

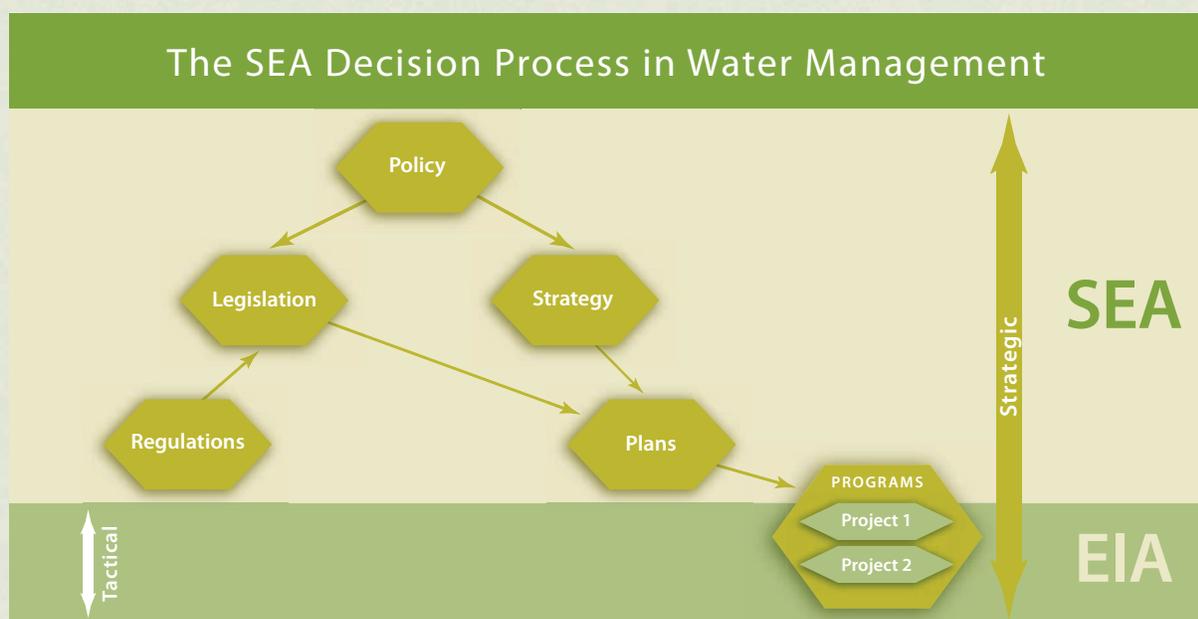


Strategic Environmental Assessment

Improving Water Resources Governance and Decision Making: Case Studies

Rafik Hirji and Richard Davis

April 2009





THE WORLD BANK ENVIRONMENT DEPARTMENT

Strategic Environmental Assessment

*Improving Water Resources Governance
and Decision Making*

Case Studies

Rafik Hirji and Richard Davis

April 2009

© The International Bank for Reconstruction
and Development/THE WORLD BANK
1818 H Street, N.W.
Washington, D.C. 20433, U.S.A.

Manufactured in the United States of America
First printing April 2009

Design: Jim Cantrell
Cover graphic: Rafik Hirji

Contents

ACKNOWLEDGMENTS v

FOREWORD vii

EXECUTIVE SUMMARY ix

Section A: Case Studies of SEAs in the Water Sector 1

Overview of Case Studies and Assessment Method 3

Case Study 1. SEA for Water Supply/Sanitation Reform in Colombia 7

Case Study 2. Rapid Water Resources Assessment, Tanzania 13

Case Study 3. SEA for the Plan of Main River Basins, Czech Republic 19

Case Study 4. Nepal Medium Hydropower SEA 25

Case Study 5. SEA for WATSAL Loan, Indonesia 31

Case Study 6. Environmental Flow Assessment, Pioneer Catchment, Queensland 35

Case Study 7. SEA of Mhlathuze Catchment, South Africa 39

Case Study 8. SEA for Water Resources Planning, Palar Basin, India 45

Case Study 9. Nam Theun II Hydropower Development, Lao Peoples Democratic Republic 51

Case Study 10. Transboundary Diagnostic Analysis and Strategic Action Program,
Lake Victoria, East Africa 55

Section B: Integration of Environment into Water Policies 61

Four National and State Water Policies 63

Acknowledgments

This report titled, “Strategic Environmental Assessment: Improving Water Resources Governance and Decision Making: Case Studies” was prepared by Rafik Hirji (ETWWA) and Richard Davis (consultant). It, and a complementary report that synthesizes the case studies (Main Report) to be published separately, are based on the economic and sector analysis—Strategic Environmental Assessment and Integrated Water Resources Management—that was jointly supported by the Environment Department and Energy, Transport and Water Department and completed in June 2007¹. The authors are grateful for the support they received from all individuals within and outside the Bank.

The economic and sector work (ESW) team comprised of Rafik Hirji (Task Team Leader, ETWWA), Richard Davis (consultant), Kisa Mfalila (consultant), Marcus Wishart (YP, AFTU1), Fernando Loayza (strategic environmental assessment specialist, ENV), and Bob Livernash (consultant). The production of this report was supported by the Bank Netherlands Water Partnership (BNWP).

Laura Tlaiye and James Warren Evans provided overall guidance to the ESW. Kulsum Ahmed provided guidance during development of the project concept and facilitated access to the SEA team and experts to support the overall process. Michele de Nevers, Abel Mejia and Jamal Saghir supported the preparation of this report.

Guy Alaerts, Arati Belle, John A. Boyle, Ladisy Chengula, Satish Choy, Santiago Enriquez, Jakob Granit, Nagaraja Rao Harshadeep, Mudassar Imran, Sumith Pilapitiya, Poonam Pillai, Martin Smutny, Ernesto Sanchez-Triana, Dirk Versfeld, and Ilse Steyl provided information on the various case studies reported in the ESW.

Maher Abu-Taleb, Paula Posas, Maria Sarraf, Barry Sadler, Will Fargher, and Albert Tuinhof also provided valuable information.

Helpful comments were provided by Vahid Alavian, Stefano Pagiola, Salman Salman, Charles di Leva, Harshadeep Nagaraja Rao, Winston Yu, Daniel Gross, Harvey van Veldhuizen, and Xiaokai Li at the project concept review meeting. Barbara Miller, Jakob Granit, Alessandro Palmieri, and Salman Salman, provided valuable comments for the ESW decision meeting.

Ernesto Sanchez-Triana (SASES), Jiri Dusik (SEA expert, Czech Republic), and Harshadeep Nagaraja Rao (AFTNL) were peer reviewers of the ESW.

¹ The ESW is available electronically in the World Bank SEA Toolkit.

Foreword

The World Bank's 2004 Water Resources Sector Strategy advocated a re-engagement in "high risk and high reward" water infrastructure, based on a better understanding of the vulnerabilities of poor nations to climate variability and climate change, an improved understanding of the role of water in growth and poverty alleviation, lessons learned from the World Commission on Dams, the global experience in Integrated Water Resources Management (IWRM) implementation, and the Bank's experience on water and environmental issues. In spite of this Strategy's support for the principles of IWRM, it was becoming clear that there was limited implementation of IWRM in practice (especially with respect to environmental sustainability) in developing countries.

The establishment of the Sustainable Development Network (SDN) has further elevated the Bank's commitment to environmental responsibility. SDN promotes the mainstreaming of the environment and entrenches environmental sustainability as a core element of the Bank's work. To realize its goals, greater emphasis will need to be placed on mainstreaming the environment into upstream processes such as policy, programs, and sector-wide investment dialogue.

In its 2001 Environment Strategy, the Bank committed to use strategic environmental assessments (SEA) to address environmental concerns at the strategic levels of

decision making—policies, legislation, strategies, plans, and programs. SEA is also a process for improving public policy design and good governance of natural resources (Ahmed and Sanchez-Triana, 2008). This report highlights the opportunities offered by SEAs for addressing not only the problems that arise when environmental considerations are delayed until project stage, but for improving the inclusion of environmental considerations into IWRM practice.

The report analyzes 10 global case studies of SEAs in the water sector, four national and state water policies, and an in-depth pilot case study of water reform in a developing country (Tanzania). This analysis shows SEA implementation promotes some important IWRM objectives. In short, this alternative route to introducing environmental considerations into strategic water resources decision-making may help overcome the impediments that IWRM has faced in moving from the policy level into practice.

The report was prepared as a collaborative effort of two SDN Departments—the Environment Department and the Energy, Transport and Water Department—of the World Bank. It recommends a framework for expanding use of SEAs for mainstreaming environmental considerations in water resources policy, legislative and institutional reforms, planning, and investment decision-making.

James Warren Evans
Director
Environment Department

Jamal Saghir
Director
Energy, Transport and Water Department

Executive Summary¹

The overall goal of this report is to help water resources and environment professionals within the Bank and client countries use SEAs to effectively implement the principles of IWRM. The report contains four elements: (1) a review of SEA support for IWRM, (2) an analysis of 10 case studies and four water policies, (3) an in-depth pilot study of water sector reform in a developing country, and (4) a framework for enhancing the use of SEAs in integrated water resources management. The main findings of these elements are summarized below.

SEA Support for IWRM

Integrated water resources management (IWRM) has been the accepted paradigm for efficient, equitable, and sustainable management of water resources since the 1990s. It recognizes the dual relationship between the environment and water resources. The environment is both a water-using sector (as in a National Park or a habitat for fish or other species) and the resource base (wetlands, watershed, and recharge area) a provider of ecological and hydrological services that maintain the water resources in a fit state for all sectors. The GWP promotes IWRM as a process for improving water governance and management.

The World Bank has embraced IWRM as a framework for implementing its 2004 Water Resources Sector Strategy and re-engaging in high risk/high reward water infrastructure in an environmentally responsible manner (World Bank 2004). Developing nations have increasingly accepted IWRM at the national policy and strategy levels. However, the evidence indicates that

it is not being put into practice in a comprehensive way. Typically, elements of IWRM are implemented independently to suit requirements. Because of this the Water Resources Sector Strategy suggests that “principled pragmatism” be used in implementing IWRM. Even where some IWRM elements are being implemented, there is little evidence that IWRM adequately incorporates environmental sustainability.

Strategic environmental assessment (SEA) is an environmental planning tool for improving decision making at the strategic level of policies, legislation, strategies, plans, and programs (PLSPP). SEAs include a range of instruments that assess the potential impacts of PLSPPs and the institutional capacity to integrate environmental, social and economic considerations and good governance. Relatively few SEAs have been applied in the water sector, and few regions have introduced systematic procedures for conducting SEAs in the water sector.

Because IWRM and SEAs share many concepts and characteristics, SEAs potentially offer a complementary tool to IWRM to introduce and integrate environmental considerations into water resources policy, planning, and management, and thereby support IWRM. SEAs offer these opportunities at many levels—developing a national or sector water policy, enacting water legislation, drawing up river basin

¹ This common executive summary covers the main report (published separately) and case studies (this report) for the analysis titled, “Strategic Environmental Assessment: Improving Water Resources Governance and Decision Making.” From hereon, the term “report” refers to both the main report and case studies.

plans, establishing a river basin institution, formulating and implementing a national water supply, irrigation or energy master plan, identifying hydropower, urban water supply or irrigation investment options, supporting transboundary water resources management and development, or instituting and implementing sectoral strategies or programs.

SEA Case Studies and Water Policies

This second section describes an analysis of institutional drivers and the procedural and substantive factors that promoted success in SEA. Ten geographically diverse case studies were selected for analysis from a diversity of sectors and different decision levels—strategy, program, and plan levels. Seven were from Bank-funded projects². The three non-Bank cases were from Australia, Czech Republic, and South Africa

Institutional drivers of SEAs

No judicial drivers were used in the case studies, while procedural (e.g. legislative requirements) and evaluative (i.e. oversighting institution) drivers were used infrequently. Instrumental drivers, such as recommendations from external institutions such as the World Bank were commonly relevant although they were often used voluntarily rather than as formal requirements. Professional drivers were often important, and public pressure was also a significant factor. There were multiple drivers for all case studies. Procedural drivers were not effective unless accompanied by public pressure or strong evaluative drivers.

There were a number of cases where SEAs were initiated, not from the six types of drivers, but because of a belief by government or institutions that it was the correct approach to take. These instances were usually encouraged and supported by a development partner. Trust between the development partner and the government was an important factor when the governments were venturing into new procedures.

Procedural factors

Several lessons about analytic procedures were noted. First, the terms of reference must be clear and well formulated for the SEA to be influential. Second, the SEA team composition needs to be balanced between the sectors contributing to the study, and the team leader needs to have a breadth of understanding of the inter-connections between economic, social, and environmental factors. Third, the assessment methods need to be suited to the characteristics of the issues.

Consultation is essential but does not always need to be widespread; however, it is important to include the stakeholders who will be affected by the decision. The consultation and participation process should be planned to ensure that participants are well briefed and are involved at the appropriate stages of the process.

The spatial scale of the SEA matters. If the area is large, appropriate tools need to be used to conceptualize problems and to engage all stakeholders.

SEAs can span strategic scales. Institution-centered SEAs typically examine the capacities of institutions, the relevance and consistency of policies and legislation, mechanisms to involve vulnerable groups, and political economy factors that affect the implementation of plans and programs that trigger the SEAs.

Substantive factors

The process of interacting with different stakeholders, examining causative influences and longer term consequences, and integrating environmental, social, and economic considerations is as important as the

²Water and Sanitation Sector SEA, Colombia; Rapid Water Resources Assessment, Tanzania; SecEA of Hydropower Development Program, Kingdom of Nepal; SEA of Water Resources Sector Adjustment Loan, Republic of Indonesia; SEA of Palar Basin, India; SIA and CEA of Nam Theun II Hydropower Project, Republic of Laos; and Transboundary Diagnostic Analysis/Strategic Action Program, Lake Victoria Basin, East Africa.

output from the SEA study. This process should commence as early in the preparation of the PLSPP as possible and continue after the study has been completed.

The most effective case studies brought fundamental changes in national policies, laws and institutions. They were undertaken at opportune times when there was political receptivity to change. In some cases, economic arguments played a key role. However, these changes usually took many years. Development partners and the governments needed to stay committed over this extended period.

SEAs need not be environment-led. Some effective SEAs were primarily driven by factors other than the environment, although environmental sustainability played an important role.

Some successful SEAs led to water policy reforms and full implementation of water-related programs such as the establishment of river basin institutions.

Effective SEAs were often relatively cheap, costing less than \$100,000.

Lessons from water policies

No SEA case studies of water policy were identified. To fill this gap, water policies of three nations (South Africa, Tanzania, and India) and one state (Victoria, Australia) were examined for their inclusion of environmental considerations. All four policies recognized the legitimacy of water for the environment, but the level of detail and commitment to implementing this recognition varied significantly. The Indian policy mentioned criteria for this but provided no detail. The South African and Tanzanian policies devoted greater attention to environmental considerations. The Victorian policy stood out because it was entirely based on the concept of environmental sustainability.

Lessons on SEA Support for IWRM

The major principles of IWRM are: multisectoral water management, participation, and use of economic instruments. The case studies illustrated how the SEAs had contributed to all three principles.

Multisectoral water management

Two cases explicitly contributed to implementing this principle. All cases raised environmental sustainability questions. A number of SEAs were undertaken by multisectoral task forces, potentially contributing to a multisectoral approach to water resources management. All but one case study considered multisectoral impacts.

Some SEAs had long-term influence in supporting integrative approaches to water sector management. The Tanzanian RWRA study catalyzed changes in policy and legislation that have subsequently supported multisectoral approaches. The Palar Basin SEA led to a rollout of water resources SEA studies across Tamil Nadu, India. The Colombia WSS SEA led to progressive water sector reforms and multisectoral involvement.

Participative management

Some institutions, initially skeptical of stakeholder involvement, became advocates of increased stakeholder participation as a result of their experiences during the SEA. In two cases, this interest led to legislative requirements for public participation. These outcomes of the SEAs contributed to improved public governance. A number of the SEAs contributed to decentralization of water resources institutions and the establishment or strengthening of participative river basin institutions.

Economic instruments

The SEAs did little to encourage the use of economic instruments, although one advocated charges to

control water use and the discharge of pollution, and another advocated permits for fishing and its export, in order to provide a source of finance for water resources operations. There was no attention to demand management. One case study was focused on improving private sector investment, including a revision of and adoption of less stringent and more defensible water quality standards.

In-Depth Pilot Study of Water Sector Reforms in Tanzania³

An in-depth water sector reform pilot study on Tanzania complemented the analysis of global case studies and water policies. A series of water sector crises in the 1990s, many of which contained environmental aspects, brought home to water resources managers the need to implement the principles of IWRM, particularly multisectoral management, decentralized decision making, stakeholder participation, and inclusion of environmental water requirements. These principles were embodied in the 2002 Tanzanian National Water Policy. Six water-related SEAs had already been carried out within the evolving institutional environment of Tanzania, even before the 2004 environmental legislation required SEAs — the water and energy sectors are identified as two of four priority sectors in the legislation.

More recent experience in Tanzania has shown that it is not sufficient to have just the water sector sensitized to environmental issues and to have legislative requirements for SEAs. Other water-using sectors (e.g., energy, agriculture, livestock, etc.) also need to reform and harmonize their policies, legislation, and strategies if these advances in water sector management are to be effective. SEAs would be suitable instruments for coordinating these changes across sectors.

³ This section is based on a full chapter of the main report.

A Framework for Expanding the Use of SEAs for IWRM

An important part of the SEA should be focused on assessing the underlying institutional and governance factors. This is important because policy and institutional changes take time and are typically driven by incremental changes in behavior and incentives. Assessing institutional factors helps to better understand, design and incorporate these aspects in the eventual SEA recommendations.

Given the wide range of strategic levels of decision making—policies, legislation, strategies, plans, and programs it is not sensible to have a single, all encompassing template for conducting SEAs for use by Bank operations staff. Appendix C (of the Main Report) provides a range of possible environmental aspects that could be included in the terms of reference (TORs) for an SEA for water resources PLSPPs. SEAs can also be used to examine sectoral policies and laws for consistency with water resources and support for environmental considerations, and the capacity within a country for recognizing and managing water related environmental issues.

A framework for the Bank to expand the use of SEAs to mainstream environmental concerns into water resources management could consist of four parts:

- *Bridge disciplinary perspectives.* Environmental and water resources professionals could widen their understanding so that the compatibilities between their disciplinary terminology, techniques, and approaches are fully understood, appreciated, and exploited.
- *Establish an enabling environment.* An enabling environment should be developed where sectoral policies are harmonized to (a) mutually support IWRM principles, including environmental protection; (b) undertake SEAs where appropriate; (c) allow a range of SEA types to be used to meet different needs; and (d) promote stakeholder participation in SEAs. Transboundary SEAs

require a mutually agreed plan of action and should be overseen by a high-level committee (UNECE 2003). The Bank can help develop this enabling environment by using its influence and knowledge to help introduce SEAs and build up experience.

- *Build capacity.* To ensure that SEAs are properly supported, an understanding needs to be developed, particularly among senior decision makers, of the benefits of SEAs. It is also

important for staff from sectoral institutions to know how to work in multi-disciplinary teams to conduct SEAs. Good quality water resources data is needed to underpin SEAs in this sector.

- *SEAs need to be well planned.* Experienced team leaders should be able to deal with the diversity of sectoral issues arising in IWRM; TORs should be clear; analytical procedures should be suited to the problem; and the stakeholder participation should be carefully planned.

Section A: Case Studies of SEAs in the Water Sector

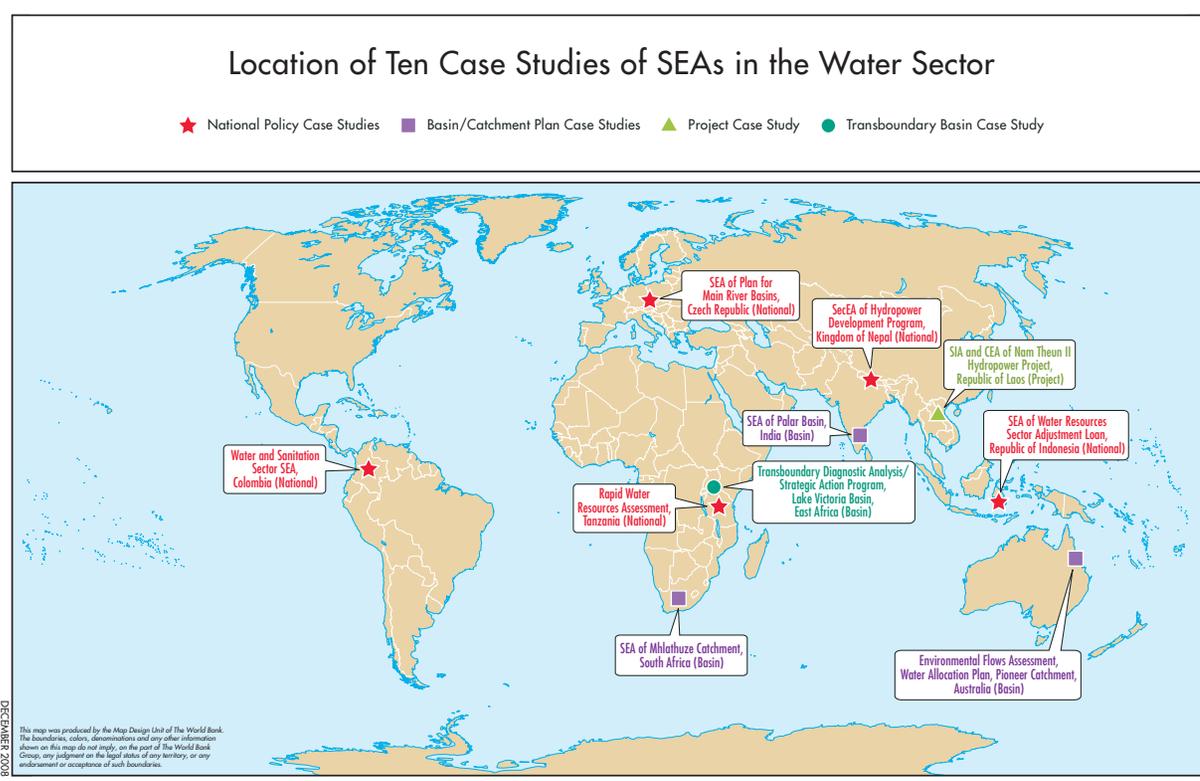
Overview of Case Studies and Assessment Method

Case Study Selection

All Bank-funded SEA and SEA-type studies in the water sector were scanned, and those undertaken since 1995 with good documentation in English and staff available for interview were selected. Multiple examples of the same type of study (e.g. GEF TDAs/SAPs) were dropped. Attempts were made to balance sectoral and geographical coverage. CWRASs were examined

separately. A total of 10 case studies were selected (see Map 1). These were six Bank-funded case studies (including a Bank-implemented GEF project) and one study funded by the Asian Development Bank and the World Bank. These were supplemented by a water-sector strategic study from a developed country (Australia), one from a country in economic transition (Czech Republic), and one from a developing country (South Africa).

Map 1. The 10 SEA case studies analyzed in this report.



There were no SEAs of water resources policies, although some strategy and program SEAs examined national policies, legislation, and regulations.

Impact and institution-centered SEAs occurred at both the program and strategy levels. The only SEA at the plan level considered only biophysical impacts of development scenarios. The Nam Thuen II SEAs⁴ were unusual in that they were part of the environmental assessments for a specific project. Although project-specific, they have been included as program SEAs, since these particular studies examined the sustainability of programs of development beyond the hydropower plant itself.

The case studies (Table A.1) illustrate the diversity of origins, sectors, purposes, and methods for the SEAs. The SEAs covered spatial scales from small catchments to large transboundary regions. The Lake Victoria Environmental Management Project Phase II (LVEMP-II) TDA/SAP was the only case study that was fully transboundary in nature, although the Nam Theun II SIA also looked at proposed sectoral developments within countries bordering Laos and their strategic implications for the proposed Nam Theun II development. SEAs cannot always be assigned easily to a particular strategic level. Although the Colombia SEA was initiated to support a national sectoral program, it examined the adequacy of specific sectoral policies and legislation.

These case studies illustrate how SEAs can serve diverse purposes (OECD 2006). Two of the 10 SEAs (Czech Republic, Nam Theun II) were established to assess the potential social and environmental impacts of a specific draft instrument—an impact-centered SEA—and two more (Indonesia WATSAL and Colombia WSS) assessed the institutional structures within which a proposed program was to operate—institution-centered SEAs. The other six SEAs were undertaken before a specific instrument had been formulated. Three—the Pioneer and Mhlathuze catchment studies and the Lake Victoria TDA/SAP—were used to provide information for a plan, program, or strategy about to be developed (the

Mhlathuze SEA had a second objective—to explore the potential of SEAs for catchment water allocation planning across South Africa). The remaining three SEAs—Nepal Hydropower SEA, Tanzanian RWRA, and Palar Basin SEA—were not used to either assess draft instruments or to provide specific environmental input into a new instrument about to be developed. Instead their purpose was to better understand, clarify and structure complex situations and develop a framework for action.

The SEAs also diverged considerably between those that relied on formal analytical methods and those that relied on participative methods. For example, the Pioneer Catchment study used a rigorous analytical procedure, the Benchmark methodology, to assess environmental flow needs. It was conducted as a scientific exercise with no stakeholder input. The Tanzanian RWRA study used existing regional water master plans, a national energy master plan, a national irrigation master plan, and other data and information, coupled with the judgment of 11 professionals from several government ministries to identify priority sectoral issues and river and lake basins requiring priority action. The WATSAL SEA, on the other hand, relied upon stakeholder input to formulate its recommendations. Some studies combined analytical and stakeholder-driven approaches. The Nepal Hydropower SEA used a formal screening and ranking methodology to identify the most promising options in a power development program, but used stakeholder input to establish the suite of hydropower sites to be assessed, the criteria to be used for the assessment, and the weights to be given to the different criteria.

The Pioneer Catchment was the only study that was restricted to environmental issues; the rest integrated environmental issues with development and management needs related to other water using sectors. All the other studies included social issues (health

⁴ Both a cumulative impact assessment (CEA) and a strategic impact assessment (SIA) were undertaken for the Nam Thuen II project.

Table A.1. Characteristics of Ten Case Studies of SEAs in the Water Sector

Number	Case Study	Sector and sub-sector	Strategic Level	Purpose ¹	Scale
1	Water and Sanitation Sector SEA, Colombia	Water Supply and Sanitation • urban and rural water supply • wastewater treatment	Program	Assessment	National
2	Rapid Water Resources Assessment, Tanzania	Water Resources • urban and rural water supply • hydropower (Energy) • irrigation (Agriculture) • environment (Fisheries, Wetlands)	Strategy	Structuring	National
3	SEA of Plan for Main River Basins, Czech Republic	Water Resources • flooding • water allocation • wastewater treatment	Strategy	Assessment	National
4	SecEA of Hydropower Development Program, Kingdom of Nepal	Energy • hydropower • catchment protection • environmental water	Program	Structuring	National
5	SEA of Water Resources Sector Adjustment Loan, Republic of Indonesia	Water Resources • flooding • catchment degradation • urban and rural water supply • irrigation • environmental water	Program	Assessment	National
6	Environmental Flows Assessment, Water Allocation Plan, Pioneer Catchment, Australia	Environment • biodiversity • irrigation	Plan	Information	Basin
7	SEA of Mhlathuze Catchment, South Africa	Water Resources • rural water supply • forestry • irrigation • industry	Plan	Information	Basin
8	SEA of Palar Basin, India	Water Resources • urban and rural water supply • urban wastewater • industrial wastewater	Strategy	Structuring	Basin
9	SIA and CEA of Nam Theun II Hydropower Project, Republic of Laos	Energy • hydropower • irrigation • flood protection • urban and rural water supply • fisheries • industry	Program	Assessment	Regional
10	Transboundary Diagnostic Analysis/Strategic Action Program, Lake Victoria Basin, East Africa	Water resources • catchment protection • fisheries • transport • urban and rural water supply • hydropower • tourism	Strategy	Information	Trans-boundary

Note 1: "Assessment" means the SEA assessed either environmental impacts (impact-centered) or environmental capacity (institution-centered); "information provision" means the SEA preceded the PLSP and was used to provide environmental information for it; "structuring" means the SEA was used to structure a complex situation.

issues in the case of the Czech Republic SEA) and two (Nepal Hydropower study, Colombia WSS study) included explicit financial/economic considerations in their assessment of issues and recommendations for sustainable options.

Analytical Method

The case studies were analyzed to identify their institutional drivers and to assess the extent to which they met the procedural and substantive criteria proposed by IAIA. This analysis provided insights into the factors that made some SEA studies successful and the circumstances in which the success occurred.

The analysis was based on both documentation and interviews. Documentation was initially obtained from published sources, including the archives in the case of the Bank-led case studies. Interviews were then arranged with the team leaders of the projects where these were available and with other team members where the team leader was not available. The interviews were either in person or by telephone. The interviews particularly focused on the motivations for the study and its subsequent influence, since this information was seldom documented. Additional documentation was collected during these interviews.

Case Study 1. SEA for Water Supply/ Sanitation Reform in Colombia

Background⁵

Colombia has achieved high levels of water supply and sanitation (WSS) service connection, with approximately 44 percent and 25 percent of the rural population connected to water supply and public sewerage or septic tanks in 1997 respectively. At that time, 84 percent of the urban population was connected to water supplies and about 75 percent had sewage connections. By 2000, urban coverage rates had reached 90 percent and 85 percent for water supply and sewage, respectively. However, the good coverage rates mask shortcomings in the quality of service. Water rationing and intermittent supplies are common in most water supply systems; only slightly less than 50 percent of all drinking water is treated; there is insufficient pressure in the water supply systems, adding to the risk of bacterial contamination; sewage collection systems do not have sufficient hydraulic capacity to handle wastewater flows; and only about 5 percent of wastewater receives any kind of treatment. In addition, private sector participation (PSP) in the water sector is lower than anticipated. The reasons for the slower than expected spread of PSP are twofold: (1) security problems in the country deter foreign operators and investors; and (2) carrying out PSP processes is complex and difficult and discourages PSP.⁶

Under the 1991 constitution, municipalities have the responsibility for providing WSS services. The constitution provides the legal framework for reforms in the water sector by clearly separating service provision and policy making, and by allowing PSP in the infrastructure sector. By 2000, private sector

involvement in large and some medium-sized cities had resulted in an expansion of coverage, increases in service continuity, and more efficient utility management. However, the reforms did not extend to smaller cities and rural areas. Furthermore, the sector's regulatory framework remained inadequate, often constituted an obstacle to further investment, and neglected the sector's social and environmental considerations.

In 2000, the Government of Colombia prepared a project proposal for the World Bank to help increase private service involvement in WSS services in medium-sized cities and smaller municipalities, and to improve the financial sustainability of utilities where the private sector had already become involved. Given the issues facing the WSS sector and following earlier experience in Argentina, the Bank suggested that an SEA be undertaken as part of the project preparation.

The SEA Study

The SEA was undertaken by a team of consultants with backgrounds in engineering, economics, and law. The Ministry of Economic Development, responsible for

⁵This case study draws heavily from Sánchez-Triana E. and S. Enríquez. 2005. "Using Strategic Environmental Assessments for Environmental Mainstreaming in the Water and Sanitation Sector: The Cases of Argentina and Colombia." Sustainable Development Working Paper No. 26. Latin America and Caribbean Region, Environmentally and Socially Sustainable Development Department. Washington, DC: World Bank.

⁶World Bank. 2001. "Colombia Water Sector Reform Assistance Project, Project Appraisal Document." Washington, DC: World Bank.

water supply and sanitation services, and the Ministry of Environment formed an advisory committee that would set the sector's priorities, oversee the implementation of agreed solutions, build consensus on environmental aspects, and address emerging issues. The SEA focused on the deterioration of water quality and inefficient water use associated with WSS, and on the impacts that would be associated with the works to be financed under the proposed project.

Based on the earlier experiences in Argentina, the team realized that the institutional impediments to improvements in WSS services, including the reluctance of the private sector to invest outside of major metropolitan areas, would not be uncovered using a conventional impact-centered SEA. Instead, the SEA would need to investigate the policy environment and the way in which its application by government institutions affected the decisions of the private sector. This required an analysis of the positions, interests, and interrelations of decision makers and other relevant actors. Solutions would need to take account of the realities of the political environment, including the decision-makers' political or normative views, realistic opportunities for environmental mainstreaming, the degree of support that could be raised among different stakeholders, and the country's capacity to implement changes. Not all policy problems can be fixed at a stroke, and reforms need to be supported through ongoing dialogue between governments and development partners.

The study found that three regulatory instruments—cumbersome procedures for obtaining environmental licenses, poorly designed pollution charges, and high and inappropriate environmental standards that required large tariff increases—discouraged private sector involvement and hindered the expansion of WSS coverage. In addition, municipalities lacked the technical capacity to develop proposals for PSP that were attractive to the private sector.

There were also serious deficiencies in national institutions. The Ministry of Economic Development

was oriented toward the execution of specific investment projects, and environmental, economic, and social aspects of water were neglected. The regulatory framework developed by the Drinking Water and Basic Sanitation Regulatory Commission was too intrusive, and subsidies distorted financial performance. And the Public Service Superintendence, which supervised legal compliance, was unable to supervise utilities, which numbered over 1,700 and had very heterogeneous characteristics.

The SEA recommended that policy reforms were needed. These included modifications to water pollution charges and wastewater discharge standards, and corrections to the deficiencies associated with EIA regulations, with the aim of reducing the legal uncertainty generated by environmental regulations and attracting private investment. The proposal included mechanisms to streamline and improve project assessment, including environmental impact assessment and public participation, and to strengthen the environmental capacities of the Ministry of Economic Development, the municipalities, and the water utility operators. The consultants provided recommendations to improve transparency and accountability and the ability of the Ministry of Environment to oversee the implementation of national policies in regional jurisdictions.

The SEA recommendations were accepted by the Ministries of Economic Development and Environment, albeit reluctantly by the latter ministry. Both ministries agreed to work jointly to implement the SEA action plan, harmonize existing legislation, streamline environmental license processes for water projects, evaluate and mitigate environmental risks in operational contracts, and involve the relevant authorities in developing new tariff schemes that would incorporate well-defined environmental charges. As a result of the SEA, the World-Bank-funded project included an environmental component that contained some of the SEA's recommendations. However, the reforms did not sufficiently reduce barriers for private

investment. For instance, the modifications introduced to the pollution charges were superficial. Critical aspects, such as the selection of the charged pollutants and the methodology for setting abatement goals, remained untouched.

However, the Bank and the government continued to discuss the SEA recommendations. The assessment for a subsequent investment loan⁷ used the SEA, and a DPL for sustainable development⁸ included several of the SEA recommendations such as the amendment of the environmental license system and preparation for a new water resources management law. A second DPL is in the pipeline, and a third is envisaged to further reforms to Colombia's environment and water sectors.

This case study provides a benchmark example of an institution-centered SEA that was conducted independently of the policies being assessed and that was highly influential in improving environmental performance in the water sector.

Institutional Drivers

The SEA study was primarily driven by the Bank's positive experience with an earlier SEA for a WSS investment loan in Argentina (an instrumental driver). And the Bank's standing and leverage in Colombia persuaded the two principal ministries to participate. The Ministry of Economic Development did not want to undertake any more investigations than strictly necessary to comply with the World Bank requirements and agreed to participate when assured that the study would take only a few months. The Ministry of Environment participated reluctantly because the Ministry of Economic Development's interest in the study was seen as an intrusion onto their (Environment Ministry) territory.

As the study progressed, the ministries became more supportive. The Ministry of Economic Development accepted the report's conclusions, but the suggested environmental regulatory modifications faced strong

resistance from stakeholders within the environmental sector, who initially limited the scope of the proposed reforms.⁹ However, the reforms are continuing to progress as dialogue continues, largely as a result of a strong coalition of institutional supporters built up by the SEA report. Being able to quantify the economic cost of poor-quality WSS services was an important element in gaining influence, as was being sensitive to the political economies of the reforms and accepting that not all reforms could be carried out immediately.

Although the new environmental legislation is not yet drafted, it may include provisions for SEAs such as the study described here, to be carried out on other policy and strategy proposals and so shift the current reliance on instrumental drivers to national legislative drivers.

Process Competence

Accountable. The Ministry of Economic Development was clearly the client for the SEA study and, once they saw the preliminary findings, they became active champions of the process and advocated the adoption of many of the recommended actions. The study was undertaken professionally and competently by the consultants within the limited time available. While the study was assessed by the government institutions, it was not subjected to an independent verification.

Participative. Two nationwide workshops were organized during the study: the first to collect stakeholder perspectives on the scope of the assessment, and the second to present an advanced draft of the report and solicit additional comments. The SEA team

⁷ World Bank. 2005. "Water and Sanitation Sector Support Project in Support of the First Phase of the Water and Sanitation Sector Support Program." Project Appraisal Document. Washington, DC: World Bank.

⁸ World Bank. 2005. "Programmatic Development Policy Loan for Sustainable Development." Project Document. Washington, DC: World Bank.

⁹ See Sánchez-Triana and Enríquez (2005).

attempted to incorporate the perspectives of vulnerable groups by identifying the sector’s environmental impacts that clearly affected them. In addition, the Ministries of Economic Development and Environment held consultations with government agencies, private utility operators, academics, professional associations, NGOs, and public defense groups to build consensus around the SEA report. The two major ministries were kept informed of progress and assessed preliminary findings as the study progressed.

Iterative. The study was designed to be available in time to influence the preparation of the project and, in fact, a component of the project was devoted to implementing some of the SEA recommendations. The SEA report continued to influence government dialogue with the Bank to the point where the structural recommendations were implemented through three programmatic DPLs intended to help reform the policy and management of the environment and water sectors. The SEA study documented its findings and cast them in terms that were relevant to decision makers—in economic and financial terms, in terms of meeting MDGs, and with a recognition of the political realities operating at the time.

Substantive Competence

Integrated. The study went to the fundamental reasons—technical, legal, institutional—for the poor performance of existing WSS operations and the limited involvement of the private sector. It linked environmental performance to social and health issues and, where possible, put these issues in financial terms. The study was vertically integrated in that it linked outdated and limited policies and legislation to the poor performance of the utilities and the regulatory institutions and, ultimately, to the inadequate service received by consumers and limited coverage of WSS services in medium-sized cities and rural areas.

Sustainability-led. The major outcome of the SEA study was the development of a plan of institutional

and technical reforms that would place water sector management on a more sustainable basis and improve aspects of environmental oversight of water sector investments and operations.

Focused. The study focused on the root causes of the difficulties faced by the WSS sector and collated persuasive evidence about the causes of these problems. The issues it focused on—WSS coverage for those outside major cities, improved service, health issues, environmental safety for poorer sections of society—are at the heart of sustainable development and the MDGs. The SEA study took 3 months to complete (although discussions on the recommendations continued for some years) and cost approximately \$28,000. Given the far reaching changes triggered by the report and the potential environmental and WSS benefits, this represents an excellent rate of return.

Influential. The influence of the SEA was far-reaching but not immediate. It engendered debate among stakeholders in the water and environment sectors and led to progressive changes to the legal and regulatory systems, environmental assessment and management, and participative processes; in turn, this improved the enabling environment for private sector investment in the water industry. These were supported by a series of World Bank investment and development policy loans.

Lessons Learned

This SEA provides important lessons on the usage of SEA rather than on the technical aspects of conducting them. It turned around the usual approach—“How does this policy affect the environment?”—to ask “How do the environmental standards and procedures impede both development policies and environmental protection?” It illustrates how an environmental instrument can be used to further development and poverty alleviation as well as environmental protection by putting its findings and recommendations in terms that are meaningful to politicians and senior decision makers. This includes use of economic and financial

arguments and linkages to national goals such as poverty reduction and MDGs. While this approach led to a reduction in the stringency of environmental standards, it also made them more relevant and acceptable. The assumption was that it was better to have standards that industry regarded as relevant and achievable than ones that were widely ignored as being irrelevant and unachievable.

It also illustrates the importance of building support among a wider constituency than just the lead agency

and working patiently over a number of years to implement reforms. The influence of an SEA can be felt a number of years as opportunities arise to implement components of a reform program.

Finally, it clearly illustrates that an SEA need not be costly or time consuming to be influential if it is focused on the core questions, builds a constituency, and presents its findings in a way that is relevant to decision makers.

Case Study 2. Rapid Water Resources Assessment, Tanzania

Background

Tanzania's early post-independence period was focused on the development of rural and urban water supplies with the goal of access to safe water for all citizens by 1991. The Water Utilization and Control Act (1974) and subsequent amendments provided the legal framework for the sector, including water allocation, water pollution control, water user charges, water quality standards, and river basin water offices. Water was treated as a free good, planned centrally by the ministry responsible for water and delivered through regional water engineers, who reported to the ministry. Seventeen of Tanzania's 20 regions had a water master plan, which focused on the engineering and development aspects of rural and urban water supply.

A review in 1993¹⁰ of the water supply and sanitation program showed that, after nearly 20 years, water supply coverage remained low, with only 42 percent of the rural and 54 percent of the urban population having access to safe and potable water supply. Not only was coverage low, but the quality of service was also deficient. Shortage of water coupled with inadequate sanitation facilities and sewerage systems and solid waste disposal facilities has led to increasing environmental pollution and health hazards. The reasons for this poor performance included non-involvement of the beneficiaries, inappropriate technologies, and continued centralization. In response, the government adopted a National Water Policy in 1991 that placed emphasis on community participation, decentralized management, use of appropriate technologies, cost sharing for rural water

supply, and cost recovery for urban water supply. However, the policy focused on development aspects of the water and placed little emphasis on conservation and management of the water resource itself.

Apart from the difficulties with water supply and sanitation, there were growing water use conflicts in the Pangani and Rufiji river basins, where most of Tanzania's irrigated agriculture and hydropower generation is concentrated. Small-scale conflicts occurred between farmers upstream and downstream of one another. On a larger scale, there were conflicts between the agriculture and hydropower sectors because irrigation takes place upstream of hydropower plants in the Rufiji and Pangani basins, and is poorly regulated and controlled. In the Pangani basin, the construction of the New Pangani Falls Development was under threat from a serious water shortage even before its construction had been completed. This prompted the Norwegian Government, the primary funding source, to reconsider supporting the power sector in Tanzania. There were also conflicts between irrigation and environment and hydropower and environment in the Ruaha Basin, and these had generated national and international attention.

Each of the three major sectoral water users—water supply/sanitation, agriculture, and hydropower—had formulated their water use plans independently, and there was no integration between the plans. None of

¹⁰Njau, F.Z. 1994. "Tanzania's Water Sector Review Process." In Rafik Hirji and Francois-Marie Patorni (eds.). *Proceedings of the Seminar on Water Resources in Tanzania*. Washington, DC: World Bank.

the plans addressed water use for the environment, even though the environment (through sectors such as fisheries and natural resources) contributes substantially to the national economy and livelihoods of many Tanzanians.

Consequently, it was recognized that an integrated water resources management strategy needed to be developed to guide both the medium- and long-term development and management plans for the water sector. The strategy would need to encourage cooperation among different ministries and institutions and be environmentally sustainable.

The Rapid Water Resources Assessment

A three-phased approach was used to develop and implement the IWRM strategy. The first phase, in conjunction with the water supply and sanitation review, was initiated by a Rapid Water Resources Assessment (RWRA) focusing on water resources to identify the issues and to develop an action plan. The RWRA commenced early in 1994, with technical and financial support from DANIDA and the World Bank.¹¹ Its objectives were:

- To integrate hydrological considerations, cross-sectoral water uses, land use, water quantity, and environmental and public aspects in water and sanitation
- To inventory and analyze existing information to assess surface water and subsurface water availability and sectoral land and water, including environmental issues
- To establish national and basin-wide priority issues on river basin management and the formulation of strategies that will address those issues

The RWRA¹² was undertaken as a desk study based on the regional water master plans, national energy and irrigation plans, and other cross-sectoral information (including information on hydrology, health, wetlands, and pollution). It was carried out for the Ministry of

Water, Energy, and Minerals. It was implemented by an inter-disciplinary and multisectoral team led by the Ministry of Water, and with staff from the Ministries of Agriculture, Environment, Forestry, Natural Resources, and Health.

The RWRA concluded that, across the country, there was adequate water available for the foreseeable future although there were potentially water shortages and emerging conflicts over water use in specific parts of some river basins. However, there were serious issues arising from inadequate water supply and sanitation in both urban and rural areas, inadequate enforcement of water rights, lack of control over water pollution, degradation of aquatic ecosystems, weak water management institutions, lack of policy on shared watercourses, inefficient water use in the irrigation subsector, conflicts between water users in stressed basins, and outdated legislation controlling water resources. The RWRA also found serious inadequacies in inter-sectoral coordination of water use and management, limited representation of stakeholders in decision making, insufficient incentives for efficient water use, occurrences of serious water pollution, and very limited data on which rational allocation decisions could be based.

At the basin level, the RWRA identified four out of the nine basins as priority basins requiring urgent action. The Rufiji and Pangani basins faced serious water allocation problems and acute water use conflicts, the Wami-Ruvu Basin faced problems over unregulated supply and growing needs for Dar es Salaam water supply, while the Lake Victoria Basin experienced serious environmental degradation due to increasing pollution, wetlands degradation, overfishing, and increasing watershed degradation.

¹¹ The World Bank's 1993 Water Resources Management Policy Paper provided a framework to guide these reforms.

¹² Ministry of Water, Energy and Minerals, United Republic of Tanzania. 1994. "Rapid Water Resources Assessment Report." Dar es Salaam, Tanzania: Ministry of Water, Energy, and Minerals.

The RWRA recommended that introduction of an integrated approach to water resources management be implemented in two subsequent phases—initially to support policy, legal, and institutional reforms at the national level and management actions in the priority river basins (Rufiji, Pangani, Ruvu-Wami and Lake Victoria basins), and subsequently throughout the country. The priority tasks at river basin level were:

- Rufiji Basin – a comprehensive water resources management plan, including watershed management
- Pangani Basin – a comprehensive water resources management plan, including watershed management, a water quality and pollution monitoring program, and incentives for groundwater development
- Ruvu/Wami Basin – a comprehensive water resources management plan that makes the water supply for Dar es Salaam a priority
- Lake Victoria Basin – a detailed survey of pollution sources and abatement proposals, a plan on the utilization of Lake Victoria waters, and a water quality monitoring program

The recommendations of the review were accepted by the Government of Tanzania and subsequently implemented through a series of projects supported by the World Bank and bilateral donors. The national water policy was revised in 2002; new water resources legislation was drafted; water sector institutions are presently being restructured; the existing three river basin offices were strengthened, and the remaining six basin water offices have been established; irrigation efficiency has been improved in 15 rehabilitated pilot irrigation schemes; water supply and sanitation services have been improved in eight urban towns and 13 districts; and transboundary water management has been initiated in the Lake Victoria and Lake Tanganyika basins and in the Ruvuma River Basin. A new \$951 million water sector support program¹³ has recently been initiated to consolidate and extend these water management improvements across the country,

including in all urban areas, all districts, and in all nine river and lake basins.

The RWRA was primarily an institution-centered SEA with a focus on the underlying policy and institutional reasons for the poor performance of the water supply and sanitation program, the conflict over access to water, and the broader water resources challenges. Its purpose was to structure a water development and conservation strategy to be implemented over the subsequent decade.

Institutional Drivers

The World Bank assisted the government in the design of the RWRA, but there was no procedural or instrumental driver for the study. Rather, the primary drivers for the study were a combination of local and external factors. The RWRA was conceived at a time when local awareness on water resources issues was heightened because of the nation-wide drought and water crises in the Pangani and Rufiji basins, which impacted many key sectors of the economy and livelihoods of the people. In addition, Tanzanian professionals, through participation in major global meetings, became aware of the growing international consensus on responding to water resources challenges, such as those facing their nation. In 1993, the World Bank had issued its Water Resources Management Policy calling for a more holistic approach to the management of water resources. The conclusion of the 1993 World Bank mission for the National Environment Action Plan was that it was more important to first address the water resources issues and challenges before focusing on just the environmental aspects of water resources. As a consequence, environmental issues were integrated into the RWRA. There was thus a meeting of professional minds among the Tanzanian experts and World Bank staff that facilitated the RWRA, although its success was

¹³ World Bank. 2007. "Tanzania Water Sector Support Program." Project Appraisal Document. Washington, DC: World Bank.

directly related to the fact that it was largely driven and owned by the Tanzanians.

While there were public concerns about the state of water resources and the widespread impact of drought, the concerns were focused on local issues—pollution, conflicts over access, etc.—and they were not clearly addressed in a coherent public policy issue, and therefore a public driver for the RWRA study. Nevertheless, the political drive to initiate reforms, starting with the RWRA, partly arose from these public concerns.

Procedural Competence

Accountable. The Ministry of Water, Energy, and Minerals was responsible for water management at the national level and was the client for the RWRA. It was responsible for organizing and implementing water reforms. The study was undertaken comprehensively and impartially. It was a collation and synthesis study rather than an analytical study based on new information. While it did not break new ground, it added some new information and organized existing information into a coherent picture and provided a direction for future water resources management. The study was not independently peer reviewed. The RWRA was initiated because of concerns about the sustainability of the (then) current water resources development patterns. It documented the seriousness of these issues and how they might be taken into account through an integrated approach.

Participative. All major water-dependent and water-related ministries were represented on the study team, so there was strong participation at the national level. A major stakeholders workshop was held in September 1994 to review the draft findings of the RWRA. However, the RWRA did not invite broader public participation. While this simplified the analysis, it meant that the task of developing widespread support for the water reforms was left to a later stage. Even though all water-dependent ministries participated in

the study, not all were convinced of the need for an integrated approach. Some sectors, such as the power sector, retained a core belief that their role was to generate power and the provision of water was not their concern.

Iterative. The RWRA results were not driven by an external timetable, although indirect pressure from external partners (such as the Norwegian Government) may have played a role and so were available to feed into the development of the strategy for water resources management. The information content of the RWRA study was sufficiently developed to provide directions for the strategy and the subsequent National Water Policy.

Substantive Competence

Integrated. The RWRA included environmental issues and responses in its scope, but the assessment of strategic directions did not take particular note of them. Similarly, the interrelationship between environmental, social, and economic objectives was clear within the study, although this was not emphasized. Thus, the RWRA pointed out the difficulties in water allocation and the importance of source protection, watershed management and pollution control, identified important wetlands, and placed considerable emphasis on social factors, including the conflicts that were then occurring between water users in the Pangani and Rufiji basins. The study was tiered downwards, with broad recommendations for the critical issues to be included in the plans for the four priority basins. It was also tiered upwards, with recommendations for national reforms, including policy and legislative changes. These included transboundary management as well as inter-sectoral reforms.

Sustainability-led. The rationale for the RWRA was to develop a more sustainable water sector in Tanzania. Consequently, the recommended approach to developing the strategy was designed to be more decentralized at the river basin level and sustainable

than the existing centralized, uncoordinated, sectoral development-oriented approach to water resources planning and management.

Focused. The RWRA collated the first national Tanzanian database on water resources. While this was insufficient for basin-level planning, it provided a credible basis for the recommendations contained in the report. One of the recommendations was, in fact, the need to improve flow and water quality monitoring for drawing up water allocation and water quality plans. The report was commissioned in order to give direction to the proposed water reforms and overseen by the ministry responsible for the reforms, and so it was inevitably customized to the decision-making environment. The study took about 15 months and cost about \$50,000, and so was cost- and time-effective.

Influential. The RWRA report was highly influential and provided the strategic direction for Tanzania's subsequent water reforms, including a new national water policy, a devolved institutional framework, greater awareness of environmental protection, and the need for a collaborative approach to management. It provided the basis for development assistance from multilateral and bilateral donors. It raised awareness of integrated water resources management, particularly among the members of the study team. The task of fully engaging all sectors in this approach has yet to be completed, but is ongoing.

Lessons Learned

A relatively modest investment in a strategic assessment proved to be highly influential in refocusing the direction of water management in Tanzania, partly because it was initiated when there was a rising

interest internationally in integrated approaches to water resources management, partly as a response to the 1991–93 water crisis, and partly because it was conducted by an inter-sectoral team. While the consultations were confined to ministries represented on the study team, they were sufficient for the purposes of this study. The report had credibility within the Tanzania government and with multilateral and bilateral development partners.

However, the lack of widespread public and institutional consultation at all levels meant that the messages about the central importance of an integrated approach to water management were not widely absorbed within some sectoral institutions. There has been a slow but growing understanding of this important concept, as shown by sectoral policies and legislation, although there are some sectors that still retain a singular focus on their core business. It takes considerable time to bring about these changes in attitude.

The study did not focus on environmental issues because they were not seen to be an issue in their own right. Rather, environmental considerations were included in the broader context of the water-related problems facing Tanzania, which had manifest themselves as water shortages, conflicts over access to water, and water quality problems.

The review was carried out by Tanzanian nationals within government institutions. This improved the sense of ownership of the results within government circles and helped build capacity and confidence within those institutions. This probably was the most important factor that contributed to the effectiveness of the RWRA.

Case Study 3. SEA for the Plan of Main River Basins, Czech Republic

Background

The Czech Republic has a long history of water management, which can be divided into two main phases—before and after the fall of communist regime in 1989. Until the early 1990s, water was managed as a branch of the national economy and largely seen as an input to the industry, energy, and agriculture sectors. Although the Water Act passed in the 1970s included several provisions for environmental protection, there was very limited enforcement of those provisions. The Water Act introduced a “Water Management Master Plan (1975)” that contained measures to safeguard the water demands of the national economy, but has almost no provision for environmental protection.

The economic transformation after 1989 also led to significant changes in water management, including decentralization of water management, conversion of water companies and river boards (later reinstated as state enterprises by the Ministry of Agriculture) to various types of business organizations (but always owned by the state), with responsibilities for the enforcement of economic instruments such as fees and charges for water abstraction and wastewater discharges. The accession of the Czech Republic to the EU in May 2004 led to implementation of several “water-related” directives, particularly the Water Framework Directive (WFD) that introduced IWRM principles into water management.

The current institutional framework for water management in the Czech Republic is specified in the 2001 Water Act. Jurisdiction is shared among the

Ministry of Agriculture, Ministry of Environment, Ministry of Health, Ministry of Transport, and Ministry of Defence. The Ministry of Agriculture is the central authority for regulating the use of water. Its jurisdiction covers the main watercourses as well as small watercourses (managed by the Czech Forests and Agricultural Water Management Administration) and groundwater. Since 2003, there has been a National Committee for Water Management Planning supported by regional committees at the river basin level comprising representatives of ministries, regional authorities, relevant institutions, NGOs, and others.

The Ministry of the Environment is responsible for water protection, including protection of the quantity and quality of surface and groundwater, flood protection, the protection of water sources and of natural water accumulation areas.¹⁴ The Ministry of Health is responsible (in cooperation with the Ministry of Environment) for bathing water. The Ministry of Transport is responsible for navigation, and the Ministry of Defence exercises authority in territory administered by the Czech Army. Operational administration and management of surface water and groundwater is based on eight natural hydrological basins and hydrogeological units and is provided by five river basin administrations—the Elbe River Board, the Vltava River Board, the Oder River Board, the Ohre River Board, and the Morava River Board—that report to the Ministry of Agriculture. There are also

¹⁴ These are areas set aside for possible water reservoirs, dry polders, etc. Although they may never be used for water accumulation, they are not able to be used for other purposes.

international commissions for the Protection of the Elbe, Oder, and Danube rivers, which are responsible for multilateral international cooperation, as well as national commissions established by the Ministry of Environment for cooperation and managing transboundary watercourses.

Under the 2004 Strategy for Water Management, the main principles of water management are:¹⁵

- Improvement of water resources management and water management infrastructure, including implementation of relevant EU directives, leading to effective and sustainable water use and reduction of detrimental impacts on the status of aquatic ecosystems
- Ensuring the provision of water and wastewater treatment services without detrimental effects on the environment and for socially tolerable prices
- Protection from impacts of extreme hydrological events (floods and droughts)
- Enhancing performance of water management institutions (including research and development, international cooperation and coordination, and optimization of water services)

These principles apply to all national authorities involved in water management (i.e. river boards, water authorities, etc.). The strategy includes IWRM principles.

The five river boards, in cooperation with the regional authorities, are preparing river basin management plans (RBMP) for the eight river basins. In 2006, a Plan of Main River Basins was prepared by the Ministry of Agriculture in cooperation with the Ministry of Environment, other central water administrative authorities, and regional authorities for the three main river basins (the Elbe, Morava, and Odra basins).

This plan will set the national strategy for the water sector and planning at the river basin level. It specifies framework objectives for surface water and groundwater management, for the protection of surface water and groundwater and aquatic ecosystems, for sustainable use of these waters, for protection against the adverse effects

of these waters, and for catchments. These framework objectives will then be adopted and made specific in each of the basin RBMPs. Once endorsed, the Plan of Main River Basins of the Czech Republic, together with the RBMPs, will replace the 1975 Water Management Master Plan.

The principles and objectives of protection of water as a natural resource are stated in the State Environmental Policy.¹⁶ SEA is under the Environmental Impact Assessment Act of 2004. The new procedural requirements for SEA (introduced through amendments in 2004) in this act are more extensive and detailed than those contained in the previous EIA Act of 1992, and transcend the requirements of the EU Directive 2001/42/EC. Under amendments to the EIA Act in 2004, SEA is required for policies and strategies, as well as for plans and programs (as required under Article 3 of the EU Directive), and is obligatory on the national and regional levels. Documents at the local level have to undergo a screening procedure to find out if SEA is required or not.

SEAs are carried out in two phases. The proponent for an activity under the act provides the responsible authority (the Ministry of Environment for national and regional activities) with a description of the policy, strategy, program, or plan. If the SEA is obligatory under the act, the responsible authority determines the scope and procedures for the SEA. If it is optional under the act, a scoping and screening exercise is carried out and, if an SEA is required, then the responsible authority issues the scope and procedures. This first phase is termed the “fact-finding procedure.” In the second phase, the SEA report is prepared in accordance with the act and the scope and procedures.

¹⁵ Ministry of Agriculture. 2004. “The Strategy for Water Management Policy of the Ministry of Agriculture from the period from 2004 till 2010.” Prague, Czech Republic: Ministry of Agriculture.

¹⁶ Ministry of Environment. 2004. “State Environmental Policy of the Czech Republic 2004–2010.” Prague, Czech Republic: Ministry of Environment.

The proposal, together with the SEA report, is subject to a public hearing and review by the relevant authorities, including those responsible for environment and health. Based on the SEA report and the consultation process, the supervising authority issues the final SEA statement. This specifies if the respective concepts can or cannot be approved from the environmental point of view and includes conditions for implementation. The statement is required for final approval of the activity by the responsible authority, although that authority does not have to accept all recommendations in the statement. However, the approving responsible authority has to publicly explain how the requirements in the SEA statement have been taken into account and, if some have not been accepted, reasons why they have not been accepted.

The SEA of the Plan of Main River Basins

SEAs were required for both the river basin management plans and the Plan for Main Rivers. The Ministry of Environment's fact-finding statement specified the following scope for the SEA:

- The links between the plan and the relevant national strategic documents
- The effects of the plan on species and habitat, landscape protection, and public health—especially for proposed dams, measures for flood protection, etc.
- The contribution of the plan to the revitalization of the landscape, protection against the soil erosion, and retention of landscape values
- The likely impacts of the plan on water quality
- The extent to which the plan supports the effective use of the water resources
- The likely impacts of the plan on nonrenewable natural resources

The SEA for the Plan for Main Rivers Basins commenced in April 2005, after the plan preparation had commenced. The SEA study was treated as an

independent exercise and did not influence the plan preparation, although there were discussions between the leader of the SEA team and the planning team.

The SEA was submitted to the Ministry of Environment in September 2005. Impacts of the measures proposed by the plan were scored using a simple 3-part system—positive impact, no impact, negative impact. These assessments, together with measures to mitigate them or compensate for impacts, indicators of impacts, and projects that could be subjected to EIAs were included in the SEA report. The plan, together with the SEA, was submitted to the Ministry of Environment in September 2006. The ministry adopted all conditions proposed by the SEA report:

- To locate wastewater treatment facilities away from flood risks and ensure their linkage to regional waste management plans
- To minimize effects on the ecological characteristics of the water streams and water-related ecosystems when implementing technical measures for flood protection and for the accumulation of surface waters
- To prepare the regulation on the use and application of sediments from wastewater treatment facilities
- To respect the conditions given by the SEA for the particular measures during the plan implementation
- To publish the settlement of all comments received during the plan preparation and the SEA on the web page of the Ministry of Agriculture.

With its concurrent development with the plan, this SEA is an example of a semi-integrated, impact-centered SEA carried out at the national strategy level.¹⁷

¹⁷ Although termed a plan, the instrument is like a policy or strategy document in establishing the high-level national direction for the three main river basin management plans.

Instrumental Controls

The SEA was initiated because of legislative (procedural) requirements in the Environmental Impact Assessment Act. That, in turn, was largely driven by requirements in the EU Directive 2001/42/EC. It's very unlikely that the SEA for the plan would have been initiated if there had not been this explicit requirement in the legislation. The Ministry of Agriculture (as the proponent of the plan) believed that the SEA was not necessary, since the Ministry of Environment was part of the planning team and the 2001 Water Act already required public participation in the plan.

The Ministry of Environment has oversight of the SEA process and provides final advice to the Ministry of Agriculture based on the SEA report and public comment. However, they are more focused on carrying out procedural obligations than objectively assessing the content and quality of the SEA. Thus, the Ministry of Environment provides the evaluative control over the SEA, although there is no independent assessment of the quality of the SEA. At the same time, the Ministry of Environment was involved in the preparation of the plan and believed that conflicts could be solved directly during the preparation of the plan. This dual role of the ministry reduced its ability to act as an independent evaluator of the SEA.

Public interest was focused on the plan itself rather than on the SEA, and so the SEA was not promoted through public drivers.

It is too early to comment on the extent to which the recommendations in the SEA will be carried out as the plan is implemented. Given the paucity of drivers for the initiation of the SEA, there is a strong possibility that the recommendations will be adopted in a minimal way.

Process Competence

Accountable. Although the lead ministry for the plan was clearly the Ministry of Agriculture, there was less clarity about the role of the Ministry of Environment.

It was both a partner in the production of the plan and was responsible for the SEA, which contained recommendations on the implementation of the plan. The SEA was developed by a five-person team led by experts from the Czech Agriculture University (Faculty of Forestry and Environment, Laboratory of Landscape Ecology) and included external experts. The study was carried out professionally, but it was not subjected to independent peer review. The SEA study clearly identified and documented its examination of potential impacts from the plan and made this information available to the Ministry of Environment and the general public. As required under the legislation, the ministry published the recommendations of the SEA and its acceptance of them.

Participative. The plan and the SEA met the formal participative requirements. The Water Act required public consultation for the draft plan, so the SEA legislative requirement for consultation partially duplicated this requirement. Drafts of the plan were published on the web page of the Ministry of Agriculture and comments were sought. The draft plan was presented to meetings of the National Committee for Water Management Planning during plan preparation, and occasionally at the regional level, but only as additional information rather than for debate.

The Ministry of Environment published a notification of the SEA in the SEA Information System, seeking comments from the public, and relevant authorities and public hearings were organized to receive comments on the final SEA. Numerous comments were received from regions, municipalities, and the general public, largely as a result of initiatives from interested parties in publicizing the availability of the draft plan for comment. The ministry's formal compliance with the legislation did not elicit much public response. All comments received were published on the web page of the Ministry of Agriculture, as required in the SEA recommendations. Access to the internet is growing rapidly in the Czech Republic, and this would ensure that regional and local authorities

had access to the SEA report if they thought to check the ministry site.

In spite of these legislatively required steps, there was no clear strategy for public participation in the SEA. The issue was not addressed in the fact-finding statement, the SEA report, or the final SEA statement. The SEA process could have used the existing network, consisting of a national committee for planning and river basin committees, in order to facilitate public involvement in river basin planning, but did not do so. The SEA could also have used (at least partly) the strategies for public involvement or operational plans for public participation endorsed in all river basins in 2006. Some parts of the SEA report are difficult to understand, and their purpose is not clearly explained. The non-technical summary in the SEA report released to the public includes only a brief description of the process, and provides neither a summary of the significant environmental effects of the plan nor instructions on how to comment on the plan.

The most contentious public issue was the list of 205 areas proposed in the plan as reserves for the accumulation of surface waters. The affected municipalities and NGOs expressed their opposition to this list and mounted a campaign to have it removed from the plan. After much public discussion and negotiations with the Ministry of Agriculture, the list was removed from the plan. However, neither the planners nor the SEA team approached the affected municipalities to explain the consequences from the expected declaration of these areas.

Iterative. The SEA was commenced after the plan preparation stage had started. It was potentially able to influence the plan preparation through ongoing discussions between the SEA leader and the plan preparation team. However, there were no significant changes to the plan as a result of this interaction, largely because the SEA did not identify any environmental risks or likely adverse effects from the plan.

Substantive Competence

Integrated. The SEA was confined to environmental and health aspects of the plan and did not explore social or economic aspects. However, these aspects were integrated by the planning team within their deliberations. The SEA is tiered to project EIAs. The RBMPs are already tiered under the Plan for Main River Basins, and the SEA makes recommendations for the content of EIAs that may emerge from the RBMPs.

Sustainability-led. The SEA process itself did not clearly identify sustainability issues—but some of the environmental aspects addressed by the SEA could be understood as “sustainable,” and these led to modifications to the plan that were more sustainable. The final SEA recommendations that were accepted by the minister related more to future implementation issues than to the content of the plan.

Focused. The SEA process and report assessed a wide range of potential impacts across air, water, soils, fauna and flora, forests, ecosystems, and health. The procedure for drawing up the SEA was focused on meeting the requirements of the legislation. The SEA report was delivered together with the plan to the Ministry of Environment, allowing the minister to assess the SEA proposals and make a decision on accepting them. The SEA was completed rapidly and efficiently within 18 months (April 2005–December 2006), taking 160 to 170 person-days to complete.

Influential. There were two pathways for the SEA to influence the plan—through interactions between the SEA team and the planning team during the plan preparation, and through recommendations by the SEA team in their report to the Ministry of Environment. The first pathway was not used—the two studies were largely carried out as separate processes. The minister accepted all recommendations in the SEA report. The major change required in these recommendations—strict conditions on the areas for surface water accumulation—was already complied with because of pressure from local authorities and other interest

groups. Other recommendations, such as better elaboration of the plan's handling of areas for nature protection, were not significant and did not require major changes to the plan. Nevertheless, they can be influential on the RBMPs and any subsequent project developments if the recommendations are enforced.

Lessons Learned

The SEA of the Plan of Main River Basins was prepared in line with requirements of relevant legislation. However, these requirements were interpreted in a formal and minimal sense and the SEA was not used to its full potential to improve environmental aspects of decision making.

- The SEA did not commence until after the plan had commenced and was not used to influence the plan's development.
- The Ministry of Agriculture posted the SEA and the settlement of comments on its website as required in the SEA statement, but did not inform affected authorities or those who provided comments to the SEA that the information was now publicly available. This limitation may have been related to the lack of diverse drivers for the SEA—the legislation and EU Directive were the only real drivers for the SEA, and so the ministry's response was to treat the SEA as simply a legal requirement.

The lack of interest in actively using the SEA seems to be because no one—not even the Ministry of Environment—understood how the SEA could assist in the preparation of the plan and what benefits it could bring.

The conditions included in the final SEA statement to improve the environmental performance of the RBMPs during implementation were fully accepted by the Ministry of Environment. However, given the minimalist approach adopted to the production of the SEA, it is unclear whether these recommendations will be influential on the RBMPs and subsequent project developments.

Better public participation requires:

- Clearly defined strategy for public participation, with definition of the target groups and the expected benefits defined in the beginning of the process
- Direct distribution of information to the municipalities possibly affected by the plan with an active attempt to engage them in the SEA
- Better structure of the SEA report, including a clear description of the methodology used and a brief summary of results

Finally, there is a need to clarify the role of the competent authority for SEA. A more active engagement by the competent authority, in this case the Ministry of Environment, would contribute to a better overall SEA. This would include better specification of the scope of the assessment (not necessarily directly in the fact-finding statement, but more precise specification could be done during the planning process, when the structure and the content of the plan was clear), and better guidelines for the assessment process. In addition, there is a potential conflict of interest when the ministry, which was a partner in the development of the plan, was also the authority responsible for overseeing and approving the SEA.

Case Study 4. Nepal Medium Hydropower SEA

Background

With its steep rivers and high flows fed by snowmelt from the Himalayas, and winter and monsoon rains, Nepal is ideally suited to hydropower generation. However, just over 600MW (less than 1.5 percent) of the economically feasible potential of about 43,000 MW has been developed. All but 92MW of this hydropower is from run-of-river schemes with daily pondage storage. There is also a small amount of thermal power generation and a further 65MW is imported from India.¹⁸

Although about 40 percent of the population has access to electricity, this is largely concentrated in the urban areas. Only 30 percent of the rural population has access to electricity. Domestic demand is increasing at about 5 percent and is estimated to require about 1000MW peak capacity by 2012, rising to 1800MW by 2020.¹⁹ Given the potential and the proximity to India, the Government of Nepal has identified hydropower exports as a priority export market. Northern India is estimated to require an additional 10,000 MW in 2006, rising to 34,000MW by 2012,²⁰ with the whole of India projected to require an additional 100,000MW by 2017. However, Nepal has been unable to develop its hydropower potential and tap that market. In fact, within recent years, Nepal has been a net importer of power from India, with 101 GWh exported in 2006 and 266GWh imported.

Power development during the 1990s was guided by the National Hydropower Policy (1992), which had the objectives of (a) exploiting water resources to supply

electricity to urban and rural areas; (b) enhancing hydropower to meet industrial needs; (c) promoting private sector investment in hydropower development; and (d) conserving the environment by supplying clean hydropower. The Environmental Protection Act (1997) required environmental assessment, including stakeholder consultation, for all relevant projects. While there was some foreign private sector investment in the sector under this regulatory framework, it was not sufficient to meet the needs of the growing domestic demand, let alone develop power for export. The Hydropower Policy was revised in 2001, specifically to increase private sector involvement in the sector. The revised policy calls for the creation of a more competitive environment, including introduction of more transparent and investment friendly procedures, and proposes procedures to reduce social and environmental impacts.

In the mid-1990s, the 200MW, \$1082 million Arun III was the major hydropower project under development. Part of the output from Arun III was to meet domestic demand and the balance was to be exported to India. At the time, it would have more than doubled the existing generation capacity in the country. However, in spite of requiring little resettlement and having only a small

¹⁸ 2006 data from Karki, A.K. 2006. "Opening Nepal Hydropower Investment and Accessing Indian Electricity Market." Kathmandu, Nepal: Nepal Electricity Authority.

¹⁹ Gautam, U., and A. Karki. 2005. "Nepal: Thermal energy for export." *South Asian Journal* 9: no pages.

²⁰ Karki, A.K. 2006. "Opening Nepal hydropower Investment and Accessing Indian Electricity Market." Presentation by the Managing Director, Nepal Electricity Authority, Kathmandu, Nepal.

reservoir for daily peak generation, the project was controversial because of potential environmental damage from associated works and the inadequate compensation offered to the displaced population. Following an adverse report from the Inspection Panel, the Bank decided to withdraw from the project and the development ceased.

The controversy over Arun III fueled a wider debate within Nepal (that included international NGOs) over priorities for investment among small, medium, and large-scale hydropower plants. Instead of the previous reliance on a few large hydropower projects, the government decided to follow a two-track approach. On the first track, immediate demand would be met through construction of some small, quickly constructed hydro projects and the rehabilitation and upgrading of existing facilities. The second track involved assembling a portfolio of medium-sized power plants (10–300MW range) that would meet domestic power demand in the medium term. These medium-sized projects would be funded through a mixture of public and private sector funds, including through a power development fund (PDF) established by the government. Although the PDF was primarily intended for the medium-sized hydropower projects, it could also be used for smaller or larger projects or for export-oriented projects if necessary. In general, export-oriented power development would be dealt with separately.

A Sectoral EA,²¹ funded by the World Bank under the Power Sector Efficiency Project, was used as a major input to selecting the portfolio of medium-sized power projects. Apart from adding environmental and social criteria to the traditional economic criteria for project selection, the SecEA process would also make investment in power projects more attractive for the private sector by reducing risk and increasing public acceptability of the projects.

The Sectoral Environmental Assessment

The SecEA,²² conducted during 1996 and 1997, described Nepal's past and expected future load growth

and then undertook a generic assessment of options for grid and off-grid supply in different regions of the country. These included micro, small, medium, and large hydropower plants; thermal options based on imported fuels; non-conventional options including wind power, biomass and bio-fuel generation, and solar photovoltaic systems; supply-side efficiency improvements in transmission and distribution systems; and demand-side management.

The SecEA confirmed the broad consensus that medium-scale hydropower offered the best way forward to meet the expanding grid supply needs, although renewable sources offered considerable potential for meeting rural demand. However, contrary to the claims of some NGOs, renewable sources would only supplement rather than substitute for medium-sized hydropower generation. The study also recommended the phasing out of subsidies to help reduce wasteful usage and curb demand.

The broad outline of the procedure for developing the portfolio of medium-sized projects for the PDF was developed jointly by the government, the Nepal Electricity Authority, and the World Bank. An Inter-Agency Steering Group, comprising ministries (responsible for water, power, environment, social and regional development and roads) and the National Planning Commission, was established to lead the process. The steering group oversaw a multidisciplinary professional study team—consisting of seconded professionals from NEA, government departments, and the private sector—that undertook the assessment. International consultants were responsible for the technical quality of the study team's work, to introduce new tools and methods, and to provide on-the-job training.

²¹ His Majesty's Government of Nepal. 1997. Power Development Project. Sectoral Environmental Assessment. Ministry of Water Resources. Kathmandu, Nepal: Government of Nepal.

²² The SEA description is taken from Case Study 2 in World Bank (2003). Stakeholder Involvement in Options Assessment: Promoting Dialogue in Meeting Water and Energy Needs. A Sourcebook. BNWPP/ESMAP. Washington DC: World Bank.

Stakeholders were involved from the outset in identifying options, specifying and weighing the evaluation criteria, and reviewing the results at each key stage. Initially, public notices were placed in the local media to explain the purpose of the exercise and schedule of activities. A website and public information office were established, and government departments, NGOs, civil society, professional and private sector organizations, and embassies and resident missions of donors active in the sector were briefed on the methodology and timetable for the SecEA.

The NEAs initial list of 60 potential sites was increased to 138 through public submissions. A three-part process—screening, coarse ranking, and fine ranking—was used to narrow down these potential project sites. The screening criteria were developed with stakeholder input and published for comment before being used. They included technical, social, and environmental issues. Forty-four sites were selected from the screening analysis. These were published in newspapers, and the screening report was sent to stakeholders for comment.

A formal multicriteria analysis was then used for coarse ranking, based on data collected from visits to the 44 sites by engineering, environmental, and social units from the study team. Baseline surveys were held with community members, including women and poor and marginalized groups. Using the formal analysis, 22 sites were selected for proceeding to fine ranking. Preliminary project layouts, rapid social appraisals, and initial EIAs were conducted for these 22 sites to provide a more detailed database. The ranking criteria were refined through workshops and meetings with civil society and professional groups.

After reviewing the results of the fine ranking analysis, the steering group recommended a portfolio of seven projects with three reserves. These were presented at a public meeting, which received full media coverage. After reviewing comments received, the steering group recommended the final selection of seven projects. Since the SecEA was completed, two of these have been

identified for development. The World Bank has been requested to fund Kabeli A, while the Government of Nepal would fund Rahughat Khola.

The SecEA also established the EIA and SIA procedures to be used for the projects funded under the PDF. These procedures are based on Nepal's Environmental Protection Act and Environmental Protection Rules (1997), and meet World Bank safeguard policies. Where applicable, project EIAs are required to contain an environmental management plan (EMP), an acquisition compensation rehabilitation plan (ACRP), a resettlement action plan (RAP), and a vulnerable community development plan (VCDP).

The SecEA was completed in April 1997. The World-Bank-funded Nepal Power Development Project²³, under which the PDF would be established to provide long-term financing to the private sector for the priority plants, was approved by the Bank Board in April 2003. The delay was a result of slippage in project effectiveness resulting from protracted discussions over the applicability of OP 7.50, changes in the scope of the project, and the appointment of the PDF administrator prior to negotiations.

The SecEA is an example of an impact-centered SEA (with some institution-centered aspects) carried out independently of the sectoral development program it was assessing.

Institutional Drivers

The World Bank was the immediate driver for the SecEA. While it was not a mandatory requirement, a thorough, community-based analysis of development options was seen by the Bank as the appropriate way to respond to the strong national and international opposition to the development of large-scale

²³ World Bank. 2003. "Kingdon of Nepal Power Development Project." Project Appraisal Document. Washington, DC: World Bank.

hydropower plants in Nepal. Government ministries, while agreeing to the SecEA, were initially skeptical of its value. However, after gaining some experience, they came to appreciate the importance of using the SecEA to lay a solid basis for future investment during the course of the study, but were disappointed when it did not lead to immediate investments by the World Bank and other lenders in the priority projects. The Planning Commission has remained a strong supporter of the process for their work in other sectors; the energy sector institutions are more reserved about its worth. Thus, the Planning Commission represents a potential professional driver for future SEAs, not necessarily in the water sector.

The public pressure that led to the termination of the Arun III project acted as a strong background driver for the SecEA.

Process Competence

Accountable. There was a clear line of responsibility from the study team to the Inter-Agency Steering Group, which put forward the recommendations for the priority hydropower development projects and EIA procedures. The actual commencement of these priority projects was less clear, since it entailed the establishment of the PDF and the willingness of the private sector to take up the projects.

The SecEA was carried out professionally with advice from experienced international consultants. A recognized multicriteria screening, weighting, and ranking process was used. There was considerable effort, in the wake of the Arun III controversy, to ensure that it was seen to be an open and fair process. The final SecEA report does not provide full details of how sustainability was included in the assessment process, although the information made available publicly during the SecEA did provide these details.

Participative. The assessment process—from selection of the initial set of potential sites and the selection

criteria to be used, to the opening of the final recommendations for public comment—was handled in a highly participative manner. Travel is difficult in parts of Nepal. Nevertheless, the study team held consultations with the communities at all 44 sites selected for the coarse ranking. The issues and concerns raised during these consultations were taken account of in the assessment process, although they are not included in the final SecEA documentation. Thus, the initial list of potential sites provided by the NEA was doubled in size because of public suggestions.

Iterative. The assessment was completed in time to contribute to the formation of the PDF as one of the components of the Nepal Power Development loan and, to a lesser extent, the new Hydropower Policy, which promoted private sector investments in the energy sector. There was an excellent set of information from the assessment on the impacts of the potential development projects, such that the recommendations from the steering group could be modified in light of new circumstances. Overall, the SecEA provided a strong basis for future decision making.

Substantive Competence

Integrated. The SecEA considered the full range of options, including thermal generation, hydropower, alternative energy sources, and demand management. The final recommendations included a mix of generation options for different purposes. The screening and ranking study to develop the portfolio of hydropower projects was designed to include environmental, social, and economic considerations (and their interactions) in the selection of projects. The level of detail of these assessments increased as the list of potential project sites was narrowed. Cumulative effects were considered where there were sequences of hydropower projects on specific river systems. The study was tiered downward to the project level, in that it recommended an environmental and social assessment framework for the prioritized projects. It was tiered upward, in that it fulfilled the (then)

Hydropower Policy by improving the basis for private sector investment in an environmentally and socially acceptable way.

Sustainability-led. Unlike a traditional impact-based SEA, this study did not consider more sustainable options to an existing policy, program, or plan. Instead, it used environmental sustainability as a principle criterion in the progressive selection of a portfolio of preferred hydropower plants.

Focused. The study was tightly focused on the task of laying a defensible basis for future power development in Nepal and was designed to be integrated into the characteristics of the decision process. Although the cost of \$1.2 million was high, the benefits were significant. The study took 14 months to complete.

Influential. The SecEA definitely improved the decision-making environment and contributed to the goal of attracting private sector investment. However, for other reasons (increased risks because of insurgency, delays in agreeing on the loan to establish the PDF) the SecEA did not lead to the immediate development of hydropower plants. It was also influential in illustrating the benefits of conducting an open consultative process and has led the Nepal Planning Commission to be a champion for future consultative processes.

Lessons Learned²⁴

The use of an open, consultative selection process, immediately following extensive controversy over power development proposals, proved to be an excellent mechanism for building trust and laying an agreed basis for future development. In addition, the portfolio was

improved because of the participation in terms of scale, regional spread, and project type.

However, the time needed to conduct such an extensive consultative process was seriously underestimated. The process was originally envisaged to take 3 months; it actually took 14 months. Once stakeholders became involved, the concerns they raised and their requests for more information or analysis had to be met. Sufficient time and notice was also needed for people to digest new information, for representatives to consult their constituencies, and for people to form opinions. The cost of conducting such an inventory and assessment exercise is high and may not be affordable for all countries.

Using a multidisciplinary study team had the advantage that the study team was able to respond to stakeholder needs as the process evolved and as stakeholders gained confidence that the process was not dominated by single interests.

National safeguard policies can be moved upstream in the planning processes. Projects that would have had adverse environmental impacts either within conservation areas, or where flow regimes would have been affected in downstream conservation areas were eliminated at an early stage.

The databases, spreadsheets, and other tools developed in the options assessment processes need to be maintained. In this case study, seconded staff members from the agencies responsible for power development and licensing were included as key members of the study team.

²⁴ These lessons are drawn from Case Study 2 in World Bank (2003).

Case Study 5. SEA for WATSAL Loan, Indonesia

Background²⁵

By the late 1990s, the Suharto government had been in power in Indonesia for over 30 years. It was criticized for widespread corruption, centralized and closed decision making, lack of accountability, and pursuit of economic policies at the expense of environmental protection. It was replaced in 1998, following the severe Asian economic crisis, by a more reform minded government under President Habibie. The new government set the stage for wide-ranging reforms in late 1998 by declaring a shift toward regional responsibility for managing natural resources and environmental protection. These moves toward greater government transparency, together with criticisms of the World Bank's past operations in the country, fostered a new determination for more open and effective communication with civil society.

At that time, the water sector was facing a number of problems, including growing water shortages and inter-sectoral competition, water pollution, environmental damage, flooding, downstream watershed degradation impacts, and declining physical and fiscal sustainability of existing irrigation infrastructure facilities. Management was weak, characterized by centralized decision making and limited participation, lack of cost recovery and an absence of funds for operations, underinvestment in infrastructure, and little coordination between water-dependent sectors.

The Bank agreed to support major reforms to the water and agricultural sectors through a sector adjustment loan (SECAL).²⁶ The reforms included

- Establishment of a national water council or apex coordinating body
- A national water resources policy together with associated legal, regulatory, and administrative instruments
- Reform of the Jatiluhur River Basin Authority, and establishment of four new self-financing river basin management agencies
- Establishment of basin water coordination committees, provincial water coordination committees, and hydrological units in key river basins
- Stakeholder representation on provincial and basin water coordination committees
- An improved regulatory framework, and use of fiscal incentives to reduce pollution
- Establishment of a system of water use rights for water allocations, and an improved wastewater discharge permits system
- Establishment of frameworks that enable self-governing water user associations (WUAs) to operate
- Reform of national and local irrigation administrations
- Development of a national water resources management information system and database

²⁵ This section is taken from unpublished draft material by P. Pillai and J.R. Mercier and also from Alaerts, G. 2000. Environmental Assessment for Sector Adjustment Loans: The Case of the Indonesia Water Resources Sector Adjustment Loan. Environment and Social Safeguard Note 3. East Asia Environment and Social Development Unit. Washington D. C.: World Bank.

²⁶ World Bank 1999. Indonesian Water Resources Sector Adjustment Loan, Presidents Report. Washington D. C.: World Bank

The problems in the sector had been increasingly severe during the 1990s. By the late 1990s, there was considerable willingness among the professional staff in the Ministry of Public Works and in the Bureau of Water Resources and Irrigation (BWRI) for these reforms. Local government had also become increasingly vocal about the need for change.

The longer term objectives were to make the reforms sustainable by building professional expertise within the country, facilitating a process of reaching intergovernmental consensus and internalized “ownership” of the reforms, and improving sector management by improving its capacity to attract subsequent donor support.

The loan was prepared during 1998 and early 1999. It was approved by the World Bank Board in April 1999. The loan was executed through the Inter-agency Task Force on Water Sector Policy Reform, under the joint chairmanship of the National Development Planning Agency and the Public Works Ministry. The task force had a broad-based membership, including sectoral ministries, the two existing river basin organizations, provincial public works departments, the national scientific organizations, and NGOs.

The Sectoral Environmental Assessment

The terms of reference for the SEA stated that the assessment would provide information on the possible outcomes of the reforms, assess the risks associated with these reforms, and outline mitigation options for any anticipated negative impacts. The SEA also looked at the environmental impact assessment procedures applied for water sector interventions, and the proposed revisions to the EIA process to provide more transparent, impartial, and objective evaluations.

The study was prepared by the Inter-agency Task Force on Water Sector Policy Reform, thus ensuring close coordination between the SEA study, the WATSAL project, and the overall water sector reforms.

The study was built around widespread public consultation rather than analytical work. These consultations broke with the previous history of centralized decision-making and ensured that the views of potentially affected people and other relevant interest groups at province, district, and village levels were taken into account.²⁷ Three provinces (West Sumatra, West Java, and South Sulawesi), were selected for the consultations. At the province level, the consultations were primarily with provincial government institutions. At the district level, consultations were with district representatives of provincial government organizations, as well as social service and civil society representatives. At the local level, the emphasis was almost entirely on village representatives. The meetings were facilitated by NGOs to promote openness and avoid bias. They, in turn, hired local facilitators within each province. Detailed descriptions of these consultations were contained in the SEA report (available in English and Indonesian), together with the responses from the task force to the issues and suggestions. A national consultation was held in Jakarta, and there was a separate meeting with NGOs in each province on sustainability issues. After the SEA report was drafted, second-round consultations were held with the same groups to explain the extent to which their comments had been used to get their feedback and engage in further discussion.

The issues that arose during these consultations included:

- Lack of sectoral coordination in water resources management
- Rarity of enforcement of pollution regulations
- Lack of transparency and consistency in managing water rights, including the issuance of licenses

²⁷ Inter-Agency Task Force on Water Sector Policy Reform. 1999. Sectoral Environmental Assessment, Water Sectoral Adjustment Loan. Jakarta, Indonesia: Government of Indonesia.

- Need for a more holistic river-basin approach to water resources management
- Disadvantage of weaker irrigators users compared to more powerful stakeholders
- Lack of support from government agencies

These issues were responded to in the SECAL and the reforms by strengthening environmental assessments of water projects, improving stakeholder representation on basin committees, increasing support for WUAs, and ensuring that the reforms did not entrench the role already played by dominant groups at the district and village levels.

Institutional Controls

At the time of the SECAL, the Bank did not require an environmental assessment of sector adjustment loans, although the breadth of application of the EA policy (OP4.01) was under review. However, OD8.60 stated that adjustment loans should consider their environmental implications and so, in keeping with promoting sound environmental management of its lending activities, the Bank's East Asia and Pacific Region decided to support a sectoral EA for the loan. The SEA came about primarily because of the Government of Indonesia's interest in promoting openness and consultation, and the Bank's interest in testing EA at the strategic level in anticipation of the revised EA policy.

The readiness of the ministry staff to engage in the reforms and undertake the SEA constituted a professional driver for the SEA.

Although public pressure did not trigger the SEA, there was strong support for it from the provincial governments and districts and villages. In addition, the public consultation was seen to be so successful that the task force and sector agencies decided that most key reforms would be subject to public consultation. The principle of public consultation is now a provision of the new water resources law.

Process Competence

Accountable. The Inter-Agency Task Force was the lead organization for the WATSAL loan preparation and the SEA. The study was designed to be balanced and fair by obtaining opinions from four levels of management, using nongovernmental facilitators to avoid an appearance of bias. The study was not independently assessed. The SEA was conducted as an open process and the information gathered was made public through documents in both English and Indonesian. The responses of the Inter-Agency Task Force to the suggestions and proposals were included in the documentation.

Participative. The SEA was designed around participation by sectoral interests in different jurisdictions as well as by individuals at the village level. Their issues were clearly addressed in the SEA report. A second round of consultation was held to report back to the stakeholders on the responses to these issues. These second-round consultations had little benefit for the team, but they were considered to be extremely important in demonstrating that the participants were partners in the planning process, and that their input had been taken seriously and had been influential.

Iterative. The SEA was designed to feed into the preparations for the WATSAL loan and so did not delay it. In fact, the participatory work helped build support for WATSAL. The opinions collected during the SEA provided a rich source of information on people's objectives and hopes, as well as their concerns, and allowed the reforms to be made more robust. The SEA was not iterative in the sense of leading to successive environmental assessments at project level, although the review of EIA procedures conducted as part of the SEA would assist with subsequent implementation.

Substantive Competence

Integrated. This SEA was participative and not analytical. The breadth of consultations and the impartiality

provided by the NGO facilitators allowed the stakeholders to identify a diversity of issues and possible solutions. The inter-relationship between environmental protection and social and economic benefit was central to the discussions and to the design of WATSAL. It was thus clear to the stakeholders that flooding, health problems, and stream turbidity stemmed, at least in part, from poor environmental management.

The focus of the WATSAL loan and the SEA was on water resources management and irrigation rehabilitation. The SEA was tiered upward to policy and legislative reforms in these sectors, as well as downward to project activities in catchments and irrigation districts.

Sustainability-led. The modifications to the WATSAL design that resulted from the SEA contributed to the environmental sustainability and social acceptability of the investment.

Focused. The SEA investigations were managed as part of the WATSAL loan preparation and so were well integrated into the decision process. The investigations were not tightly focused; instead they were intended to allow stakeholders to raise issues and concerns that needed to be considered in the preparations. The SEA was both cost and time effective. It cost \$70,000, took less than 4 months to complete, and influenced an investment of \$300 million.

Influential. The study was successful not only in refining the WATSAL preparation but in introducing consultative approaches in subsequent water sector World Bank projects in Indonesia. As a result of its success, the task force and sector agencies also decided that most key reforms would be subject to public consultation. However, in 2003 there was a shift back toward a more centralized, less consultative approach within the Indonesian government. With the elections of 2004, the then-government was replaced

and the new government largely continued the more decentralized approaches that had been initiated under the reform and WATSAL. Even though their policies were not nearly as participatory and open as before 2003, there is a clear continuity.

Lessons Learned

This SEA arose from a fortunate coincidence of interests in both the government and the World Bank. Managers need to be able to take up these opportunities when they arise.

There were a number of reasons why the SEA was successfully implemented. First, giving the WATSAL task force the responsibility for conducting the SEA maximized the opportunity for the SEA outputs to influence the policy reforms. Second, the political backing from the National Development Planning Agency and the Public Works Ministry and the representation of sectoral ministries and agencies on the task force was critical to the success of the SEA process. Third, it proved to be important to have the NGOs as facilitators for the consultations. There was significant distrust of national ministries among some stakeholders, and these independent organizations provided credibility for the discussions. Fourth, the meetings with stakeholders were focused, because proposed reform material was distributed well in advance. Finally, the return visits to the stakeholder groups to explain the responses of the task force to their issues and suggestions added to the credibility of the consultations.

Reforms and sectoral changes do impact on the political economy of the sector and there are constituents who oppose the reforms. This typically leads to oscillating degrees of commitment to the reform agenda. Thus, a long-term perspective is essential to allow the nation to work through these actions and reactions. An SEA can be very helpful to understand and guide these processes.

Case Study 6. Environmental Flow Assessment, Pioneer Catchment, Queensland

Background

In response to concern about the state of many of Australia's river systems, the state and federal governments of Australia (Council of Australian Governments, or COAG) agreed on wide-ranging reforms to Australia's rural and urban water industries in 1994. The reforms included the development of water allocation plans for all Australian catchments and major groundwater systems. These plans were to include provisions for environmental water.

Each state established a different approach to meeting its obligations under the 1994 agreement for water allocation planning. Under the Water Act 2000, the State of Queensland had drawn up a state-wide water allocation plan and adopted a two-level approach within each of its 35 catchments: (1) a water resources plan (WRP) specifying the objectives for meeting the social, environmental and economic needs of the catchment; and (2) a resource operations plan (ROP) providing the details regarding how water resources would be managed from day-to-day to meet these objectives. These catchment plans are subsidiary legislation under the Water Act, and so their provisions carry the force of law.

To date, Queensland has completed 17 WRPs, has released three for public comment, and has two more in preparation. The Pioneer WRP was approved in December 2002, and the ROP was approved in June 2005.

The Environmental Flow Assessment

The Pioneer planning area (encompassing the Pioneer River, Sandy Creek, and Bakers Creek) is a small area, about 2,200 km², on the northeast coast of Queensland. Sugarcane is the predominant form of agriculture, although there is also cattle grazing and urban settlement in the catchment. Mackay is the major town. Apart from an estuarine wetland, there are no significant wetlands in the area. Within the study area, there are four endangered and three "of-concern" ecosystems, 18 rare or threatened plant taxa, and two mammal species (the water mouse and the Irrawaddy dolphin) and some macroinvertebrate species that are rare or endangered. Eungella National Park occupies a small part of the northwest of the catchment, and Mt. Kinchant Conservation Park covers about half of the Sandy Creek catchment in the southeast of the study area. There are two dams, Teemurra and Kinchant, in the planning area. The Mirani and Marian Dumbleton Rocks weirs control flows and levels within the Pioneer River. The Teemurra Dam and downstream flow regulators were completed for irrigation usage about 3 years before the study was carried out, and the water licenses were still being taken up as the dam filled. The Pioneer River is not overallocated, and the study area is not regarded as being under stress.

The SEA-type study assessed the potential environmental impacts of increased water abstractions in the Pioneer catchment. Environmental water requirements were assessed by a panel of experts

through an environmental conditions study²⁸ and an environmental flows report.²⁹ The former assessed the current environmental conditions, the likely conditions if all present water entitlements were utilized, and the key knowledge gaps. Specialist reports were produced on geomorphology, hydrology, habitat, water quality, aquatic vegetation, riparian vegetation, macroinvertebrates, fish, other vertebrates, and estuarine and marine environments. The flow regime under current and full-water abstraction entitlements were modeled with the IQQM model.³⁰ The environmental flows report quantifies the associations between changes in the flow regime of the waterways and their geomorphological and ecological impacts. This environmental assessment informed the decisions about water allocation between environmental and various consumptive uses.

This study was carried out under the Water Act 2000 and not the Queensland Environmental Protection Act 1994, which has very limited provision for EIAs of plans and policies. This case study illustrates an impact-centered SEA at the regional level, where the environmental assessment was undertaken independently of the plan, although the results of the assessment were integral to the water allocation decisions within the final WRP and ROP.

Instrumental Controls

A number of drivers operated to further the process. The 1994 COAG agreement and the 2000 Water Act acted as the primary procedural drivers for the water allocation plan.

The production of water allocation plans throughout Australia was overseen initially by the National Competition Council and subsequently by the National Water Commission. Both independent statutory agencies had authority to recommend that the federal government withhold funds earmarked for the state governments under the COAG agreement if there was insufficient progress with the reforms. This power had

been exercised in a number of cases, so this oversight acted as a realistic evaluative driver for the production of the plans.

Professional drivers were also important. While professional associations were not specifically involved, water managers and aquatic scientists throughout Australia were concerned about the state of the country's water resources. There was widespread acceptance of the need to ensure that environmental services were maintained through adequate and timely water flows.

Although not as prominent as other drivers, public opinion was probably the most powerful force behind the inclusion of environmental concerns in these catchment plans. In the early 1990s, there had been widespread public dismay over the degradation of the waterways in the southeast, leading to the COAG agreement. Ten years earlier, a federal government had been defeated largely on environmental issues, and politicians were sensitive to public opinions on these issues. This public interest in environmental water issues was maintained throughout the 1990s, as shown by the public engagement in water allocation plans, including the Pioneer Valley WRP.

Process Competence

Accountable. The catchment planning exercise was led by the Queensland Department of Natural Resources and Mines (now the Department of Natural Resources and Mines), and involved other relevant departments, stakeholders, and interest groups. The environmental

²⁸ Technical Advisory Panel. 2001. "Environmental Conditions Report. Pioneer Valley Water Resource Plan." Brisbane, Queensland, Australia: Department of Natural Resources and Mines.

²⁹ Technical Advisory Panel. 2001. Environmental Flow Report. Pioneer Valley Water Resource Plan. Brisbane, Queensland, Australia: Department of Natural Resources and Mines.

³⁰ Technical Advisory Panel. 2001. "Hydrology Assumptions Report. Pioneer Valley Water Resource Plan." Brisbane, Queensland, Australia: Department of Natural Resources and Mines.

water assessment was carried out by a technical advisory panel comprising eight professionals with scientific backgrounds in hydrology, geomorphology, and various speciality fields within aquatic ecology. The formal environmental assessment method—the Benchmark method—had been published in the academic literature and was regarded within the academic community as comprising best practice. The panel’s reports were publicly available on the internet and were available for comment during the public consultation phase of the planning. They were not independently peer reviewed. The panel’s reports provide extensive detail on how environmental sustainability was assessed from both fieldwork, existing data, and information, and from comparison with comparable rivers in other catchments.

Participative. The Water Act required the Minister for Water to form a community reference panel, including representatives of cultural, economic, and environmental interests in the proposed plan area, once the intention was announced to draw up a water resources plan. He was required to take notice of the panel’s recommendations when he was considering the plan. Submissions were also sought from the general public when the intention to prepare the plan was first announced and again on release of the draft WRP and ROP. A number of information sessions and meetings were also held with various interest groups in the plan area to allow face-to-face feedback.

In the case of the ROP, a total of 226 submissions were received by an independent referral panel formed by the chief executive of the department. The panel considered the submissions and made recommendations to the chief executive on each submission. This process was transparent, with a public report being produced³¹ detailing each submission, the recommendation of the referral panel, and the chief executive’s decision with reasons.

Iterative. The environmental flows study was timed to feed into the decisions about water allocation within the Pioneer Valley. However, the way in which this

information was used within the decision arena is not publicly available, and it is not possible to assess whether the environmental studies provided sufficient information and to what extent the recommendations from the environmental condition and flows reports were utilized.

Substantive Competence

Integrated. Only two scenarios were assessed in the environmental study—the current water abstraction and the level of abstraction if all licenses were utilized following the completion of the Teemburra Dam. While this is quite a limited selection of scenarios, it does represent the outer limits of the range of likely levels of water abstraction and so was appropriate in this catchment. The assessment was restricted to assessing the environmental aspects of the flow allocation rules and did not include the social and economic aspects. However, the environmental, social, and economic aspects were all considered together when the water allocation decisions were made.

Sustainability-led. While this study did not attempt to identify alternative development options that were more sustainable, the benchmarking framework is quite robust and can readily be applied to other scenarios. While the ROP specifies quite clearly the environmental water requirements—such as minimum flows at different seasons of the year at strategic locations—the way in which these operating rules were derived from the environmental water study and the extent to which the environmental assets would be protected using these rules is not clear. The ROP requires ecological monitoring requirements and assessments that will be used to establish whether the ecological assets in the catchment are protected with the environmental flow regime in the WRP and ROP. This

³¹ Department of Natural Resources and Mines. 2005. “Pioneer Valley Resource Operations Plan: Community Consultation Report.” Brisbane, Queensland, Australia: Department of Natural Resources and Mines.

monitoring program was developed separately using a risk assessment approach.³²

Focused. The environmental conditions report and the environmental flows report, together with the hydrological modeling reports, provide an extensive base of scientifically credible information on which to make decisions. The key sustainability question within the catchment was the need to maintain the environmental quality of the river system in the face of the gradual utilization of licenses for the new Teemurra scheme. The study, in its choice of two scenarios for assessment, was focused on this question. The study, being required under the Water Act, was customized to the overall decision-making process required under the act. The environmental reports were a significant input to the decision-making process, and the WRP and ROP were designed to accommodate these environmental water requirements. This was achievable because the Pioneer River is not overallocated and there was little contention about the need to protect the aquatic environment.

Influential. The minister is required to take notice of the study when making his final water allocation decision. In that formal respect, it was influential. However, the extent to which the environmental objectives were maintained in the face of the development objectives is difficult to discern from the WRP and ROP. Nevertheless, there has been no protest by environmental groups about the plans, implying that the environmental objectives have been met.

Lessons Learned

Although the proposed set of drivers are a useful structuring device, the real world is more subtle and

interacting than is implied by such a simple set of possibilities. This case study illustrates how multiple drivers operate at different time scales and different levels of visibility. The formal procedural drivers of inter-government agreements and acts were actually driven, in turn, by public pressure and, to a lesser extent, by professional recognition that action needed to be taken on environmental water management.

The process by which the environmental considerations were incorporated into the catchment-wide plan generally conformed well to the process criteria proposed by IAIA. While the substantive components of the environmental assessment were effective in their own right in influencing the water allocation, they did not clearly meet all the IAIA substantive criteria. The minimal number of development scenarios and the lack of more sustainable development options emerging from the assessment are apparent deficiencies when assessed against the IAIA criteria. Nevertheless, they were appropriate in this context and indicate that the IAIA criteria may be too restrictive. In fact, the study was well-tailored to the requirements of the water allocation process and was influential in ensuring that the environmental water needs were met. This discrepancy is indicative of the difficulty of applying formal criteria, still partially derived from EIA-centered approaches, to an instrument that has widened in definition in recent years.

³² B. Chessman, and C. Marshall. 2004. "Environmental flows monitoring and assessment framework." Canberra, Australia: CRC Freshwater Ecology.

Case Study 7. SEA of Mhlathuze Catchment, South Africa

Background

With the enactment of the 1998 National Water Act (NWA 36 of 1998), South Africa abolished the concept of “private water.” All water was transferred to the state, with the Department of Water Affairs and Forestry (DWA) being the trustee. The provisions of the NWA divided the country into 19 water management areas (WMAs), each managed by a catchment management agency (CMA). Key responsibilities of the CMAs were to formulate catchment management strategies (CMS) and issue water licenses.

Under the NWA, basic human needs are the first priority for water, followed by water to maintain environmental services. Water for these purposes is held in a “water reserve;” water is available for other users only after these two needs have been met. The NWA also requires that the whole water cycle is managed, so land-based activities that use significant quantities of water, such as forestry and interception for farm dams, will require water licenses. These activities are called stream-flow reduction activities (SFRAs). These were new concepts in South Africa (and elsewhere) and, at the time of passing the act, it was not clear how they should be operationalized.

DWA adopted SEA as a tool for catchment management when it became clear that a wider frame of information was needed by decision makers operating under the NWA. CMAs would need to integrate environmental, social, and economic data when making decisions about all forms of water use, and SEA offered a participatory approach as required by the NWA.

Approximately 160km north of Durban, the Mhlathuze Catchment (4,209 km²) in the province of KwaZulu-Natal (KZN) was chosen as a pilot area to gain experience with SEA for catchment planning. The catchment lies within the Usutu-Mhlathuze WMA. The Mhlathuze River rises in the west at an altitude of 1,519m and flows east 170km to the sea. The area is, by South African standards, a high rainfall catchment, with rainfall generally ranging between 800 mm to 1400 mm along the coastal belt. The catchment can be divided into three zones. Firstly, an upland region above the Goedertrouw Dam is largely undeveloped communal land with extensive tracts of forestry. Second, the central belt below the Goedertrouw Dam also includes extensive communal areas combined with intensive irrigated agriculture producing sugar and citrus products. Finally, a coastal belt with high rainfall comprises forestry, dryland sugar cane farming, and heavy industry. All industrial development occurs in the Richards Bay/Empangeni complex linked to the seaport facilities at the mouth of the Mhlathuze River.

The catchment is water-stressed.³³ The total system yield for the catchment is estimated to be 270 million m³/annum, yet water allocation exceeds the system yield by 32.4 million m³/annum. Not all allocated water is utilized, but there is clearly insufficient water for further development, particularly with the

³³ Retief, F. (undated). “Quality and Effectiveness of Strategic Environmental Assessment (SEA) as a Tool for Water Management within the South African Context.” Potchefstroom, South Africa: School of Environmental Sciences and Development, North West University.

requirements of the water reserve. The system yield will need to be enlarged through importation of water, or the existing yield will need to be allocated more effectively.

The Mhlathuze Catchment SEA

The study³⁴ had been initially focused on acquiring information and developing a coherent picture of available water within the catchment for licensing water use for new forestation. Its coverage was subsequently expanded to include all water uses in the catchment, including the implementation of the concepts of the human and ecological water reserves. This meant that the SEA had to consider not only all activities (not just forestry) within the catchment, but also all levels of decision making, from project to policy level.

In brief, the objectives of the SEA³⁵ were:

- To piece together various legislation, policies, regulations, and planning initiatives and to make sense of the large amounts of information
- To play a coordinating role within the catchment, bringing various initiatives under one umbrella
- To sketch out the water resources picture, providing everyone with a common baseline and understanding of the technical issues and creating a framework for talking about sustainable development
- To offer an all-embracing approach, incorporating social, economic, and biophysical aspects within an integrated system
- To add value to the information gathered by expressing a better understanding of context and importance
- To remain strategic in nature; the SEA should provide the catchment with broad-level answers as to how and where development trends can be allowed to take place (within ecological, social and economically sustainable boundaries)
- To provide the residents of the Mhlathuze Catchment with a decision support system (DSS)

The study is an example of an impact-centered SEA, undertaken to obtain information for a subsequent plan. The output of the SEA was intended to influence the CMS for the Mhlathuze Catchment prepared by the CMA, as well as decisions with regard to water licensing. However, at the time of a review four years later, the CMA had not been established, and so no CMS had been formulated and the process for granting water licenses also had not started.

With funding from DFID, the pilot SEA was undertaken by a team from the DWAF subdirectorates responsible for stream-flow reduction allocations. The study included specialist studies on water quantity, conservation and biodiversity, social characteristics, and economics.

Subsequently, the exercise was repeated for the Usutu-Mhlathuze WMA to see if a larger area (about six times the size of the Mhlathuze Catchment) could also be assessed using the same procedure. This scaled-up study was not successful. Unlike the SEA of the Mhlathuze Catchment, it was not possible to conceptualize issues across the disparate catchments that made up the WMA. There were also difficulties with engaging such a large and diverse community. Whereas individual communities and farmers could be contacted in the Mhlathuze Catchment, this was much more difficult across the WMA. Without the focus provided by the single catchment, this larger SEA lost direction and was never completed.

Institutional Controls

The SEA was not required under either the NWA or the environmental legislation. Although the study

³⁴ Department of Water Affairs and Forestry. 2000. "Strategic Environmental Assessment for Water Use – Mhlathuze catchment – KZN." Pretoria, South Africa: Department of Water Affairs and Forestry.

³⁵ Steyl, I., D.B. Versfeld, and P.J. Nelson. 2000. "Strategic Environmental Assessment For Water Use. Mhlathuze Catchment – KZN." Pretoria, South Africa: Department of Water Affairs and Forestry.

was funded by a development partner, there was no instrumental driver. Instead, there was a growing recognition within the Department of Environmental Affairs and Tourism (DEAT) and DWAF that tools like SEA were required for taking the integrative approach to water management required under the NWA and the White Paper on Water Policy.³⁶

Procedural/Process Competence

Accountable. There was no single clear client for the study. DWAF was responsible for carrying out the Mhlathuze Catchment SEA because they wanted to explore the use of SEA for comprehensive catchment planning. Because of its exploratory nature, the objectives were vague. The change in focus of the study from just forestry to all water using activities and from just project to policy level “over-elaborated its potential and eroded its clarity of purpose.”³⁷ The study was also intended to provide information for the CMS, which was the responsibility of the Mhlathuze CMA. The CMAs were not operational at the time, and so there was little direction over this later objective.

The subsequent SEA for the WMA did not receive purposeful direction from the department and eventually ceased.

The team undertaking the catchment SEA was technically proficient and the study was carried out impartially and professionally. The study team was advised by an international consultant experienced in SEA,³⁸ and the study was extensively reviewed nationally³⁹ and internationally,⁴⁰ both during and on completion of the study.

The catchment-scale SEA was extensively documented, consisting of a main SEA report and specialist studies on the social, biophysical and economic aspects of the catchment. It gives a clear picture of the state of the environment and sustainability issues in the catchment. One of the achievements of the study was to bring the overallocation of water to the fore.

Participative. A social analysis, carried out as part of the SEA, focused on the social and political structures and dynamics within the catchment in order to understand the needs of the communities. A formal public participation process was conducted as part of the social analysis component and was considered a cornerstone of the SEA. It was decided to focus the participation process on the communal rural areas because they were the largest group and presented the biggest need. A combined stakeholder workshop was also held, attended by representatives of agriculture and industry. The good attendance suggested that the participation process was relatively well-received, although the nonalignment of catchment boundaries with institutional boundaries left pockets of the catchment unrepresented. Overall, the catchment-scale SEA was successful in getting disparate groups of people together and interacting.

Iterative. The timing of the SEA process was such that it was not able to directly influence the decision making by the CMA, because CMA were not established at that stage. Even four years later, at the time of the retrospective review, the CMAs were still not functioning, and so the SEA had lost currency and immediacy. The SEA was also initiated before the finalization of the new municipalities in 2000.

³⁶ Republic of South Africa. 1997. “White Paper on Water Policy.” Pretoria, South Africa: Republic of South Africa.

³⁷ Retief, F. (undated). “Quality and Effectiveness of Strategic Environmental Assessment (SEA) as a Tool for Water Management within the South African Context.” Potchefstroom, South Africa: School of Environmental Sciences and Development, North West University.

³⁸ Peter Nelson, Bristol, UK.

³⁹ DWAF. 2000. “SEA for water use in South Africa – Formal review of process.” Pretoria, South Africa: Department of Water Affairs and Forestry.

Weaver, A. 2001. “Review comments on the report: Strategic Environmental Assessment for water use in the Mhlathuze Catchment – KZN.” Stellenbosch, South Africa: Council for Scientific and Industrial Research.

⁴⁰ Lee N. 2000. “Final review report: SEA for water use – Mhlathuze catchment – KZN Province.” Manchester UK: University of Manchester.

Wilson, E. 2001. “Review report: Mhlathuze catchment SEA.” (Unpublished report.) Oxford: Oxford Brookes University.

On the other hand, the exploratory objective of the catchment SEA was not driven by a specific deadline or instrument, and the study was able to provide important insights into the value of SEAs for regional decision making while this was a current topic within DWAF.

Substantive Competence

Integrated. The SEA explicitly considered the biophysical, social, and economic impacts of the use and allocation of water in the Mhlathuze Catchment. These assessments were integrated for the rural communities, in that the social and economic consequences of water allocations to other land uses became very clear during the analysis. One of the economic studies assessed the volumes of water used and the value per m³ of water used for different activities, so that a consistent picture could be established for making water allocation decisions.

The study was intended to inform all levels of decision making, from project to policy level. The absence of institutional structures meant that it was unable to be tiered to project or plan levels, but it was able to be influential upward to the program/institutional level of the DWAF.

Sustainability-led. Based on detailed analysis of biophysical, social and economic issues, the catchment SEA suggested establishing sustainability criteria and indicators covering the effects of development on the biophysical environment, on social and cultural conditions, and on the economy. While the study did not suggest methods for weighting these criteria, it did provide a consistent structure for making decisions about development. This was a significant step forward from the more *ad hoc* methods adopted previously.

Focused. The reviews indicated that the SEA lacked focus in important respects. The data collection for the GIS was unfocused and not strategic. This was a consequence of the CMA not being formed, and the absence of catchment managers who could enunciate

exactly how they would use the GIS. It was also a result of the scoping component of the catchment SEA not being conducted properly, and the vague objectives failed to provide focus for this part of the study.

As discussed above, the Mhlathuze Catchment SEA could not be customized for the decision process at catchment or municipal levels because these structures were still being established. However, it did provide a rich source of information for considerations at DWAF level. This was a result of the process of the SEA and the many reviews, rather than the specific output of the SEA.

The SEA of the Usutu-Mhlathuze WMA also lacked direction and was never completed.

The Mhlathuze catchment SEA took about 2 years and cost about R2m. The subsequent Usutu-Mhlathuze WMA SEA took about 3 years and cost R5m.

Influential. The catchment-level SEA had very little direct influence on the catchment or its process. The CMA has not been established, so no catchment management strategy has been formulated and the process for granting water licenses has not started. However, the SEA did raise awareness among rural communities and advanced their participation in water-related decision making.⁴¹

The catchment-level SEA was more influential within DWAF. It provided a clear picture of the state of overallocation of water within the catchment and the relative economic and social values of changing the allocations as licenses were issued. In the absence of a CMA and its catchment management strategies, DWAF has developed an internal strategic perspective (ISP) for the Usutu-Mhlathuze to guide decisions. The SEA informed this ISP by providing data, and was influential for the development of ISPs for other WMAs.

⁴¹ DWAF. 2000. "SEA for Water Use in South Africa – Formal Review of Process." Pretoria, South Africa: Department of Water Affairs and Forestry.

At a wider level, there was an expectation that SEAs would be undertaken for all catchments, but this has not materialized. The proposed Directorate for SEAs was not formed, and further SEAs are unlikely to be undertaken for multisectoral water planning at the catchment or WMA level. The reasons for this are not clear, although it seems to be linked to the restructuring of the department and loss of staff. Instead, SEAs have been used for specific issues. An SEA has been conducted into forestry development in the Eastern Cape; DWAF is considering an SEA in the Sandveld (Western Cape West Coast) dealing with the problem of overabstraction of groundwater with concomitant destruction of wetlands; and DEAT and DWAF are about to undertake an SEA for the de Hoop Dam on the Steelpoort/Olifants system—a dam with important implications for the Kruger National Park.

Although the influence of the SEA appears to be quite limited from these specific outcomes, it has had a more subtle but powerful influence. Under the WMA, DWAF had to shift from being a water and forestry service delivery organization to one focused on coordinating and planning in a participatory manner. However, the department did not understand IWRM, and there was some resistance to the changes. The SEA did contribute to this shift toward a more holistic approach, including the social and environmental aspects of water resources management and the need to promote public involvement.⁴² All development activities are now assessed from a social, environmental, and economic perspective. The SEA influenced this shift in attitude.

Lessons Learned

There are both positive and negative lessons from the SEA.

Its biggest success was in helping bring about a change of attitude within DWAF toward multisectoral,

stakeholder-responsive, environmentally aware water management—IWRM. The extent to which the SEA contributed is difficult to judge and, without understanding the internal dynamics of the department at that time, it is difficult to discern what the underlying lessons are. Nevertheless, it illustrates the leverage that an SEA can achieve when it occurs at a time of transition in institutional structures and there is a need to move in new directions. Ironically, this shift occurred when the department shifted away from catchment-wide SEAs to single-issue SEAs.

Retief, in his review, concluded that “the lack of clarity on the identity of SEA, its very wide remit, uncertainty as to which decision making processes it aimed to inform, and general failure to convince decision makers of the added value of SEA, saw the SEA initiative within DWAF wither.”

Both the catchment and the WMA SEAs illustrate the importance of having clear objectives, a focused client, and a well-designed plan of work. The studies were weak in these aspects, and did not lead to direct outcomes.

The catchment and WMA SEAs also illustrate the importance of scale. The heterogeneity of the WMA mitigated against a single SEA study, especially because communities with diverse objectives needed to be involved. The Usutu-Mhlathuze SEA also shows the importance of commitment by senior managers to ensure that these potentially difficult studies are carried through.

⁴² Retief, F. (undated). *Quality and Effectiveness of Strategic Environmental Assessment (SEA) as a Tool for Water Management within the South African Context*. Potchefstroom, South Africa: School of Environmental Sciences and Development, North West University.

Case Study 8. SEA for Water Resources Planning, Palar Basin, India

Background

The Palar River Basin in Tamil Nadu State in the south of India has been the site for one of the first basin-wide strategic assessments of environmental and social issues in South Asia. The basin has a population of 5.4 million people and covers 18,000 km². Because the Palar River runs for only a few days during the North-East monsoon season, the population is highly dependent on adequate, good quality water from tanks and groundwater.

The basin faces some serious water-related environmental/social issues. Sand mining in the river bed has lowered river levels to the point where some tanks no longer collect water efficiently. The basin is the center of Tamil Nadu's leather industry, with about 600 tanneries located in the mid to upper basin. The industry uses numerous chemicals, including large amounts of salt, chromium sulphate, sulfuric acid, and ammonia. Although the tanneries now use either common effluent treatment plants or individual effluent treatment plants, there is a legacy of high levels of chromium and salt in the surface and groundwater. Salt levels of over 6,000 mg/l have been recorded in the groundwater in the vicinity of tanneries. This has severely impacted agricultural yields, resulting in a landmark decision mandating compensation from the tannery industry to about 30,000 affected farmers. The area near Ranipet is also heavily polluted by tannery chrome sludge impacting nearby drinking water supplies—so much so that it has earned the dubious distinction of being ranked among the top ten most polluted sites in the world.⁴³ Nearly 300 million liters

of untreated sewage is discharged daily in the basin, and there are high nitrate concentrations in localized areas because of excessive fertilizer use.⁴⁴ In addition, there is intense competition among industry, agriculture, and domestic use for access to the basin's scarce water resources.

Until recently, there was no river basin management authority in the Palar Basin to coordinate access to water and take a cross-sectoral approach to polluting activities. In 2000, the Government of Tamil Nadu formed the Palar Basin Development and Management Board,⁴⁵ with 23 members representing key departments, local districts, and administrators. The Institute of Water Studies (IWS) at the Water Resources Organization (WRO) provided the technical secretariat for the Board.⁴⁶ The initial task of the IWS/WRO was to develop a database, undertake research, and apply a water management model to the basin. However, the board had not taken an active role in managing the basin's water resources, primarily because there was no operational framework—vision, objectives, processes, guidelines, communications, etc.—for management.

⁴³ <http://news.bbc.co.uk/2/hi/science/nature/6063344.stm#map>

⁴⁴ Modak, P. 2003. "Development of a SEA based Framework for Sustainable Management of Palar River Basin." Discussion Note for workshop. Washington, DC: World Bank.

⁴⁵ The Palar and Thambiraparani Basin Development and Management boards in Tamil Nadu State were the first two broad stakeholder basin management authorities formed in South Asia with support from the World Bank-funded Tamil Nadu Water Resources Consolidation Project (TN WRCP).

⁴⁶ The WRO had been established and the IWS strengthened under a reorganization of water planning and management through the TN WRCP.

In addition, the IWS focused on data collection rather than interpretation and analysis.

In 2002, the World Bank funded a short technical assistance project within the Tamil Nadu Water Resources Consolidation Project to undertake an SEA of the Palar Basin to help the IWS/WRO develop an operational framework for the board.

The SEA

The first phase of the SEA consisted of:

- Scoping – review of reports, IWS database, initial discussions about issues, field visits for familiarization
- Capacity building – introduction of SEA concepts and data analysis for IWS staff
- Identification of issues – brainstorming workshop with IWS and environmental staff from WRO, use of external experts in workshop to analyse issues and previous responses
- Forming Vision and Guiding Principles – drafted vision, principles, and objectives through brainstorming workshop, consultations with institutions and stakeholders in the basin; finalization of vision, principles, and objectives

This first phase ended with agreement among the major sectors and interest groups on the priority issues facing the basin, a vision for the future, and objectives and guiding principles for achieving that vision. The Vision Statement was adopted at a multistakeholder SEA workshop at Kancheepuram in December 2003.

The process had initially focused on building the capacity within the IWS staff and reorientating them to a more active analytical and advisory role. Once their confidence and skills had been increased, there was engagement with a wider set of stakeholders to formulate the vision, objectives, and principles. Most importantly, there was a common understanding of the priority issues facing the basin among the key stakeholder groups. The

process was also notable for its use of the technical skills that the IWS had developed over the previous few years. Maps, data reports, remote sensing imagery, and models were used to develop a common sense of understanding on which issues could be debated and objectives and principles could be developed. Finally, the linkages among environmental, social, and economic issues was emphasized throughout the process.

The three key issues that emerged from this discussion included:

1. Water availability, including degraded traditional tank systems, good groundwater access, and competing demands
2. Water quality, especially tannery-related and also increasingly from municipal and other industrial sources
3. Sand mining, which accounted for around 5000 truckloads a day and reduced groundwater availability and threatened water infrastructure

An action plan was developed in a second phase to achieve the objectives and address these key issues. A draft action plan was developed through a case-study-based workshop in late 2003 in Kancheepuram attended by diverse stakeholders from water dependent sectors, academia, NGOs, and government agencies. The plan covered policies and regulations, institutions, data collection and information, equipment, and resources. This draft action plan was then further refined through multistakeholder workshops customized to the interests of each group, before being presented to the Palar Basin Management Board for discussion.

Due to follow-up and parallel efforts, there has been progress on all three key areas. Projects to improve surface and ground water availability have been formulated and proposed for financing under the recently approved World-Bank-funded \$485 million Tamil Nadu Irrigated Agriculture Modernization and Water-Bodies Restoration and Management (IAMWARM) Project. Water quality concerns are

being somewhat addressed, both through industry upgrades and improved regulation. New sand mining regulations have been implemented throughout the state to improve the sustainability and governance implications of this activity. Many points on the action plan are expected to be implemented by the Palar Basin Management Board, with assistance from the IAMWARM project. Based on the experience of the Palar Basin pilot, the project will fund 63 other sub-basins⁴⁷ in Tamil Nadu State to form basin or sub-basin boards and conduct SEA studies to identify issues, develop a common vision and objectives, and build capacity for cooperative management.

Institutional Drivers

There was no legislative or instrumental driver for this SEA since it was neither required under state law nor as a condition of the (then) Water Resources Consolidation Project. Instead, it arose from discussions between Bank staff and a small group of senior managers about the need for a common framework within which the critical water resource issues within the basin could be handled. Many state departments, central agencies, and local institutions welcomed this rare opportunity to interact in a spatial context and coordinate their programs. The basin board and the state WRO continued to support the study as it progressed and resulted in the vision statement, objectives, principles, and action plan.

There was no pressure for the study from either the public or professional organizations, although the SEA gained increasing support from all stakeholders as it progressed. The continuing and widespread support for the SEA pilot is shown by its replication to all but one of the basins within Tamil Nadu in the follow-on project.

Procedural Competence

Accountable. The IWS was the primary agency to undertake this SEA activity to support the fledgling

Palar Basin Development and Management Board. The study was guided by an external consultant experienced in SEA and integrated river basin management. It was carefully designed to build capacity in the IWS, build support with stakeholders, and provide a pilot for other river basins, while achieving valuable outputs for the Palar basin. The structured stakeholder workshops and other interactions were carried out professionally and fairly, with all attendees being able to participate and have a frank exchange of views. The outputs—vision statement, objectives, principles, action plan—were not suited to independent review, but were widely assessed by stakeholders before being acted upon.

Participative. Participation was one of the pillars of this SEA. However, the participation was carefully developed, with the core technical group at IWS first being informed about and trained in the process before a wider group of stakeholders was involved. The stakeholders represented the main water-related organizations from state and regional institutions, industry groups, NGOs, and academics. Their views were included in the SEA outputs. The draft action plan was developed directly by the stakeholder groups in a major workshop in late 2003.

Developing a common information base among the participants was a significant issue, since many were only familiar with either their industry or their locality. Technical aids—including GISs, maps, and remote sensing—were used to help develop a common understanding of the whole basin. Nevertheless, the basin proved too big an area for many stakeholders to relate to; sub-basins would have been more suitably sized regions for planning.

⁴⁷ Chennai, Palar, Varahanadhi, Ponnaiyar, Paravanar, Vellar, Agniyar, Parambikulam Aliyar, Pambar Kottakarayar, Vaigai, Gundar, Vaippar, Kallar, Tamiraparani, Nambiyar, and Kodayar Basins.

Iterative. There was no issue in this case of ensuring that SEA outputs met the timetable of an external policy, plan, or program. The SEA was conducted to develop its own basin action plan. The procedure was iterative in that it successively built up the management framework for the basin and will now be rolled out in other river basins throughout Tamil Nadu.

Substantive Competence

Integrated. The workshop approach to the SEA allowed all key issues to be raised and discussed before prioritizing. Similarly, the responses contained in the action plan were synthesized out of the outputs from three theme groups, which considered a wide variety of potential actions. While these options were informally assessed by the stakeholders, they were not subject to formal analysis or assessment.

The linkages among environmental, social, and economic issues was a central component of the analysis of issues and actions.

Sustainability-led. This SEA was not undertaken as an impact-centered assessment of a proposed policy, plan, or program where more sustainable alternatives could be advanced. Instead, environmental sustainability was intimately linked to economic and social well-being, and was a central concern in drafting the vision, objectives, and action plan.

Focused. The SEA exercise provided the knowledge base for planning and decision making by the board, which they had lacked prior to the SEA. It selected and focused on a few key environmental issues that needed to be tackled to make life more sustainable for basin residents. The exercise was tailored to the needs of the board and its multistakeholder composition. Given the focus and impetus it provided to the board, the study was highly cost-effective. The study was undertaken through a \$20,000 Norwegian Trust Fund grant, with support from Bank supervision mission budgets and

client efforts through the Tamil Nadu WRCP, and took about a year to complete.

Influential. The SEA was highly influential within and outside the basin. Within the basin, the study provided the board with a management framework and a credible action plan for subsequent funding and implementation. The SEA study also provided a blueprint, plus some lessons from experience, for strengthening integrated river basin management and stakeholder participation in other basins/sub-basins within the state (e.g. the sub-basin of the Cooum River that flows through the state capital of Chennai).

Lessons Learned

The need for various institutions to develop a shared appreciation of the inter-relationship of issues and options in a basin was found to be critical (e.g. for water quality monitoring, groundwater recharge, sand mining, etc.). For an SEA, it is critical to get the ownership/demand/buy-in of key stakeholders (esp. in the counterpart government institutions) for them to play a catalytic/arbitrator role. In this way, stakeholders can all grow together as part of the process, the recommendations have a good chance of being eventually implemented, and spill-over impacts to other areas are improved.

SEA is best done when not viewed as a “safeguards” exercise for projects, but as part of ongoing institutional development and to evolve a more holistic longer-term coordinated framework for investments.

Environmental, social, and economic issues are very intertwined in basins such as the Palar Basin; hence, an SEA quickly evolves into an integrated basin planning approach and one should not focus overly on the environment in an SEA. In a situation where the principles of IWRM are not understood and mainstreamed, an SEA provides a vehicle for introducing some of the concepts through another mechanism.

There needs to be a merging of analytical and stakeholder participation processes to enable a useful SEA approach. Analysis requires a good knowledge base and modeling. Stakeholder participation needs a structured plan for engagement with customized consultation approaches for different stakeholder groups and appropriate platforms for interaction.

Approaches need to be evolved at different spatial scales. For example, in this SEA, collating views of stakeholders scattered hundreds of kilometers apart over the entire basin was unwieldy. Learning from this, the next IAMWARM project will use such approaches at a sub-basin level (usually with one central town/city) to enable stakeholders to interact on a more limited set of issues and make decisions at a more appropriate level.

Change management is essential for moving an institution faced with multiple severe issues from a

reactive, crisis-management mode to one characterized by a shared vision and a structured approach to management. An SEA-type approach could be a useful part of such a change management process.

There need to be some tangible outcomes early in the process (low hanging fruit) to retain stakeholder interest and participation. That is, there should be a focus on products and outcomes that matter to people (e.g. basin/sub-basin atlases, joint learning process to understand the viewpoints of different stakeholders, implementation of “quick-wins” on knowledge, coordination, and investments).

Finally, SEA is not an event or a series of events; it is a process where as much learning occurs through the process as through the outcomes. If successful, such an approach evolves into a process in perpetuity for monitoring, coordinating, and addressing evolving issues in the basin/sub-basin.

Case Study 9. Nam Theun II Hydropower Development, Lao Peoples Democratic Republic

Background

The Lao People's Democratic Republic has a population of 5.7 million and a per capita income in 2003 of \$340, making it one of the poorest countries in Southeast Asia. The country needs a GDP growth rate of 7 percent to meet its poverty reduction targets. In recent years, it has nearly achieved that target, with an average growth rate of 6 percent. The Government of the Lao PDR has a target of 90 percent of households to be connected to electricity by 2020. Domestic demand was forecast to be 378MW in 2005, rising to 548 MW in 2010 and 956 MW by 2020.⁴⁸

The country has the largest hydropower potential in the region, with only a small percentage of this potential developed at present. In addition, the country has significant undeveloped coal resources. Hydropower and minerals have been two of the country's major growth drivers, with sales of power to neighboring countries accounting for 30 percent of foreign earnings in 2003. Export demand is difficult to forecast, but export-oriented hydropower plants are expected to provide 1,250MW by 2010 and 2,796MW by 2020. Lao PDR now has bilateral power trade MOUs with Thailand (3,200 MW) and Vietnam (1,500 MW).

The country has an extensive portfolio of hydropower projects under study or under preparation, of which Nam Theun II (NT2) is the largest. This project, due for completion in 2010, will result in an increase in generating capacity of 1,070 MW, of which 995MW will be exported to Thailand and 75MW will be used

for domestic consumption. The project will consist of a dam creating a 450km² reservoir on the Nam Theun River on the Nakai Plateau, a tunnel to carry water to the generating station below the plateau, a channel to discharge the water into the Xe Bang Fai River, and associated transmission works.⁴⁹

The government has gradually improved its environmental and social protection legislation and regulations with assistance from the World Bank and the Asian Development Bank.⁵⁰ However, the implementation of these regulations is limited by the capacities of staff in the Ministry of Industry and Handicrafts and the Department of Environment under the Science, Technology, and Environment Agency.

Earlier dams, including the Nam Hinborn Dam further downstream on the Nam Theun River, have had harmful social and environmental outcomes. The government recognized that the NT2 project needed to pay greater attention to minimizing environmental and social costs and compensating affected people. The project has been subjected to widespread international

⁴⁸Norplan. 2004. "Lao PDR Hydropower – Strategic Impact Assessment. Final Report." Prepared for Lao PDR Ministry of Industry and Handicrafts and the World Bank. Oslo, Norway: Norplan.

⁴⁹World Bank. 2005. "Nam Theun II Project Appraisal Document." Washington, DC: World Bank.

⁵⁰Norplan. 2004. "Lao PDR Hydropower – Strategic Impact Assessment. Final Report." Prepared for Lao PDR Ministry of Industry and Handicrafts and the World Bank. Oslo, Norway: Norplan.

scrutiny and criticism. The decision to proceed with the project has considerable symbolic importance for the Lao PDR government, demonstrating the government's openness to private sector investment, ability to handle complex environmental and social issues and make difficult tradeoffs, and willingness to engage in participatory decision making.

The environmental and social issues arising from NT2 include resettlement of residents, restoration of their livelihoods, wildlife management programs on the Nakai Plateau, protection of the Nam Theun watershed, and mitigation of downstream impacts on Xe Bang Fai and Nam Theun rivers from the interbasin water transfer.⁵¹ There have been numerous studies and extensive consultation with affected stakeholders, starting in the mid-1990s and intensifying in 2004 and 2005. These have led to modifications to the project design to minimize the impacts of the development, including establishing operating rules for downstream river flows that help maintain the environmental health and social use of the rivers.

The Cumulative and Strategic Impact Assessments

The EIA studies included a cumulative impact assessment (CIA) for proposed dams in the NT2 region—the Mekong, Nam Kading, Xe Bangfai, and Hinboun basins—so that potential environmental and social issues could be uncovered and assessed in advance.⁵² This was primarily a desk study by a team of international experts with diverse social and environmental specialist skills, although an initial workshop was held with government ministry staff and NGOs.

The team assessed regional impacts from the NT2 development, including changes in water quality and flow along the Nam Theun/Nam Kading, the Xe Bangfai basins and parts of the Greater Mekong River; regional health issues and health service; improved infrastructure, including roads, electrification and water supply; threats to the Nakai-Nam Theun National

Biodiversity Conservation Area caused by improved access and population increase in the surrounding area; and the institutional capacity to handle these issues. They also reviewed the potential impacts of planned developments in non-power sectors (transport, irrigation, water supply/sanitation, forestry, fisheries, mining, health, education, conservation, poverty alleviation, and protection of minority groups) in both Lao PDR and regional countries.

The study summarized these potential cumulative impacts at 5-year and 20-year horizons over five regions in the vicinity of the NT2 project. For example, the study assessed the cumulative downstream changes in the Mekong River Basin from NT2 as well as other potential developments in the basin. It recommended a number of institutional and management improvements and capacity building activities to improve Lao PDR's ability to deal with these cumulative issues.

In addition to the CIA, a Strategic Impact Assessment (SIA) was carried out as part of the environmental assessment for the NT2 project. This assessed the sector-wide implications, including environmental and social impacts, from 22 planned hydropower developments within Lao PDR over a 20 year period to 2022. The study resulted in recommendations for strategic improvement of environmental and social management in order to reduce impacts and manage the sector in an environmentally and socially sustainable manner.

The study relied on an earlier study⁵³ of the potential impacts of these planned developments

⁵¹ Not all environmental issues were treated to the same extent. Thus, flows for environmental benefits below the dam were based on a predetermined flow amount rather than an a priori environmental flow assessment.

⁵² Norplan. 2004. "Cumulative Impact Analysis and Nam Theun 2 Contributions. Final Report." Oslo, Norway: Norplan.

⁵³ Worley International and Lahmeyer International. 2000. "Hydropower Development Strategy for Lao PDR." See "Project Catalogue" annex to the study.

to provide some generalized qualitative assessments of environmental and social impacts from the suite of developments. It also provided a brief qualitative consideration of alternative sources of energy and alternative programs for developing the country's hydropower potential. Finally, the study provides a generic discussion of water-related and land-related environmental impacts and provides some general suggestions on improvements to the regulatory and administrative environment and for improved capacity through training. None of the recommendations are specifically tied to the cumulative effect of the program of hydropower projects.

These SEA studies are examples of impact-centered and institution-centered SEAs carried out independently of the project and are unusual in that they are part of the environmental assessment for a specific project development.

Instrumental Controls

Both SEA studies were undertaken as part of the extensive environmental and social assessment for the NT2 project development required by the World Bank and other development partners—an instrumental driver. The level of international scrutiny that the project was subject to acted, in turn, as a powerful driver for the Government of Lao PDR, the World Bank, and other lenders to undertake world leading environmental assessment, including these strategic assessments. These public drivers differ from those in other projects because they came from international NGOs rather than from the stakeholders directly affected by the project.

While the Lao PDR environmental requirements have been progressively strengthened over the last decade, they do not specifically require these strategic assessments to be carried out for individual project developments. Nevertheless, the government was keen to demonstrate its environmental and social credentials and agreed to these additional assessments—a form of professional driver.

The trust that had developed between the government and the multilateral financing agencies over the years of preparation was central to the government's persistence in undertaking these extensive environmental and social assessments.

Process Competence

Accountable. The clients for these SEA studies are clear. The Social and Environmental Management Division of the Department of Electricity in the Ministry of Industry and Handicrafts has immediate responsibility for assessing the environmental and social impacts of power development projects, although the Department of Environment has overall responsibility for environmental safeguards. Both studies were conducted fairly and professionally, although the CIA study is notably more rigorous, balanced, and detailed than the SIA study. The information on sustainability issues is obtained from a diversity of sources in the CIA study, although the SIA study relied on fewer sources; both are adequately documented. Neither study was subject to independent peer group assessment, although both had to satisfy the standards of external funders, the ADB, and the World Bank.

Participative. Both reports were essentially desk studies, with neither engaging in extensive stakeholder discussions. The CIA study sought information from Lao PDR ministries and NGOs through an inception workshop; there is no information provided on the extent to which the SIA study involved interest groups. There was already an extensive stakeholder engagement program under way as part of the EIA, and it was appropriate to confine these studies to desk assessments (or at least confine the interactions to government agencies) because of their detachment from current issues. However, the CIA, which considered the development paths of regional countries, did not appear to have held discussions with representatives of these governments.

Iterative. Being published in 2004, both studies were available in time to be included in the decisions on the design of the NT2 project and the decision by the development partners to proceed with funding. While the CIA study does provide sufficient detail to be able to guide future power development strategies, the SIA study is too generalized to provide assistance.

Substantive Competence

Integrated. While both studies are strategic in that they considered the social and environmental implications of hydropower development beyond just the NT2 project, only the CIA study included other sectoral developments within and outside Lao PDR. Both incorporated sectoral development policies and strategies, particularly the CIA study, into their recommendations. The SIA study was clearly tiered to project level decisions about hydropower options. Both recommended improvements in legislative and institutional structures, including capacity for environmental management.

Focused. The CIA study provides sufficient information to give a strategic context for integrating potential social and environmental issues into decisions on hydropower development over the next 20 years. On the other hand, the information base for the SIA study is relatively weak, and its recommendations are generic and do not emerge from the information collected. Both studies were commissioned as part of the larger environmental and social assessment that accompanied NT2, and so are necessarily customized to the decision-making process.

Influential. Neither study was likely to have been influential for the purpose it was commissioned—assisting in environmental and social assessment of the NT2 power development project—although the CIA study provided both government and development partners with the context for their subsequent decision

to approve the project. However, both studies do provide valuable information for future program decisions by setting the scene for cumulative and transboundary environmental and social impacts as Lao PDR's hydropower development program proceeds.

Lessons Learned

These examples of SEAs are unusual in that they were triggered by, and were part of, a project-level EIA study rather than the other way around. The NT2 project was so far advanced and so dependent on resolution of immediate project-related environmental and social issues, that these more strategic studies were unlikely to be influential. Nevertheless, the CIA study provided reassurance that cumulative impacts were manageable and gave direction to future capacity building and institutional initiatives for handling them. The lack of detailed analysis and limited reliance on data in the SIA study limited its recommendations to generalities and consequently diminished its influence.

The studies also illustrate that, although stakeholder engagement is important, the relevant stakeholders for longer-term strategic studies such as these can be confined to governments and some strategic partners such as international funding organizations and some NGOs. Local groups potentially affected by decisions yet to be taken some years hence are unlikely to engage in these strategic studies.

Finally, the studies illustrate the importance of trust and good working relationships between the government and the development partners. This factor is seldom discussed or analyzed, but without it, the complex and long-running environmental and social analyses, both tactical and strategic, would not have been initiated or completed to provide the strong basis on which the decision to proceed with the project was undertaken.

Case Study 10: Transboundary Diagnostic Analysis and Strategic Action Program, Lake Victoria, East Africa

Background

At 68,000 km², Lake Victoria is the second largest freshwater lake in the world by area. However, it has a relatively small basin (compared to the lake area) of 193,000 km². Uganda, Kenya, and Tanzania are riparian to the lake, while parts of Rwanda and Burundi lie within its basin. The lake originally contained one of the world's most biodiverse stocks of fish—in the last 50 years, over 200 species of fish have disappeared from the lake, although some species persist in surrounding wetlands and small lakes. About 30 million people live within the watershed. Nearly 3 million people and the regional economy are highly dependent on the basin's natural resources. The population within the basin is one of the poorest in Africa. They experience numerous social and environmental stresses, including widespread watershed degradation, increasing water pollution, rising prevalence of waterborne diseases, increasing conflicts over access and use of natural resources, declining fisheries, loss of aquatic and terrestrial biodiversity, and more frequent and more severe droughts and floods. Recently, the rapidly declining lake levels—largely due to overabstraction of water for hydropower generation at Jinja—have created serious social, ecological, and economic problems and political tensions.

Environmental issues in the lake include eutrophication and cyanobacterial blooms; periodic outbreaks of water hyacinth; poor water quality and health issues from effluent and industrial discharges; high turbidity from inflowing rivers; decline in fisheries; loss of aquatic

biodiversity; degradation of fringing wetlands; and a decline in water levels from excessive abstractions for hydropower. Issues in the lake basin include deforestation and erosion, reductions in river flows, increases in riverine turbidity, and loss of terrestrial biodiversity.

Because of the magnitude of the issues and the dependence of the basin population on natural resources, a number of donors (World Bank, EU, FAO, Sida, DANIDA, UNDP, GEF) have provided assistance to help the basin governments address these issues. The largest of these projects was the World-Bank-managed Lake Victoria Environmental Management Project (LVEMP), in which GEF contributed \$29.4 million under its International Waters Focal Area. The LVEMP project had the objectives of:

- Maximizing sustainable benefits to riparian communities by using resources within the basin
- Conserving biodiversity and genetic resources for the benefit of the riparian communities
- Harmonizing national management programs in order to reverse environmental degradation trends in the region

The GEF/IDA-funded project ran from 1996 to 2002 (Tanzania) and 2005 (Uganda and Kenya). LVEMP was a complex project with multiple components and a complex administrative structure. It succeeded in improving the scientific knowledge base for the

lake and its basin,⁵⁴ building capacity within national institutions, helping establish the Lake Victoria Fisheries Organization (LVFO), and combating an outbreak of water hyacinth during the project period. However, there was no attempt to reach an agreed position between the riparian countries on the prioritization of the issues facing the lake and basin across all sectors, or on a program of action to tackle these issues. There were institutional improvements in the fisheries sector. The LVFO was established, there were attempts to harmonize the fisheries legislation of the riparian countries, and data sharing was established between the countries. Apart from this, LVEMP did not improve the management structures for the lake or influence national policies toward the lake and its basin.

The Lake Victoria Basin Commission (LVBC) was established under the East African Community (EAC) in July 2004. It has the objective of providing leadership in managing the lake basin and coordinating management activities by the member countries of the EAC (currently the original countries of Kenya, Uganda, Tanzania, and Rwanda, and the new members Rwanda and Burundi). With assistance from Sida, the EAC developed an agreed vision and strategy for the lake basin. Five cross-cutting policy areas were agreed within the vision statement: (1) ecosystems, natural resources, and environment; (2) production and income generation; (3) living conditions and quality of life; (4) population and demography; and (5) governance, institutions, and policies.

The Transboundary Diagnostic Analysis/ Strategic Action Program

While the mutually agreed vision statement helped lay the basis for cooperative management of the lake basin, it fell short of providing a prioritized list of issues to be tackled through a coordinated program of action by the basin countries. Consequently, the GEF funded the Lake Victoria Development Program (a precursor of the LVBC) to produce a regional transboundary diagnostic analysis and strategic action program (TDA/

SAP) between 2004 and 2007. The TDA and SAP were intended to provide a foundation for the formulation of the second phase of the Lake Victoria Environmental Management Project (LVEMP II).

A two-stage process was used to develop the TDA/SAP. In the first stage, national TDAs were produced, identifying the priority transboundary issues within Uganda, Kenya, Tanzania, Rwanda, and Burundi. All relied on stakeholder interactions, field visits, literature review, and data collection, although the methods and depth and breadth of these information sources differed between countries. Transboundary major perceived problems and issues (MPPIs) that affected each of the countries were identified from these information sources and prioritized using different approaches in each country. A total of 21 transboundary MPPIs were identified in the national TDAs, with each assigned a ranking of high, medium, or low priority, based on each country's perception.

In the second stage, these national MPPI priorities were reviewed regionally. The spatial extent of impacts (both environmental and socioeconomic) of these MPPIs and their root and immediate causes were investigated through a causal-chain analysis. This included the identification of institutional, legal, and policy issues (such as weak capacity and conflicting legislative requirements) that impeded the management of the MPPIs. Finally, the regional TDA proposes interventions—investments, scientific investigations, institutional strengthening, legislative changes—that will address these priority MPPIs.

The regional SAP drew upon further stakeholder consultations, the national and regional TDAs, and other material to identify 18 key transboundary Issues (KTIs). These were then prioritized, with the top five priority KTIs being (in order): (1) land,

⁵⁴ Hecky, R. 2003. "Lake Victoria Environmental Management Project: Phase 1. Scientific Stocktaking Report - Progress during LVEMP1 and Challenges for the Future." Washington, DC: World Bank.

wetland and forest degradation; (2) governance, policy, and institutional weaknesses; (3) fisheries, habitats, and biodiversity from domestic, industrial, and agricultural activities; (4) pollution, eutrophication, and atmospheric deposition; and (5) water balance, water use management, and climate change.

The regional SAP states that there was good correspondence between the five KTIs and the MPPIs ranked by the regional TDA.

The national TDAs were carried out between February and June 2006 and both the regional TDA and regional SAP were completed in March 2007. The LVEMP II project had been under preparation for some years and is due to be presented to the World Bank Board in February 2008.

The regional TDA and SAP provide an example of an SEA that is both impact- and institution-centered. It provided environmental and social information for a transboundary investment program, but was carried out independently of the program.

Institutional Controls

The regional TDA and SAP were driven almost exclusively by the requirement of the GEF International Waters Focal Area. They were required as a condition for contributing funds to LVEMP-II (an instrumental driver). There was no legislative requirement for this analysis in the basin countries⁵⁵ apart from Tanzania, where the Environmental Management Act (2004) required an SEA to be undertaken of programs such as LVEMP II. However, the regulations to support the EMA have yet to be written and the SEA provisions were not yet implemented. While the GEF provided an external assessment of the quality of the TDAs and SAP, there was no formal evaluative control over the studies. There was little public or professional pressure for these analyses, although there was widespread concern among international and national NGOs, natural resources managers, and governments about the environmental

state of Lake Victoria. Once the TDA/SAP process commenced, there was considerable enthusiasm from the stakeholders for the analysis of the issues, and the reports were discussed in depth.

Procedural competence

Accountable. The LVBC, being the executing agency for the GEF grant, was the lead agency for the regional TDA and SAP. However, LVBC has a coordinating role, and the lead agencies for implementing the actions in the SAP are the ministries of the governments within the EAC. It is too early to gauge whether they have the resources or the political backing to implement this action program. Also, the objective of the regional TDA/SAP appeared to change as the work progressed. The GEF project document for the study and the TDA clearly states that the work will provide priority issues for the LVEMP-II program. The SAP does not mention LVEMP-II in its justification or objectives, leading to uncertainty about the role of the SAP.

The national and regional TDAs were developed professionally, using extensive stakeholder input and formal analytical procedures. However, the results are uneven, with some countries not identifying prominent issues. Kenya does not discuss atmospheric deposition of nutrients, which is thought to be contributing a substantial proportion of the nutrient load, and Tanzania makes little mention of the drop in level of Lake Victoria, even though this has created major social, economic, ecological, and political problems. Further, there is a lack of comparability between the national TDA issues. Nevertheless, these difficulties are reconciled in the regional TDA. However, the procedures—whereby equal importance was attached to each of the five national TDAs to produce the regional TDA—led to biased results. Thus, issues of

⁵⁵ Transboundary EIA guidelines under preparations by the EAC have yet to be finalized.

considerable importance to the three riparian nations and that affected the majority of the basin population, such as the decline in the level of the lake, did not receive high priority because other issues were identified by all five basin nations.

There is also confusion between the roles of the regional TDA and SAP, with both producing prioritized lists of issues and actions to address the issues, although the prioritized lists are structured differently. The studies provide extensive documentation of the environmental issues in the lake basin and their implications for the long-term economic, social, and environmental sustainability of the lake basin.

Participative. The national and regional TDAs were developed with extensive stakeholder input using site visits, questionnaires, focus groups, and workshops, although the depth and methods of consultation varied between the countries. The SAP also used an initial workshop of stakeholders to identify issues. These consultations covered a wide range of stakeholders and were very influential in establishing and prioritizing the issues.

Iterative. The regional TDA and SAP were delivered late and, as a consequence, this has delayed the LVEMP II preparation program. LVEMP II preparation commenced with initial discussions on components to be funded in 2003, and was progressively refined through extended stakeholder consultations and assessments of lessons from LVEMP-I during subsequent years. LVEMP-II has four proposed components: (1) building the information base for governance and growth; (2) strengthening governance of transboundary natural resources; (3) enhancing sustainable economic growth; and (4) raising public awareness through education and communication. This is broadly consistent with the recommendations of the SAP. However, this is the result of a convergence of numerous discussions, studies, and reports on the issues facing the Lake Victoria Basin, including those that occurred during the TDA/SAP.

Substantive Criteria

Integrated. The strategic recommendations that emerged from both the regional TDA and SAP were based primarily on stakeholder assessment, although knowledge from previous scientific investigations was drawn on by the assessment teams. Thus, the recommendations had the strength of cross-sectoral support but the weakness of being built on perceived issues rather than deep analysis. One of the strengths of this approach is that the issues and their root causes were seen as a mix of biophysical, socio-economic and institutional problems. However, the KPIs from the SAP are organized in a disjunctive manner with the second priority KPI including governance, policy and institutional weaknesses and the other KPIs dealing with biophysical issues. That is, the inter-relationship between policy, institutional, social, economic and biophysical issues is not properly recognised.

The regional TDA and SAP are tiered into relevant government policies insofar as they recognize the need for these policies and supporting legislation to be harmonized across the basin for some issues. However, the MPPIs under the regional TDA, and even more so the KPIs under the SAP, are generalized and do not go into sufficient detail to outline EIA requirements for infrastructure investments.

Sustainability-led. Both the regional TDA and SAP develop priority actions that are intended to place the basin on a more sustainable footing. However, they were produced in parallel with the design of the LVEMP-II program, which itself had access to extensive information on actions required for sustainable development in the region. Consequently, LVEMP-II is designed to promote sustainability (see above components) and its design is consistent with the TDA/SAP outcomes.

Focused. Both the regional TDA and SAP assessed a wide range of potential issues before focusing on priority topics. Nevertheless, the priority issues in both documents remain pitched at a high level and would take further refinement before they could be

turned into action. Their scope is broader than the components in LVEMP-II, which is more specific on the planned interventions. Perhaps because of the processes followed, there are a number of important transboundary issues that were not adequately covered in the TDAs, including atmospheric nutrients (Kenya TDA), aquatic biodiversity (Rwanda TDA), reduced lake levels (Tanzania TDA), and groundwater issues generally. These issues were subsequently added in the regional TDA and SAP.

The regional TDA/SAP were not well-integrated themselves, nor were they well-integrated into the decision-making process for the LVEMP-II program. Nevertheless, they do serve as prioritizing and coordinating instruments for the LVBO beyond LVEMP-II, including coordinating national sectoral programs.

The cost (\$1 million) was high, and the project was time consuming (project approved October 2004, completed March 2007). Nevertheless, this was a complex project, with five nations at different stages of development and skill being required to coordinate their national priorities.

Influential. The EAC recognize that there are shortcomings in the regional TDA and SAP; these will be followed up during the implementation of LVEMP-II. In spite of this, the regional TDA and SAP were seen as valuable by the EAC, and they are likely to have an influence over the final design of the LVEMP-II program (its initial target). They also may act as important structuring instruments for the LVBC.

Lessons learned

With a transboundary project such as this, where there is complex procedural structure, it is important to have comparable methods and targets and indicators used in each country to identify and rank issues.⁵⁶ In addition, given the great disparity in sizes of the countries and the importance of the lake and basin to each country's

economy and social life, there may be a need to place greater emphasis on some country's perceptions than others. In this case, the collation of the national TDAs into a regional TDA provided an opportunity to correct some inconsistencies and omissions between the national TDAs, but that opportunity may not always be available.

The study was reliant on an instrumental driver for its initiation. Being an externally required condition, this is not a strong foundation for the study recommendations to be implemented. On the other hand, there is widespread government, professional, and public support for sustainable development within the basin, as manifest through mechanisms such as LVEMP-II, the Nile Basin initiative projects, and other multilateral and bilateral development projects. The TDA and SAP provided an opportunity to structure commonly recognized issues and responses. The regional TDA and SAP were undertaken so late that they have delayed the preparation of LVEMP-II program. Nonetheless, if these recommendations are used properly, they are likely to have an impact on the design of LVEMP-II, especially since the project already has a strong sustainability focus.

The two outputs from this study—a regional TDA and SAP—are overlapping and confusing. They use different terminology, structure priorities in different ways, and appear to be in competition in their attempts to identify priority issues. The SAP recognizes social, institutional, and environmental issues, but does not integrate them successfully. The purpose of the work also appeared to alter when the SAP was produced. SEA studies need to have clearer outputs and audiences if they are to have impact.

The level of stakeholder participation across the national TDAs, and regional TDA and SAP was impressive. This level of participation is commendable,

⁵⁶ Recommended indicators for GEF International Waters projects are described in Duda, A. 2002. "Monitoring and Evaluation Indicators for GEF International Waters Projects." Monitoring and Evaluation Working Paper 10. Washington, DC: GEF.

but can skew the choice of issues and override the results of more analytical work. Both scientifically based analytical information and stakeholder understanding and objectives need to be balanced in order to achieve a well-founded instrument. Also, equal weight was given to each of the national TDAs and SAPs, even though some countries were not impacted by some of the issues. This was most

noticeable in the case of the lake issues—for example, decline in lake level—which have great economic and social importance to large populations, but were down-weighted in the regional TDA and SAP. The procedures used in such transboundary para-SEAs need to be carefully considered and agreed to ensure that the recommendations represent the importance of the issues.

Section B: Integration of Environment into Water Policies

Four National and State Water Policies

No SEAs of national water policies were identified in preparing the sector analysis. However, the extent to which environmental concerns have been incorporated into national water policy was assessed by examining the water policies and legislation of three countries (South Africa, Tanzania, and India) and one state (Victoria, Australia).

The four policies have been written from different histories. South Africa is concerned about equity of access to water following apartheid, better use of existing resources, and consistency in water management across sectors; Tanzania is concerned about development and protection of the resource; India is focused on protecting water sources for drinking and irrigation purposes; and Victoria is primarily concerned about balancing water flows for ecosystem health and consumption. Nevertheless, protecting and enhancing environmental functions that depend on water are included in different ways and with different priorities in the four policies and their legislation. Table B.1 provides details of the policies and legislations examined in this analysis.

Recognition of Environmental Flow and Allocation Priority

All four policies recognize the legitimacy of water for environmental benefit, although the justifications vary. In its National Water Policy, India recognizes that water is part of a larger ecological system that is essential for sustaining life. Victoria also recognizes this interdependence in the first principle of its White Paper: “The management of water will be based on an understanding that a healthy economy and society is dependent on a healthy environment.” The Tanzanian NAWAPO also recognizes the relationship between maintaining aquatic environments and certain economically important activities such as tourism, water supply, and hydropower. While South Africa recognizes the need to provide water for environmental benefit, it is less clear about the inter-relationships between environmental functioning and social and economic production. The policy states that environmental areas need to be protected so that they are not degraded to a point from which they cannot recover.

Table B.1 The Policies and Legislation used in the Analysis of Environmental Considerations in Water Management

	Policy	Legislation	Comment
South Africa	White Paper on a National Water Policy for South Africa, 1997	National Water Act 36 of 1998	
Tanzania	National Water Policy 2002	Water Resources bill	The water resources legislation is expected to be passed in late 2007.
India	National Water Policy, 2002		Water legislation is enacted at state level
Victoria (Australia)	White Paper: Securing Our Water Future Together, 2004.	Water Act 1989 Act No. 80/1989 Version with amendments July 2004.	The Victorian policy is developed to be consistent with Australian national water agreements of 1994 and 2004.

The four countries assign different priorities to water for environmental benefit. South Africa and Tanzania assign water for the environment as the second priority after provision of basic human needs. In India, water for the environment is the fourth priority after provision of water for drinking, irrigation and hydropower purposes, although these priorities can be amended regionally if necessary. Victoria does not assign an explicit priority to any water uses. Its white paper on water management focuses on the need to ensure that the health of aquatic environments is protected through provision of water and protection of catchments, but the allocations of water to different sectors, including the environment, are left to the formulation of catchment plans.

Comprehensiveness

In its policy, Tanzania, recognizes the need to provide water to maintain ecological functioning of rivers, wetlands, estuaries, and riparian zones. While the policy includes protection of groundwater quantity and quality, it does not recognize the role that groundwater plays in maintaining some ecosystems. While the Indian Water Policy does not specify the water resource components to be maintained, it does explicitly recognize the role that groundwater plays in maintaining some ecosystems. The South African white paper places considerable emphasis on managing the whole water cycle, including rivers, lakes, wetlands, estuaries, and groundwater. Both the quality and quantity aspects of environmental flows are recognized as important for all these components of the water cycle. The Victorian white paper includes both surface and groundwater environmental requirements.

The Tanzanian and Indian policies and the South African white paper deal with catchment protection, water quality, and water flow issues that may interfere with environmental functioning. However, the levels of discussion and direction differ significantly. The South African white paper provides extensive detail of these issues. The Tanzanian policy, while not providing

as much detail, is very clear and comprehensive on the directions to be taken. The Indian policy mentions these issues, but provides little direction on either catchment protection or water quality management, other than the need for monitoring of point-source discharges. The Victorian white paper is strongly focused on flow management and river health, including riparian and catchment management. Although included, water quality is not dealt with extensively in the policy; it is covered in separate State Environment Protection Policies for surface water and groundwater.⁵⁷ The Victorian white paper is the only one of the four policies to include consideration of climate change effects on water resources. The policy states that both the environmental and consumptive water allocations will be re-established if long-term reduction in water availability occurs, and commits to a research program to quantify the effects of climate change on the state's water resources.

The Tanzanian and South African policies place considerable emphasis on cooperatively managing transboundary water resources. The latter says that, until there is an international legal system to guide the management of shared river systems, water to meet international agreements will be given a special status as a water allocation priority. In spite of sharing water resources with both upstream and downstream neighbors, the Indian water policy does not mention transboundary water management. However, it does recognize the need to manage the sharing of water between the states, although it does not specify any roles or mechanisms. Victoria shares water resources with three other Australia states. The Victorian white paper affirms the state government's commitment to work within the national water reform framework to manage these shared resources cooperatively, especially within the Murray-Darling Basin.

⁵⁷ EPA Victoria. 2003. State Environment Protection Policy (Waters of Victoria). Our Water, Our Future! Publication 905. Melbourne, Australia: EPA.
EPA Victoria. 2002. State Environment Protection Policy (Groundwaters of Victoria). No. S160. Melbourne, Australia: EPA.

Environmental Assessment

All four policies endorse the need for environmental assessments of large-scale development projects. The Tanzanian NAWAPO states that large water schemes must undertake an EIA. The South African white paper reinforces the need for consideration of environmental impacts of any water scheme according to the principles of integrated environmental management, which require an assessment of the possible impacts of a proposed project and the design of measures to reduce negative and enhance positive impacts. The Victorian white paper does not favor further project development, but requires that environmental impacts should be considered if any developments are undertaken. The Indian Water Policy states that the preservation of the quality of environment and the ecological balance should be a primary consideration during the planning, development, and operation of any project. The adverse impact on the environment should be minimized and should be offset by adequate compensatory measures.

None of these water policies mention strategic environmental assessments. However, the Tanzanian Environmental Management Act (2004) does specify that major water projects should be subjected to an SEA before specific project details are decided. It is anticipated that the new Tanzanian water resources bill will also require SEAs for integrated river and lake basin planning.

Mechanisms for Environmental Water Provision

The Victorian white paper describes a comprehensive system for providing environmental water through an environmental water reserve (EWR) for both surface and groundwater that will be held by the Crown (although administered by catchment management authorities) and will have a legal status equal to consumptive water rights. The government will use various mechanisms to acquire water from current license holders for environmental purposes where rivers and aquifers are overallocated, including investments

to promote water savings with the return of part of the saved water to environmental benefit and purchasing licenses and allocations on the water market. Catchment management authorities will be able to trade their environmental water entitlements on the water market.

The South African and Tanzanian policies propose a water reserve that will be used to meet basic human needs and environmental needs. The environmental need will be calculated for each catchment. Where the catchments are already overallocated, then “provision will be made for active intervention to protect the water resources.” The Tanzanian policy is less specific about the mechanisms (methods, procedures, and benchmarks) to be employed to provide environmental water. It states that water for the environment, in terms of quantity and quality, will be determined on the best scientific information available, considering both the temporal and spatial water requirements to maintain the health and viability of riverine and estuary ecosystems, and associated flora and fauna.

The Indian Water Policy does not provide information on the mechanisms to be employed to ensure water is allocated to the environment, although it does require that environmental considerations should be included in basin and catchment planning.

South Africa has passed a new national water law to incorporate the provisions of its policy; Tanzania is finalizing its new water resources bill to support its policy; Victoria amended its 1998 Water Act in 2004. However, some central provisions, such as the EWR, are not included in this amended act. The Indian Water Policy is not provided with national legislative backing, since water management is primarily a state responsibility.

Economic Instruments and Water Conservation

Financial instruments can be used to protect the environment by reducing water abstractions and

wastewater discharges if there are linkages between volumes used/discharged and prices charged.

Among the financial reforms proposed in the Victorian white paper is an environmental levy imposed on water authorities (estimated to be between 2 to 5 percent of water prices) to account for environmental impacts of water use. These funds will be used to promote sustainable management of water. A block tariff structure (i.e. progressive pricing) will be used to reward those who undertake water conservation activities. The Tanzanian policy states that water pricing and water trading will be gradually developed to promote water conservation, but does not give a time frame or provide details. There is no mention of an environmental charge for water use. The South African white paper says that consideration will be given to a resource conservation charge, but that this is a complex issue where issues have yet to be understood. Similarly, water trading may be introduced, but there are benefits and costs that have to be better understood before a decision is made. The Indian policy does not mention environmental charges.

The policies contain less information on charging for wastewater discharges. Neither the Indian nor the Tanzanian policies mention wastewater or pollution charges at all. However, the Tanzanian draft water bill does require wastewater discharge permits for urban, industrial, and agricultural wastewater disposal. The bill leaves it up to the basin water board issuing the permit as to whether the cost is related to the volume or quality of the discharge; i.e. whether the permit will act as an incentive to reduce pollution. The South African white paper says that a system of economic incentives will be put in place to encourage a reduction in pollution and that these funds will be used for resource quality management and protection activities. The Victorian white paper does mention that sewage charges will be structured to promote water conservation, but does not discuss details beyond the inclusion of sewage income as part of the calculation of the environmental levy.

Environmental Representation

Victorian legislation provides for environmental representatives to play a role in water management decisions. The Water Act (amended 2004) provides for a Water Trust Advisory Council, which advises the minister on water resources. Its 3–5 members can be chosen from a range of backgrounds, including environment, sustainability, finance, water infrastructure, and community service. The State Catchment Management Council, which oversees the catchment management authorities (the operational authorities), consists of 10 members. Currently, two have an environmental background—an environmental consultant and an environmental academic—and others have environmental protection experience.

The draft Tanzanian water resources legislation states that the membership of the Water Resources Management Advisory Committee, a technical advisory committee, shall include up to nine sectoral representatives, of which environment is one. Similarly, the Water Resources Management Council can have up to nine sectoral representatives, of which one can be from the environment sector. The basin water boards can include up to three sectoral members; the environment is one of the specified sectors.

The Indian Water Policy does not specify the institutional structure, largely because water management is a state responsibility. Consequently, there is no indication whether there will be environmental representation on national, state, or basin water management institutions. Water law is very fragmented in India.⁵⁸ It is largely state-based; in general, there is no provision for environmental representation on decision-making institutions.

⁵⁸ Cullet, P. 2007. "Water Law in India: Overview of Existing Framework and Proposed Reforms." Working Paper 2007–01. Geneva: International Environmental Law Research Centre.



Environment Department
THE WORLD BANK

1818 H Street, NW
Washington, D.C. 20433
Telephone: 202-473-3641
Facsimile: 202-477-0565

