results could emerge by different end-users.

It was proposed that the DDP Secretariat should compile the list of useful tools for the various policy development levels, strategic planning level and the project level and make information available. Useful tools are available for free and at cost.

## Working Group 4: Process of Implementation



**Presenter:** John Ritchie, Vice President, Hydropower and Water Resources, Acres International

Mr. Ritchie presented the deliberations of the final working group on implementation. He said that, like the other groups, the question of the relationship between the strategic planning and project levels arose in Working Group 4. The group attempted to conceptualize the inter-relationships between the three levels. This led to a discussion of how projects are often triggered by policies and strategic planning work.

When talking about processes, Mr. Ritchie explained, there is no magic solution. The exercise of developing comprehensive options assessments is a learning process that will require multiple cycles. Several projects will be needed to develop comprehensive options assessment experience in any particular country. It is a continuous improvement exercise.

Mr. Ritchie said that the group had picked up some themes from the other groups and that there are some common threads running through the discussions. When looking at the three levels, the group concluded that there were many interactions between the levels and that it was often difficult to establish at which level the process was operating. Rather than attempting to prescribe a perfect process, the group expects that the

options assessment process will cycle through the policy, strategic planning and project levels several times. Rather than insisting on establishing the perfect process from the start, the group recommended just starting where we are and continuing to work through the process until we have an appropriate balance of work at each level. At this point, he said, even a project can be a triggering factor for a comprehensive options assessment process.

The group worked on identifying obstacles to and triggering factors for developing comprehensive options assessments within countries and decided that the two concepts are the same and that they are merely different sides of the same coin. The group then focused on how obstacles could be turned into triggering factors and on what measures can be taken to improve the enabling environment. Because stakeholder involvement is important at every level, the group did not discuss it in every case. Funding is also needed at all stages, but the group highlighted specific funding needs and potential funding sources.

The group identified ten factors that could serve as either obstacles or triggering factors. These included government systems, international agreements, specific projects, courts and legal systems, donor policies and access to funding, regulatory structures and reform,

NGOs, physical contexts, knowledge or bias regarding options or processes, and indigenous people and local communities.

The group placed two sub-headings under government and government systems. These were accountability and transparency – which are obstacles where they do not exist and triggering factors where they do, and explicit water policies, which are viewed the same way. A key element is to incorporate options assessment explicitly into water policy, to make sure that the policy requires it. In addition, governments must explicitly involve stakeholders in establishing the policy. The Philippines, where this provision is explicit in setting water policy, was mentioned as an example.

With regard to international agreements, two examples mentioned were international water treaties such as the Lesotho Highlands treaty and international protocols and agreements, such as the Kyoto protocol. Under the heading of water treaties, the requirement to improve the environment, provide for periodic reviews and conduct comprehensive options assessments can be included in the treaties. Under international protocols, the signals from those protocols can be incorporated into options assessments. An example given was that of Canada ratifying the Kyoto Protocol. What needs to happen next is the incorporation of the protocol's requirements and parameters into the options assessment so that, for example, greenhouse gas quantification becomes part of the options assessment process followed by Canada, as should an assessment of vulnerability to climate change.

With regard to projects, complications set in because, although projects provide opportunities for debate and can attract people to perform options assessments, they can also lead to a lot of controversies because projects are generated that lack contexts. The conclusion of this discussion was that, to move forward, we need to ensure that options assessment is done first, before projects are selected. As reflected by other working groups, this process needs to be carried out at the strategic planning level. Within projects, a range of options is required.

Courts and legal systems can provide legal tools for enforcing consultations, they can be used to stop projects and they can provide a basis for harmonizing legislation. These tools can be improved by providing good environmental assessment laws and by ensuring that alternative dispute resolution is incorporated into disputes that arise from options assessments.

The issue involved in donor policy and access to funding is the perception that international financial institutions favor large loans. Support documents, like

the documents described by the World Bank on the previous day, should be developed to promote policy reforms in the countries where these institutions are working. Also, the institutions should favor countries that perform good options assessments, and fund strategic options assessments. Grant funding is needed from bilateral donors and international financial institutions. The group also recommended the establishment of a revolving fund or a partially revolving fund that could be replenished when a project is realized following a strategic options assessment.

Regarding regulatory structures and reforms, the issues include that the private sector focus may be perceived to foreclose, or may actually foreclose, options assessment; that dam safety and licensing roles need better definition – an issue that requires clarity but may not actually constrain options assessments. Recommended measures include encouraging options assessments at the basin level and ensuring that options assessments occur before tender documents are prepared and definitely before tendering occurs if private companies are bidding on projects.

NGOs can provide valuable functions on many fronts, including serving as watchdogs on transparency and quality of comprehensive options assessments to bring accountability to the process. Areas in which the effectiveness of NGOs can be improved include finding ways to enhance their capability to carry out studies along the lines of the assessment prepared by WWF in Poland. The ability of NGOs to facilitate debates over options and to bring community options forward can also be enhanced. The group identified this a priority area for funding.

With regard to physical contexts, this concept refers to geographical factors that might encourage or discourage an option from being considered, such as the presence of geothermal potential, for example. The conclusion of the group was that a more narrowly focused portfolio of options was needed in such cases, but that decision-makers, project developers and stakeholders should be creative when discussing the remaining, viable options.

With regard to knowledge or bias regarding options or processes, whoever is implementing an options assessment process comes with a biased perspective that favors certain options or limits other options in the course of the analysis. This bias may simply reflect a lack of knowledge regarding certain options compared with others. The group had a very interesting discussion on the use of biogas in Nepal. It was acknowledged that the energy authority in Nepal might not be a specialist in biogas and therefore might not consider that option

as readily as an electricity supply option. The key issues therefore are how to ensure that knowledge of options is disseminated and how to avoid compartmentalization of knowledge, which can reduce the understanding of various options. Suggestions for improvement included creating and sharing data bases on options assessment, promoting pilot projects to demonstrate the viability of different options, and clarification of the options to promote transparency in the options assessment process and to minimize bias. The group identified this as an area for priority funding.

Indigenous people and local communities help to define needs and problems in specific areas and also have a role as options promoters, as in the Rajasthan example. Measures to improve their effectiveness as triggering factors include the promotion and use of benefit distribution analysis and the implementation of options assessment processes that explicitly address benefit sharing. Indigenous people and local communities need to be confident that their opinions will be heard and included. This is also an area for priority funding.

## Final Output of Working Group 4: Process of Implementation

### Specific topics proposed for discussion in this Session 4:

- Obstacles and triggering factors for embarking governments and society on comprehensive options assessment
- Institutional and capacity building: how to move forward with the assessment while improving and enabling the environment

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 Gopal Siwakoti  
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 Wanjiku Kaniaru

World Bank  
 Tebtebba Foundation European Office  
 Water and Energy Users Federation  
 Ministry of Water Resources - Nepal  
 Acres International  
 Friends of the Earth Japan  
 Environmental Monitoring Group  
 Inter-American Development Bank  
 Legal Assistance Centre, Namibia  
 International Rivers Network  
 DDP Secretariat

### 1. Interpretation of the Policy/Strategic Planning/Project Levels

- Linkages exist between policy/strategic planning and project levels
- Obstacles can be translated into triggering factors and vice-versa depending on the differentiated reality/context in which the comprehensive options assessment is being carried out

### 2. Key Factors Identified Preventing Governments and Society From Embarking on Comprehensive Options Assessment

A list of ten factors were identified as both possible obstacles or triggering factors for options assessment:-

- Governments/governance systems – they can help or hinder
- International agreements and commitments – they provide a framework
- Projects – they can trigger interest by NGOs, affected people
- Courts/legal systems – they can help or hinder
- Donor policies/access to funding
- Regulatory structures and reform – can constrain scope of options assessment

- NGOs
- Physical context – can limit options
- Knowledge/bias on options/processes
- Indigenous people/local communities

### 3. Transforming Obstacles into Triggering Factors for the Comprehensive Options Assessment Process – Key Factors to Consider

- i) Governments/governance systems
  - Transparency and accountability
  - Explicit water policies
- ii) International Agreements and Commitments
  - International water treaties
  - International protocols, for example, Kyoto, MDG's, human rights treaties, regional, NEPAD
- iii) Projects
  - Trigger and funds availability can be positive
  - Projects need to be presented in the context of options assessment

iv) Courts/Legal Systems

- Can force consultation - can stop projects
- Can harmonise legislation

v) Donor Policies/Access to Funding

- Perception of IFI's and bilaterals favouring large loans. Lack of funding can prevent options assessment from happening.

vi) Regulatory Structures and Reform

- Private sector may foreclose options assessment
- Dam safety and licensing roles

vii) Physical Context

- Can limit options

viii) NGOs

- Ability and action to perform and table their analysis needs to be developed
- Accountability is important

ix) Knowledge/Bias on Options/Processes

- Compartmentalized knowledge reduces understanding of options
- Capacity building is necessary to disseminate information about options assessment

x) Indigenous People/Local Communities

- Realize needs and problems
- Communities role as options assessment promoters

#### 4. How to Move Forward with the Options Assessment

i) Policy Level

- incorporate options assessment in water policies
- provide for review/options assessment
- incorporate for example issues such as climate change into options assessment
- Government to facilitate stakeholder input to water policy

ii) Strategic Planning Level

- do options assessment first
- ensure a range of options is presented
- integrate options assessment into environmental assessment
- good environmental assessment laws
- prefer alternative dispute resolution (ADR) in options assessment disputes
- develop support documents
- support policy reform
- secure funds for strategic options assessment
- encourage options assessment at basin level
- options assessment before tendering relevant documents
- ability to facilitate debate and bring community opinions
- grant funding (bilaterals and IFI's)
- revolving/part revolving fund to support options assessment

iii) Project Level

- create and share knowledge base eg options assessment demonstration projects
- transparency/inclusion to eliminate bias
- promote use of distributional analysis of benefits
- options assessment with benefit sharing