

The background features a stylized illustration of a landscape. At the top left is a brown mountain peak. To its right is a cluster of colorful houses in shades of purple, blue, and white. Below these, a blue river flows. In the foreground, a brown dam with three arched spillways spans across the river. The bottom right corner shows a green field with diagonal lines representing crops.

Dams and Development

**Relevant Practices for Improved
Decision Making**

www.unep.org/dam

United Nations Environment Programme
P.O. Box 20586, Nairobi 00100, Kenya
Tel: +254-20-762-7821
Fax: +254-20-762-7827
Email: dam@unep.org
Web: www.unep.org/dam



UNEP Dams and Development Project

Dams and Development

Relevant practices for improved decision-making

A COMPENDIUM OF RELEVANT PRACTICES FOR IMPROVED DECISION-MAKING ON DAMS AND THEIR ALTERNATIVES



UNEP - DDP SECRETARIAT

P.O. Box 30552, Nairobi, Kenya.

Tel.: +254 20 7623891

Fax: +254 20 7624763

ddpinfo@unep.org

www.unep.org/dams

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ISBN: 978-92-807-2816-3
Job Number: DEP/0941/NA

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Produced and compiled by

The Secretariat of the Dams and Development Project
Division of Environmental Policy Implementation (DEPI)
United Nations Environment Programme
P. O. Box. 30552 Nairobi, Kenya
Tel. + (254) 20 762 35 08
Fax. + (254) 20 762 38 17
Email: ddpinfo@unep.org
Website: www.unep.org/dams

DDP Secretariat: Alberto Calcagno, Coordinator; Thomas Chiramba, Senior Project Officer; Wanjiku Kaniaru, Associate Expert; Liazzat Rabbiosi, Associate Project Officer; Mary Muthamia, Project Assistant; and Rose Oloo, Communication Assistant.

Proofreading and editing: John Dawson

Cover design, graphics and layout: United Nations Office at Nairobi, Publishing Services Section (UNON)

Printing: Progress Press Ltd., Malta

Distribution: SMI (Distribution Services) Ltd. UK

This publication is available from Earthprint.com <http://www.earthprint.com>



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Sara J. Minor/UNEP/Still Pictures

Foreword: United Nations Environment Programme Dams and Development Project

This publication is a contribution by the Dams and Development Project (DDP) in support of the efforts of countries and the international community directed towards achieving internationally agreed development goals for reducing poverty through environmentally and socially sustainable development of water and energy resources. The Compendium is intended to inform policy makers, managers and practitioners about what people are actually doing in this area, presenting real-life examples of good (and not so good) practice to inspire them to do things better in crafting local solutions.

This approach departs from that followed by most literature about dams, which focuses on their shortcomings and failures. The Compendium, instead, presents practices that, though not exempt from weaknesses, show a positive way forward. The concept of “good examples of relevant practices” has been adopted in pursuing this approach.

Responding to the request of the majority of stakeholders, the role of dams is considered in this document in the context of sustainable

development. This involves dealing not only with environmental and social issues but also economic aspects associated with the benefits of dams. A narrower perspective, focusing only on negative social and environmental impacts, leads invariably to polarising the debate on whether dams should be built or not. When the full range of social, environmental and economic issues is considered, dams become a valid option and the question changes to how to build a good dam. The global dialogue encouraged by the DDP Secretariat has drawn attention to this shift in the dam debate, and this Compendium is a partial response to answering the question of how to build good dams.

Undoubtedly, limitations were found in the elaboration of the Compendium, which deals with only a few new or emerging issues that are not yet fully developed, well documented, broadly evaluated and exempt from implementation problems. While acknowledging these limitations, the usefulness and relevance of the document has been ensured by gathering and presenting the information in a non-prescriptive and non-

judgemental way, accommodating divergent views. Chapters 2 to 8 of the Compendium comprise the characterization of the issues, a synthesis of the current status regarding frameworks and implementation and descriptions in boxes of some of the most promising case studies that illustrate specific aspects of the issues presented. Annexes provide further information on the process and rationale behind the elaboration of the Compendium and the full list of examples. A detailed description of the case studies can be found in the reports of the consultants that constitute the background information for the Compendium. These reports, which are being made available under the names of their authors, are accessible on the website. Interested parties can comment on them and contribute additional information, enabling readers to discover the views of stakeholders on the contents of the reports and the case studies.

A multistakeholder consultation process was followed throughout all stages of the elaboration of the Compendium, including its various drafts. This was carried out through the DDP Steering Committee, Dams and Development Forum and Government Advisory Consultative Group, which constituted the consultation platforms incorporated into the project governance structure. It is hoped that this process has resulted in a product that is more useful and better meets the needs of the end users and the expectations of the majority of the stakeholders.

The Compendium fulfils the goal of DDP Phase 2, which required the project to

produce non-prescriptive practical tools based on the core values and of the World Commission on Dams (WCD), and other relevant reference materials. As such, it is important to note that the Compendium is not meant to replace or replicate the WCD or any other relevant reference material, but may be viewed as a source of information that will contribute to all currently available approaches and tools aimed at enhancing the consideration of environmental and social issues.

The focus of this Compendium is not on what should be done but on what is being done, and how and by whom. It is hoped that it will impact on the way things are being done through raising awareness of the nature and scope of the issues that need to be considered in the planning and management of dams, and by showing how managers in all corners of the world are dealing with similar challenges and adopting innovative approaches in search of positive and sustainable solutions.

It is clear that available published information is limited and that assessment of practices is still weak, so while great efforts have been undertaken in assembling this body of knowledge, the Compendium presents only the first few issues of the full knowledge base that will be required to address all key issues under a variety of circumstances. However, the relevance and significance of the issues documented here, and their potential to make a difference, justify the publication and wide dissemination of this Compendium.



Jose Roig Vallespir/ UNEP / Still Pictures

Acknowledgements

This report has been elaborated under UNEP with guidance and input from the DDP Steering Committee (SC), the Government Advisory Consultative Group (GACG), the members of the Dams and Development Forum (DDF) and the donor governments. Chapters 2 to 8, dealing with nine priority key issues selected for this first version of the publication, were compiled from the detailed reports of consultants commissioned by DDP to undertake a thorough desktop research of the current status of the issues, in terms of frameworks and practice, based on available published information. The consultants and the issues they covered were as follows: Practical Action (identification of options), International Association of Public Participation authored by Vivien Twyford and Claudia Baldwin (stakeholder participation mechanisms), Dieter Heinsohn (social impact assessment), Kai Schmidt-Soltau (addressing outstanding social issues), Vincent Roquet (compensation policy mechanisms), Dominique Egré (benefit-sharing mechanisms), James Ramsay (environmental management plans), Carl Bruch (compliance mechanisms) and Víctor Pochat (international policy in shared rivers). The consultants have therefore been instrumental in providing key input and suggestions to the contents of these chapters. The members of the SC, GACG and DDF,

acting as individual stakeholders or as part of their advisory groups, have, through their valuable and critical comments contributed substantially to improving the contents of the publication, particularly considering the challenge of taking into account diverging views and keeping the document focused and neutral. Willie Croucamp, Matthew McCartney, Patrick McCully and Richard Taylor, in their capacity as members of the Editorial Group established by the Steering Committee, made invaluable input to the document in its final stages. John Dawson edited the drafts of the Compendium and made an invaluable contribution towards improving the readability of the text while retaining the key basic attributes of the document of being non-prescriptive and neutral. The staff of the DDP Secretariat, Alberto Calcagno, Thomas Chiramba, Wanjiku Kaniaru, Liazzat Rabbiosi compiled the drafts of the Compendium, incorporated comments from various stakeholders and coordinated the diverse background studies and the stakeholder consultation process on developing the Compendium. The core funding contributed by the governments of Germany, the Netherlands, Sweden, Switzerland, and the United Kingdom made it possible to carry out all planned project activities of the Dams and Development Project during Phases 1 and 2. This publication is one of the major achievements of the project.



Mark Edwards/Still Pictures

Executive summary

This publication is a contribution by the Dams and Development Project (DDP) in support of the efforts of countries and the international community directed towards achieving internationally agreed development goals for reducing poverty and promoting economic growth through the environmentally and socially sustainable development of water and energy resources. The publication is intended to inform policy makers, managers, practitioners, affected communities and other stakeholders about what people are actually doing in this area by providing real-life examples of good (and not so good) practice to inspire them to do things better in crafting local solutions.

The key issues dealt with by the publication address fundamental aspects essential to ensure the environmental and social sustainability of dams where they emerge as the preferred option for meeting water and energy needs from an early options assessment stage. It is envisaged that dams will continue, especially in developing countries, to be an option to consider alongside other diverse alternatives for improving water and energy supplies to meet internationally agreed development goals. There will, consequently, be a need to enhance

the benefits of dams and avoid many of their drawbacks by applying better decision-making processes within the overall framework of sustainability.

Box E1 Key issues dealt with by the Compendium

- Identification of options (Chapter 2)
- Stakeholder participation (mechanisms) (Chapter 3)
- Social impact assessment and addressing outstanding social issues (Chapter 4)
- Compensation policy and benefit-sharing mechanisms (Chapter 5)
- Environmental management plans (Chapter 6)
- Compliance (Chapter 7)
- International policy on shared rivers (Chapter 8)

Sustainability of dams involves consideration of the engineering, environmental, social, economic and financial aspects within the context of an informed and participatory decision-making process. This integrated approach also includes dealing with the entire basin when planning, developing and managing water resources, recognizing upstream and downstream interlinkages and being aware of particular stakeholder interests and areas of potential conflict. In practice, the environmental, social and decision-making aspects of dams are usually

less well understood and addressed than their engineering and financial aspects. Hence, any discussion on the sustainability of large water resource infrastructure projects focuses on developing a comprehensive understanding of these issues and their incorporation into local normative frameworks and actual practices.

To this end, the Compendium deals with prioritized environmental and social aspects. It is a non-prescriptive practical information tool that describes the nature, scope and current status in frameworks and implementation of a limited number of issues with their roots in the World Commission on Dams strategic priorities. Consideration of these issues is critical to establishing a decision-making process that will arrive at sustainable outcomes. The issues were arrived at through a process that involved wide stakeholder consultation on the methodology, contents and output.

Undoubtedly, some constraints were encountered in the process of elaborating the Compendium. These emanated partly from the fact that the issues dealt with were new or emerging and therefore are not yet fully developed or well documented, and are still to overcome implementation problems. Despite the limitations, it was possible to compile this pioneering publication that put together for the first time a significant amount of information on good examples of relevant practice for decision makers, managers and other users.

Each chapter presents a brief characterization of the respective issue, its main constituent elements, and a description of the current status in terms of how the issue and its main elements are captured in frameworks and have been taken forward in practice. Some case studies illustrating actual implementation of the issue and its elements are summarized in boxes. The full list of examples studied in detail during the compilation of the respective detailed reports is provided in Annex II. These reports, including the full description of all examples selected, are accessible in www.unep.org/dams/, in which the names of their authors are also given.

Below are the summaries of Chapters 2 to 8, which deal with the main issues identified in the course of preparing this Compendium.

Identification of options

A decision to build or not to build a dam ideally emerges from a comprehensive and participatory assessment of the full range of policy, institutional and technical options, from the start of the planning process. This chapter deals with the identification of the available options in a given local context, which is an important step in the comprehensive assessment process and requires careful consideration. This process starts with the assessment of needs and ends with the screening of all options to assess the most appropriate portfolio of actions.

Identification of options comprises the collation and validation of the full menu of possible alternatives to meet the expressed needs. The range of options that can be included in strategic planning for water and energy development might vary widely and include structural and non-structural, supply- and demand-side management and efficiency measures. The inventorying of options should pay attention to the scale of the intervention and the different time frames and lead times. Further, each of the options has to be sufficiently described in terms of technical, economic, financial, institutional, environmental and social attributes. This usually entails a certain level of preliminary investigation not exempt from certain challenges. These challenges include disproportionate levels of information available across options and controversies around the basic features of their description that might impact the screening process.

The review done for the Compendium indicates that the process of identification of options in particular, and the comprehensive assessment of options in general, is not fully integrated into national legal and regulatory frameworks. There are few examples of specific provisions in national frameworks to promote and enforce the process. Placing the identification and assessment of options early in the planning process depends on circumstances in each country. Currently, one widely adopted approach is to introduce strategic environmental assessments with appropriate stakeholder involvement. Multilateral and international financial

institutions are also developing tools that address the identification options. A range of instruments, such as the environmental impact assessment process, integrated development planning and country strategy papers, have generally been used as frameworks through which the identification and assessment of dams and their alternatives have been conducted.

Therefore, the identification and assessment of options, including stakeholder involvement, needs to be explicitly embedded in national legal and regulatory frameworks and its practice further integrated into the planning and management of the development of water and energy resources. This would reduce costs, improve stakeholder buy-in and reduce project risks.

Stakeholder participation

This chapter deals with the issue of stakeholder participation, which is key to improving decision-making and governance in the planning and management of dams and their alternatives. The issue has a special and cross-cutting role in processes concerning dams and their alternatives, including in all nine priority key issues dealt with by the Compendium.

In the available literature, definitions of stakeholder participation generally relate to stakeholder input influencing decisions. The approach reflected in the “spectrum of public participation”, developed from the experiences of practitioners, is seen as alternative to the “the business as usual” mode in which a decision is made, announced and defended.

Four key elements and mechanisms of stakeholder participation are discussed: stakeholder analysis and participation plans; techniques and tools; financing; and timing. Building on the World Commission on Dams framework, practical ways of identifying stakeholders and realizing the benefits of participation are presented, with techniques and tools tailored according to their intended purposes and suitability to stakeholders. Determining a reasonable level of financing can be informed by the consultation plan to ensure implementation with appropriate skills, time and resources. Finally, there is a need

to engage stakeholders early and throughout the project, allowing adequate time for participation.

The chapter notes that stakeholder participation needs to be grounded in legislation for minimum requirements to be met. Examples of international guidelines and national legislation are provided. The role that corporate and NGO safeguards have played is also discussed. Regarding implementation, the chapter notes that as numerous cases had to be reviewed to identify a few useful examples, there is limited successful practical application, particularly in developing countries. It highlights commonly identified barriers to participation, as well as the advantages. A limiting factor of successful participation has been that, in some cases, there are no specific budgets for stakeholder participation. In spite of this innovative mechanisms were found, in particular the benefit of interactive tools. The cross-cutting nature of stakeholder participation is illustrated through examples dealing with diverse issues. Finally, the lack of independent evaluation inhibits learning and continuous improvement.

The chapter concludes that there are some excellent regulatory frameworks on which to ground stakeholder participation and a wide range of cost-effective techniques for engaging communities to improve decisions. The techniques are however not widely and consistently applied, globally and within all stages of dam projects. Recommendations proposed include increasing commitment to the adoption of basic legislation and guidelines, and resourcing of stakeholder participation. The objective evaluation of participation will promote better understanding and improvements. Capacity-building in skills and techniques is essential to achieve effective stakeholder participation.

Dealing with social aspects

The chapter deals with the assessment of social impacts, which has become a distinctive and very important aspect of the dam planning process. Similarly, the elaboration and implementation of social mitigation and development measures is now a conspicuous component of environmental and social

management frameworks for project implementation. The importance attributed to social assessment is relatively new and results from concerns and lessons learnt from unsuccessful past experiences, as highlighted by the World Commission on Dams knowledge base. Outstanding social issues are the legacy of such negative experiences, which remain unresolved for a number of existing dams in all regions of the world. Dealing with such legacy is imperative if new undertakings are expected to gain the acceptance of the public, and if the confidence of civil society is to be built in the capacity of managers and practitioners to deal properly with social issues.

Taking notice of the close linkages between the issues, it was considered logical to address them together when dealing with the social aspects of dam planning and management. In effect, outstanding social issues in existing dams are usually a result of failures in the planning and implementation of social mitigation measures. On the other hand experience emanating from addressing outstanding social issues will provide valuable input for improving the assessment and management of social impacts.

The approach and methodology for social impact assessment varies depending on the purpose and application for which the assessment is being undertaken. A generalized process involves a series of key elements ranging from the characterization of the social environment through estimating the severity of effects, and the formulation of management actions that will allow for the effective management of the social change, and monitoring and assessment of outcomes. In recent times social impact assessment has become a relatively well-defined field, enabling analysis and assessment of information for the purpose of defining actions either to remedy negative impacts or to enhance benefits. Furthermore, it is apparent from the review done that, for the most part, social impact assessment is being undertaken to acceptable standards and levels of detail to enable the formulation of appropriate management plans (to mitigate negative impacts and to optimize benefits). Therefore, within the literature, there exists a reasonable body of experience upon which readers can draw.

However, a key gap emerging from the review carried out is that there are a very limited number of normative frameworks that deal exclusively and specifically with social impact assessment and, in a majority of cases, the assessment is implicitly captured within many international frameworks and embedded in national normative frameworks governing other overarching issues, from constitutional law to specific laws dealing with environmental impact assessments. Thus, from the review of the literature done and the case studies selected, the need appears to be to put in place normative frameworks specifically dealing with social impact assessment, providing appropriate linkages to existing normative frameworks covering the implementation of the management of social change. The social impact assessment process should therefore be formally defined to allow for compliance. Evaluation criteria to assist in assessing whether or not a particular assessment meets the requirements of the proposed normative framework and the proposed assessment process should consequently be developed.

Generally speaking, “outstanding social issues” are unsolved social situations resulting from failures in the planning and implementation of the mitigation measures addressed in the respective environmental and social management frameworks (for example environmental impact assessments, resettlement action plans, plans for indigenous peoples and community development plans). Often, they only became visible after project implementation (second-generation impacts). Claims related to outstanding social issues are usually raised by the affected communities, with or without providing evidence. The review of the literature carried out indicates that though much has been written on the nature of outstanding social issues, little has been published on how these issues have been addressed and hardly anything on the outcomes of the remedial processes.

The main factors triggering the addressing of outstanding social issues are usually the desire to increase public acceptance of new projects, and the need to comply with the right to remedy as articulated by the Universal Declaration of Human Rights and the International Covenant on Civil and Political

Rights. Compensation (cash or enhanced livelihoods) through remedy funds, grievance mechanisms, restitution and legal process appear to be the main approaches found in the literature to address outstanding social issues. Policy and normative frameworks promote the use of a combination of mechanisms to address outstanding social issues, such as grievance mechanisms and remedy funds. To improve the effectiveness and efficiency of an efficient long-term monitoring and evaluation system, which identifies outstanding social issues, should be put in place, in the context of a comprehensive approach to address outstanding social issues. Additional research is needed to increase the knowledge base and to assess the potential of existing and new mechanisms to address outstanding social issues.

Compensation policy (focus on benefit-sharing mechanisms)

This chapter discusses mechanisms that work towards the restoration and improvement of the livelihoods of affected people, including benefit-sharing mechanisms. It takes into account the main compensation policy principles set forward by the World Commission on Dams, the World Bank and the International Finance Corporation. These principles have been incorporated to varying extent into the national policy frameworks of some developing countries. These involve ensuring the improved livelihood of affected people, the implementation of developmental approaches, compensating people without formal entitlement to land, enhancing the involvement of affected people in planning and implementation of resettlement plans and indigenous peoples development plans and ensuring compliance with agreements.

Compensation policy mechanisms, in addition to basic in-kind and cash compensation for lost assets and lost access to resources, involve measures that aim to restore and improve the livelihoods of project-affected populations (through livelihood restoration and enhancement schemes, community development schemes, catchment development schemes and monetary benefit-sharing schemes).

Monetary benefit-sharing mechanisms involve sharing part of the monetary flows generated by dam operation with affected communities. Such mechanisms represent a relatively new approach. The main types of monetary benefit-sharing mechanisms are revenue sharing, development funds, equity sharing or full ownership, taxes paid to regional or local authorities and preferential electricity rates. The review of literature and case studies indicate that fundamental elements for successful monetary benefit-sharing schemes are (a) existence of an economic rent and overcoming financial constraints; (b) reconciling the goals of stakeholders; (c) ensuring the efficiency of redistribution of benefits; (d) ensuring the involvement of local communities; and (e) ensuring the accountability of agencies entrusted with the redistribution of benefits.

Regarding monetary benefit-sharing mechanisms, it is concluded that legislation on revenue transfers or development funds need to include mechanisms that ensure effectively that those affected by dams actually benefit from transfer payments. Establishing partnership agreements between developers and local communities is probably the most innovative form of monetary benefit sharing. These partnerships are hailed as the most innovative and win-win form of benefit sharing, contributing greatly towards project acceptance by local communities by recognizing the entitlement of affected people to a share of the economic rent generated by a dam and their right to participate in the management of local water resources.

All compensation mechanisms discussed would benefit from further studies, such as post-project assessments of resettlement outcomes based on surveys of local stakeholder representatives and on the outcomes and results of the benefit-sharing mechanisms implemented in the context of each project.

Well-established compensation policies for dam projects taking into account these mechanisms can, in developing countries, improve the lives of the affected people and communities by (a) fostering the adoption of appropriate regulatory frameworks; (b)

building required institutional capacities; and (c) planning and implementing long-term integrated community development programmes.

Environmental management plans

Environmental management plans are tools to ensure that environmental factors are carefully managed throughout the project cycle. This chapter discusses in detail different elements of environmental management plans and their relation to the different stages of project implementation, referencing some examples of practice. The concept and scope of environmental management plans have changed and expanded in recent years. International normative frameworks have evolved rapidly recently, in particular integrating a social and environmental systems approach since 1995. Some national frameworks have responded to these changes while others remain weak. Public regulatory and commercial environmental frameworks are converging. The World Commission on Dams knowledge base continues to be the most comprehensive review of the effectiveness of mitigation during implementation of dam projects.

The chapter identifies key factors contributing to the effectiveness of environmental management plans, including proponent and key partner commitment; participation of all stakeholders in plan development; ensuring comprehensiveness and quality; providing adequate lead time and support to develop appropriate institutional capacity for plan implementation; reinforcing the plan's formal status in project documents, agreements, permits and contracts; including full plan costs in project costs, economic and financial analyses, and budgets; systematic supervision and monitoring; and ensuring that plans are flexible and adaptive to be able to react to new situations.

It is concluded that there is a need to remove the financial constraints affecting the preparation of environmental management plans during project planning; to increase access to plan documentation and to stakeholder evaluations of the effectiveness of project environmental and social management

(except for resettlement, which has an extensive literature); to improve tools for the evaluation of such effectiveness; and to urgently promote the application of relevant practices in global regions where, at present, environmental and social practitioners are unable to identify examples of best practice.

Compliance

The World Commission on Dams highlighted the fact that compliance remains a significant challenge for many dams. This chapter explores the compliance issue through consideration of a variety of mechanisms or approaches to ensure that a dam project follows all the requirements and procedures at every stage. The mechanisms are a mix of regulatory and non-regulatory measures to encourage, facilitate and compel compliance. The review grouped the various instruments under the categories of incentives, facilitative approaches and approaches to compel compliance. In addition to the regulatory framework, it is important to have in place an effective system of incentives and disincentives; monitoring and auditing, including by independent third parties; public participation, transparency and accountability; independent means for resolving disputes, protecting rights and enforcing responsibilities; and not least, institutional and human capacity, political will and addressing corruption.

The review of the literature indicates that incentives are encouraged as a means of providing industry with more flexibility in achieving social and environmental goals, but they have yet to be applied extensively or fully effectively to dams. Performance bonds and other financial assurances are widely used in the mining sector in some countries and could be used to promote compliance with environmental and social requirements in the context of dams. Facilitative measures can be important in promoting compliance; these include internal approaches (capacity-building of the various actors, compliance plan or environmental management plan, self-monitoring, appointment of an in-house compliance officer, following a code of conduct or entering into an integrity pact, or adoption of an environmental management system) and external approaches (independent

compliance monitoring by NGOs, sometimes by a panel of experts, good neighbour agreements and similar pacts, transparency and access to information, and meaningful public participation and consultation). Such mechanisms may require more trust and some remain, however, underutilized. Three facilitative approaches that are emerging in the context of dams are the use of trust funds, participatory processes and inclusion of detailed terms and adaptive management in a licence or contract.

If the various incentives and facilitative mechanisms are not effective, national and international bodies can review non-compliance, resolve disputes, and (to varying degrees) apply sanctions for non-compliance. These include, for example, inspection panels, ombudspersons, panels of experts, and compliance advisers in various multilateral development banks; independent mediation and arbitration; national courts; and in rare instances international courts. Disincentives and deterrents can help to compel compliance, especially when there is a credible threat that non-compliance will be caught and punished.

The last decade has seen dramatic strides in measures to encourage, facilitate and compel dams to comply with laws, policies and other relevant norms. While much remains to be done, there are a number of innovative and promising experiences. However, the review suggests that there is still a significant gap between the availability of compliance mechanisms and their application. One of the most striking lessons of the case studies is the importance of support and leadership by high-level management. Three other observations also bear mention: the importance of transparency and public participation; the emergence of adaptive management; and the abiding role for measures that compel or promote compliance and motivate the use of facilitative measures. The will to comply is a particularly important factor for compliance, and industry leadership can be an important driver of change within the sector. In the discourse on dams, there is a preference for proactive approaches that encourage compliance at the outset, rather than those that remedy non-compliance after the fact. Empirical research suggests, though, that a strategic combination of deterrence-based



P. Frischmuth/UNEP/Still Pictures

(compelling compliance) and cooperation-based (encouraging and facilitating compliance) measures is most effective.

There is a need for more knowledge and for more sharing of knowledge regarding approaches that can effectively promote compliance in different contexts. More examples are necessary from developing countries, civil law countries, and other regions. More examples and analyses are also necessary regarding how the different compliance approaches relate to one another. In addition, it is necessary to build compliance capacity of the various stakeholders involved with dams.

International policy concerning shared river basins

Some 60% of global freshwater flows are contained in the world's 263 international river basins. Hence much of the world's freshwater is contained in catchments shared by two or more countries. Basin management presents a significant challenge to the countries involved when a basin is intersected by one or more political boundaries, introducing an additional level of complexity. Specific interventions for diverting water and constructing dams require constructive cooperation, which may be difficult to achieve due to differences between riparian States in economic development, infrastructure capacity, political orientation and institutional and legal set-up.

This chapter focuses on the role that the international community might play in avoiding conflict and facilitating inter-State processes for shared rivers to move towards compromise solutions that are to the mutual advantage of the States involved. Three core elements of international community involvement relate to international frameworks; international community actors; and the nature of involvement of the international community. The involvement of the international community is discussed on the basis of the key international frameworks, including the Helsinki Rules on the Use of the Waters of International Rivers and the United Nations Convention on the Law of the Non-navigational Uses of International Watercourses (yet to be ratified).

Other regional frameworks and examples of agreements are considered. The participation of actors in the international community – the United Nations, bilateral and multilateral development partners – and the roles they play in mediation, technical assistance and funding are highlighted.

The chapter concludes that while reports on conflicts on shared waters make headlines, cooperation on water issues rarely does. There is more evidence for water playing a catalytic role in encouraging cooperation than in triggering conflicts. Countries have entered into a significant number of agreements for a basin or region, a stretch of shared river or a certain project for cooperation and mutual benefit. There is available a comprehensive set of legal instruments on internationally shared waters. The international community, in the form of the United Nations, regional political and financial institutions and donor countries, has played an important role in adjudication, mediation, facilitation, technical assistance and funding.

The international community has played and will continue to play a positive role in promoting cooperative management of shared water resources and creating favourable conditions for the planning and management of shared rivers in general, and for the development of certain projects in particular. The participation of diverse United Nations agencies, and of international and regional political and financial institutions and donor countries, in facilitating shared water agreements between countries by providing technical advice and financial assistance, and by implementing solid initiatives such as the establishment of development funds, has been a key factor in resolving complex situations and fostering cooperation based on sustainable perspectives.

The cases analysed show an almost exclusive participation by public organizations. However, donors and national governments have recognized in some cases that the desired development objectives could only be achieved if the views and concerns of civil society were addressed, and in these instances strategic and long-term stakeholder and civil society participation at basin level was considered to make a vital contribution to the shared initiatives.



Mark Edwards/Still Pictures

1

Introduction

1. This Compendium is an information tool to assist decision makers and, the interested and affected public in the planning and management of dams and their alternatives. It deals with a set of key environmental and social aspects (Box 1.1) and gives examples of relevant practices that have actually been implemented.
2. Producing non-prescriptive practical tools and promoting multistakeholder dialogue at global, regional and national levels were the objectives of the Dams and Development Project (DDP). The project was established in 2001 to follow on from the World Commission on Dams (WCD) with the goal of promoting improved decision-making on the basis of the WCD's and other relevant reference materials.
3. The starting point of the dialogue promoted by DDP was the consideration and incorporation of a diversity of views regarding the role of dams and their alternatives and the debate around large dams. While substantive progress has been

Box 1.1 Key issues dealt with by the Compendium

- Identification of options (Chapter 2)
- Stakeholder participation (mechanisms) (Chapter 3)
- Social impact assessment and addressing outstanding social issues (Chapter 4)
- Compensation policy and benefit-sharing mechanisms (Chapter 5)
- Environmental management plans (Chapter 6)
- Compliance (Chapter 7)
- International policy on shared rivers (Chapter 8)

made in moving this debate constructively forward (see section 1.2.2), the various stakeholder groups still have different perceptions regarding certain technologies and practices (DDP 2005b). DDP addressed this issue through focusing on the decision-making process rather than on its outcomes and placing the discussions in the context of sustainable development.

4. The key issues dealt with by this Compendium address fundamental aspects related to the environmental and social sustainability of dams when they emerge as the preferred option after a comprehensive options assessment process. While the economic aspect is

not an explicit focus of this publication, it considers it an integral element of the decision-making process that is carried out in the context of a sustainable development approach comprising the three fundamental pillars of development – environmental, social and economic. This section aims to introduce the Compendium by placing it within the context of sustainable development and the debate around dams and development.

1.1 Dams, decision-making and sustainable development

5. During the last century water infrastructure projects involving large dams played a major role in the socio-economic transformation of many countries. At the same time, in a significant number of cases the benefits were not shared equitably, the negative impacts on the environmental and sociocultural structures were excessive or avoidable. In some cases their economic performance was questionable (WCD 2000). Diverging views have arisen on

the merits and demerits of dams, the roles they play, and their alternatives in providing water and energy services. However, recognition that such roles are complementary rather than mutually exclusive has been growing as the dam debate has moved forward (see section 1.2.2).

6. It is envisaged that, as part of the global effort to improve water and energy supplies to meet the Millennium Development Goals, more dams will be constructed, especially in developing countries, alongside other diverse alternatives (Box 1.2). There will, consequently, be a need to enhance the benefits of dams and avoid many of their drawbacks by applying better decision-making processes within the overall framework of sustainability. Figure 1.1 summarizes some of the complex issues around the planning and management of dams in the context of sustainable development. These issues will need to be adequately considered and addressed to achieve sustainable outcomes.

Box 1.2 Water and energy drivers and dams

Hydropower. Globally, hydropower provides about 19% of all electricity generated (that is, 2,650 TWh/y).¹ The remaining economically exploitable potential is 5,400 TWh/y, of which about 90% is in low-income regions (IEA 2006). At least 1.6 billion people lack access to electricity in their homes (UNEP 2006). Renewable energy is expected to meet 18% of the growth in electricity demand by 2030. Over half of this may come from new hydropower projects – including the rehabilitation of existing assets, mini-hydro schemes and large dams (IEA 2006). The renewable share of the world installed capacity of electricity generation is projected to be 22% in 2030 (IEA 2006). It is forecast that much of the growth associated with renewable generation will result from hydropower, including the rehabilitation of existing plants and the construction of large and mini hydro schemes.

Irrigation. About 30–40% of irrigated land worldwide relies on dams (WCD 2000). About 40% of food produced is from irrigated land (about 150 million hectares, or 17% of agricultural land). In the next 25 years about 90% of food production is anticipated to come from existing land. This implies a need to double the productivity of irrigated land, particularly in Asia and Africa.

Drinking water. About 1.1 billion people lack access to clean water (UNEP 2006). The Millennium Development Goals seek to reduce by half the number of people who do not have access to potable water by 2015. This will require the provision of additional freshwater, which might be provided through other means and sources in rural settings but may require the development of storage to provide large amounts of water for domestic use needed by big urban settlements.

Flood and drought management. Nearly 2 billion people live in areas of high flood risk (MEA 2005). Due to climate change, scientists expect that the frequency and intensity of extreme weather events – including floods and droughts – will increase. Dams can play an important role in strategies to adapt to climate change by storing water and regulating flows.

1 TWh/y = terawatt-hours per year. A terawatt is 10¹² watts.

1.1.1 Dams and sustainable development

7. Dealing with the environmental and social challenges within the context of meeting water and energy needs is at the heart of the sustainability of projects involving dams. Dams are one of the options, structural or non-structural, available to meet specific water or energy needs. In many cases water and energy services are best provided through a mix of options, large scale, small scale, supply side and demand side. Each situation is different. A decision to build a dam should emerge after a comprehensive assessment of the full range of available options, giving appropriate consideration to all aspects of sustainability.

8. Figure 1.2 illustrates the main features of the sustainability framework for the planning and management of dams. The project cycle includes policy, strategic and river basin planning stages, when options to meet the needs of the various water users are considered within an integrated water resource management approach in which the best portfolio of solutions is identified. When dams are identified as an appropriate option, this integrated approach involves dealing with the entire basin when planning, developing and managing water resources. Upstream and downstream aspects, such as catchment management, ecosystem functioning, livelihoods, and who are the beneficiaries and non-beneficiaries (particularly those

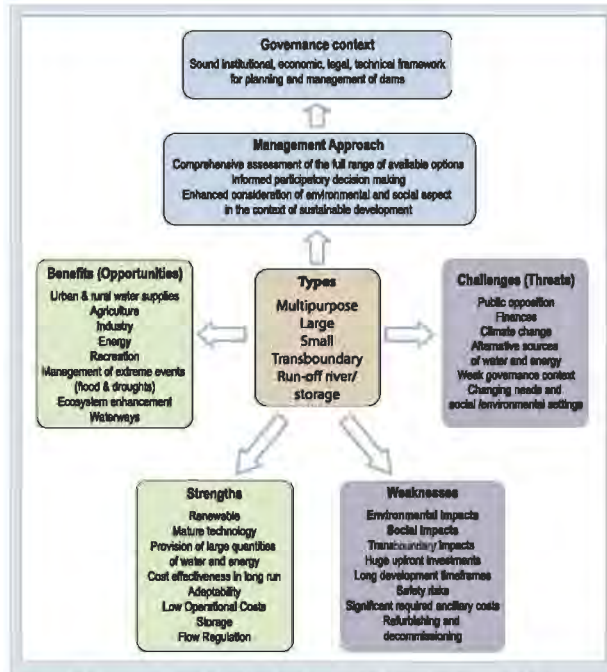


Figure 1.1 Dams and sustainable development: Opportunities and challenges

negatively affected), will need to be taken into account. Projects need to provide development opportunities for all so that ultimately there will be no negatively affected people.

9. Sustainability of dams involves consideration of the engineering, environmental, social, economic and financial aspects of each option, within an informed and participatory decision-making process, and within the project itself once a decision about building the dam has been made. In practice, the

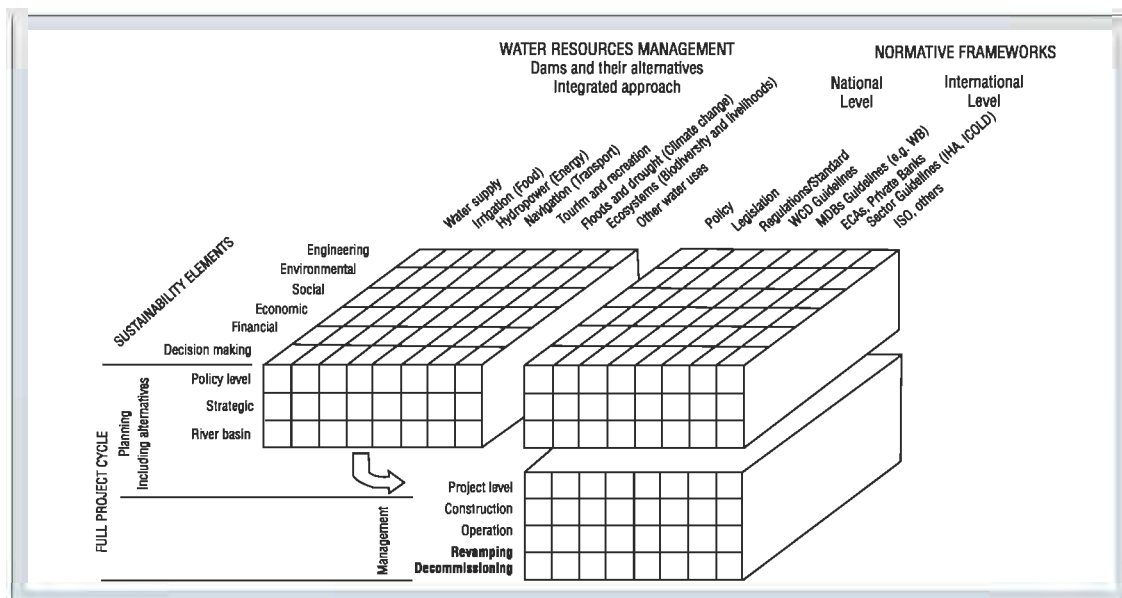


Figure 1.2 Sustainability framework for dams and development

environmental, social, and decision-making aspects of dams are usually less well understood and addressed than their engineering and financial aspects. Hence, any discussion on the sustainability of large water resource infrastructure projects should focus on developing a comprehensive understanding of these issues and the incorporation of this understanding into local normative frameworks and actual practices.

10. In line with increased awareness of the need to better address the environmental, social and decision-making aspects of large dams, and given impetus from the WCD process, some of the most influential actors involved in dams and development, such as financing agencies and industry, have improved the consideration of these aspects in their policy instruments and guidelines (Box 1.3). Many countries have also embarked on improving their normative frameworks.
11. The UNEP Dams and Development Project has facilitated a review of national frameworks through multistakeholder forums and has implemented initiatives that contribute to capacity-building of decision makers on these aspects. This Compendium, which links normative

Box 1.3 Frameworks and instruments supporting consideration of environmental and social issues in development of dams

- Environmental and social safeguards, operational policies and performance standards:
 - Multilateral development banks such as the International Bank for Reconstruction and Development
 - Regional development banks
 - International Finance Corporation
- Export credit agencies' common approaches (e.g. Organisation for Economic Co-operation and Development)
- Private banks (including consideration of the Equator Principles)²
- Tools to assist corporate environmental and social performance, such as the Sustainability Guidelines and Sustainability Assessment Protocol of the International Hydropower Association, and the ISO Environmental Management System standards (ISO 14001).

2 The Equator Principles are a set of voluntary environmental and social guidelines for ethical project finance.

frameworks with practices for a selected set of priority key environmental and social issues, is an important tool to inform decision makers and managers involved in both project implementation and regulation, thereby contributing to promoting sustainable development of dams and their alternatives.

1.1.2 The World Commission on Dams

12. “Dams fundamentally alter rivers and the use of natural resources, frequently entailing a reallocation of benefits from local riparian users to new groups of beneficiaries at a regional or national level” (WCD 2000). As a result, in the 1970s concerns about large dams began to be raised (Goldsmith and Hilyard 1984). Initially focused on environmental impacts and resettlement, these concerns soon extended to other social issues, economics and governance. The increasingly polarized debate and the associated slowdown in dam construction led to the establishment of the World Commission on Dams (WCD) in 1998. The objectives of WCD were to review the development effectiveness of large dams, assess alternatives for water and power development, and develop criteria, guidelines and standards for the planning, design, appraisal, construction, operation, monitoring and decommissioning of dams.
13. WCD concluded that whilst dams have made significant contribution to economic development, in too many cases an unacceptable and often unnecessary price had been paid to secure these benefits. It traced many of the challenges to deficient decision-making processes that were not transparent and participatory, particularly with regards to negatively affected people. In response, it developed a set of recommendations, within a framework of internationally recognized human rights, including the right to development and the right to a healthy environment (WCD 2000, p. xxxiv). They include seven that provide a comprehensive and integrated analytical framework for decision-making on the

provision of water and energy services (Figure 1.3).

1.2 The Dams and Development Project

1.2.1 Phases and activities

14. The WCD report prompted a wide range of reactions. Notwithstanding, a broad consensus was reached on five core values and seven , which were endorsed by all stakeholder groups.³ Further, it was agreed that the national level was most appropriate for further discussion of the decision-making framework recommended by WCD, with a view to its eventual integration and implementation.⁴ The stakeholders recognized the importance of keeping the dialogue initiated by the WCD process alive and preserving its multistakeholder character by maintaining the involvement of all stakeholders, including governments. This led to the establishment of the Dams and Development Project (DDP).

15. Since its inception DDP has facilitated a review of national frameworks through multistakeholder forums and initiatives in approximately twenty countries. Further, promoting global dialogue has been an integral aspect of the DDP core activities. This has been achieved through three main channels: meetings of the Dams and Development Forum, issue-based workshops and convening side events at international meetings. In general, the global dialogue has been useful in catalysing and supporting national and sectoral processes by clarifying key issues and recommending strategies for framing policies, and encouraging the exchange of experiences and lessons learnt.

3 See reactions to the WCD final report in www.unep.org/.

4 In addition to the indicated country-level approach, the WCD report, civil society and other actors emphasized the need to integrate into the WCD recommendations into frameworks of financial institutions and the dam building industry. They also indicated that basinwide and multinational levels were equally relevant to consideration of the issues.



Figure 1.3 WCD core values and : Analytical decision-making framework

16. The five issue-based workshops convened by DDP considered the following topics:

- Gaining public acceptance;
- Options assessment;
- Financing dams and sustainable development;
- Addressing existing dams;
- Ensuring compliance.

17. The workshops produced as their main outputs a set of recommendations and issues to be dealt with at the national level. These are intended to influence policies and procedures to improve decision-making on dams and their alternatives.

18. Based on the outcomes and extensive experience gained during Phase 1, the focus of the second phase of DDP, launched in February 2005, shifted to promoting improved decision-making, planning and management of dams and their alternatives based on the WCD core values and other relevant reference materials. Significantly, one of the core activities for the second phase has been to develop non-prescriptive practical tools that provide information and examples of good practice to assist decision makers, particularly governments, in the planning, development and management of dams.

This Compendium on relevant practices is one of the tools prepared by DDP.

1.2.2 Evolvement of dams and development debate from perspective of DDP

19. The aspiration to meet the Millennium Development Goals puts the need to develop infrastructure high on the political agenda. As the pressure to reach internationally agreed development targets increases, water and energy infrastructure is considered by the political leaders of some developing countries as instrumental in addressing their needs for water, food and energy. For example, at the African Ministerial Conference on Hydropower and Sustainable Development in South Africa, March 2006, there was general agreement on the urgent need to accelerate the implementation of large water infrastructure projects across Africa.⁵ The leaders at the recent G8 Summit in Gleneagles, Scotland, through the launch of the Infrastructure Consortium for Africa, committed a significant amount of development assistance to infrastructure development projects (DDP 2006). Furthermore, the European Union pledged to increase the development assistance volume to developing countries with a significant part going towards infrastructure development projects, with special emphasis on Africa (DDP 2006).
20. At the same time, while stressing the importance of developing water and energy resources and infrastructure, governments have highlighted in almost every relevant international forum the need for enhanced consideration of environmental and social issues, stakeholder participation and alternatives. Commitments towards improving normative frameworks and building capacity to address these issues properly

⁵ Ministerial Declaration and Action Plan of the African Ministerial Conference on Hydropower and Sustainable Development (Johannesburg, South Africa, 2006).

are also captured in the outcomes of these meetings.⁶

21. The core of the debate on dams is essentially about the role of dams in poverty reduction, social justice and the promotion of social and economic development. The existence of alternatives to large dams was highlighted by the WCD report, which recognized the importance of options assessment as one of the in the early planning process. The debate around large dams versus their alternatives takes place within the broader context of the discussion about the merits of small-scale as opposed to large-scale infrastructure. As observed at the DDP session at the fourth World Water Forum in March 2006 (DDP 2006), in most cases the two approaches are complementary, due to their operational features and characteristics. As indicated above, it is only through a careful planning process, which includes the thorough definition of the needs and the assessment of options, that the optimal solutions for water and energy services can be determined.
22. Significantly, during the fourth Dams and Development Forum meeting in October 2005 in Nairobi, a majority of the participants recognized that a qualitative shift in the global debate on dams had taken place, from the previously polarized discussion on whether to build dams or not to a more constructive discussion about how to build “good”

⁶ Some of the most relevant ones are: third World Water Forum and Kyoto Ministerial Declaration (Japan, 2003); International Conference on Renewable Energies in Bonn and its Political Declaration (Germany, 2004); United Nations International Conference on Hydropower and Sustainable Development (Beijing, China, 2004); 13th session of the Commission on Sustainable Development (New York, United States, 2005); World Summit 2005 (New York, United States, 2005); African Ministerial Conference on Hydropower and Sustainable Development (Johannesburg, South Africa, 2006); fourth World Water Forum (Mexico, 2006); 14th session of the Commission on Sustainable Development (New York, United States, 2006).

dams if they emerge as the best option. DDP repeatedly stressed the need to develop specific measures to effectively and meaningfully address environmental and social concerns in the planning and management of dams, and improving decision-making processes for more sustainable outcomes. From DDP's perspective, as indeed also confirmed by outcomes from major recent international conferences, these measures include (a) strengthening normative frameworks and (b) building managerial capacities through, for example, developing non-prescriptive practical tools, such as this Compendium.

1.3 Key characteristics of the Compendium

23. As pointed out above, the Compendium is a non-prescriptive practical tool intended to help decision makers with information when dealing with environmental and social aspects of planning and management of dams and their alternatives. It is not a guideline or a handbook prescribing what is to be done. It is an information tool that describes practices and is meant to inform policy makers, managers and practitioners on what people are actually doing so that these real-life examples of good (and not so good) practice can inspire them when handling local solutions that do things better.
24. This document is a compilation of information about the nature, scope and practice of a limited number of issues with their roots in the WCD strategic priorities. Consideration of these issues is critical to establishing the most appropriate decision-making processes and outcomes. These key issues were arrived at through a systematic process: they were prioritized by the stakeholders at the fourth meeting of the Dams and Development Forum and were based on analytical work supported by DDP since its inception.
25. Annex I provides a detailed description of the process leading to the selection of these issues, the methodological approach adopted for elaborating the Compendium, its intended purpose and use, and the structure adopted for the Compendium. Key features of the methodology are the issue-framework-implementation approach and the extensive multistakeholder consultation. The first involves an analytical process that focuses on issues and their implementation in practice, rather than on strategies or principles. This approach depoliticizes the discussion by placing it at a technical and operational level. It disengages the discussion on the practice of a certain issue from that of the performance of the project as a whole.
26. The stakeholder consultation process was organized through the Steering Committee, the members of the Dams and Development Forum, and the Government Advisory Consultative Group. Consultations were held on the methodological approach, the prioritization of the key issues to be dealt with, the terms of reference for elaborating the issues to be included in the Compendium, the outline of the Compendium and its various drafts.
27. Constraints were inevitably encountered in the process of elaborating the Compendium. These constraints partly emanated from the fact that the issues dealt with were new or emerging, and the related projects were not yet fully developed or well documented, and were still overcoming implementation problems. Other constraints were related to the limitation of the scope of the document to dealing with only a small number of key issues; the limited availability of published and reliable information on good examples of relevant practice; and the necessity to describe examples of implementation without judging or being influenced by the overall performance of the project where the practice has been implemented. In many cases the outcomes of the practice described lacked documented assessment or, if it was available, it was from the perspective of one stakeholder group. This particular limitation resulted in some stakeholders, particularly those from

civil society, voicing the criticism that the views of affected people had not been adequately considered. While a practice might therefore be selected as relevant, assessment of the practice as positive often remained subjective and was left to the knowledge and expertise of the consultant that selected the example.



ZUIDERZEE WORKS, HOLLAND. The Zuiderzee Works are a man-made system of dams, land reclamation and water drainage works, and the largest hydraulic engineering undertaken by the Netherlands during the twentieth century.

28. While limitations are acknowledged, it is important to note that this was a pioneer effort that aimed at putting together for the first time a significant amount of information on good examples of relevant practice and making it available to decision makers, managers and the interested and affected public in the form of a Compendium. This knowledge base constitutes a significant step forward towards the implementation of the WCD strategic priorities. It provides the readers with information about what is actually happening, in both developed and developing countries, regarding practices and frameworks.

29. The following chapters deal with each of the key issues that have been dealt with in this publication. Each chapter presents a brief characterization of the respective issue, its main constituent elements, and a description of how the issue and its main elements have been captured in frameworks and have been taken forward in practice. Some case studies illustrating actual implementation of the issue and its elements are summarized in boxes. The full list of examples studied in detail during the elaboration of the respective background reports are provided in Annex II. The detailed reports prepared from the background studies and the full description of all case studies are accessible at www.unep.org/dams/ under the names of their authors.

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Identification of options

Summary

A decision to build or not to build a dam ideally emerges from a comprehensive and participatory assessment of the full range of policy, institutional and technical options, starting early in the planning process (WCD 2000; DDP 2004a). This chapter deals with the identification of the available options in a given local context, which is an important step in the assessment process and requires careful consideration. This process starts with the assessment of needs and ends with the screening of all options to assess the most appropriate portfolio of actions.

Identification of options, seen in the wider context of a comprehensive options assessment, was prioritized as a result of the fourth Dams and Development Forum recommendations. The identification of options as a separate subject is relatively new in the domain of public literature and debate. In many documents and reports, the identification of options is generally treated as synonymous with comprehensive options assessment. Therefore, the characterization of the issue in this chapter encompasses this wider notion while keeping the focus on the identification element.

Identification of options comprises the collation and validation of the full menu of possible alternatives to meet the expressed needs. The range of options that can be included in strategic planning for water and energy development might vary widely and include structural and non-structural, supply- and demand-side management and efficiency measures. The inventorying of options should pay attention to the scale of the intervention and the different time frames and lead times. Further, each of the options has to be sufficiently described in terms of technical, economic, financial, institutional, environmental and social attributes. This usually entails a certain level of preliminary investigation not exempt from certain challenges. These challenges include disproportionate levels of information available across options and controversies around the basic features of their description that might impact the screening process.

The review done for the Compendium indicates that the process of identification of options in particular, and the comprehensive assessment of options in general, is not fully integrated into national legal and regulatory frameworks. There are few examples of specific provisions in national frameworks to promote and enforce the process. Placing the identification and assessment of options early in the planning process depends on circumstances in each country. Currently, one widely adopted approach is to introduce strategic environmental assessments with appropriate stakeholder involvement. Multilateral and international financial institutions are also developing tools that address the identification of options. A range of instruments, such as the environmental impact assessment process, integrated development planning and country strategy papers, have generally been used as frameworks through which the identification and assessment of dams and their alternatives have been conducted.

Therefore, the identification and assessment of options, including stakeholder involvement, needs to be explicitly embedded in national legal and regulatory frameworks and its practice further integrated into the planning and management of the development of water and energy resources. This would reduce costs, improve stakeholder buy-in and reduce project risks.

2.1 Characterization of the issue

1. The World Commission on Dams (WCD), in its final report (WCD 2000), called for a new framework for decision-making on water and energy development services, highlighting comprehensive options assessment as one of the seven strategic priorities. The framework recommends that decisions on major water and energy projects include a careful assessment of development needs, alternative options, and stakeholder perspectives, and are not to be based solely on the technical merits of a proposed project.
2. An options assessment is part of a decision-making process that works towards identifying the most appropriate options to satisfy defined needs. These processes are conducted at policy, strategic planning and project levels. Comprehensive options assessments (DDP 2004):
 - Are driven by a needs assessment that reflects local, subnational and national goals and is influenced by international commitments;
 - Are transparent and build on explicit assumptions and result in documented decisions;
 - Include the full range of alternatives relevant to the articulated need, such as demand- and supply- side measures, structural and non-structural alternatives, and conventional and non-conventional options;
3. Figure 2.1 illustrates a structured approach drawn from a World Bank study indicating generic steps taken when performing a comprehensive options assessment (World Bank 2003). The process between goals and needs assessment and needs assessment is often an iterative one that typically results in an outcome of a preferred development plan. An appropriate sensitivity analysis or scenario analysis would also be provided to clearly show the range of circumstances where the recommendations are valid. Alternative plans for significantly different scenarios could also be proposed. Similar steps may be used, but in a less extensive way, to assess within-project alternatives during the development and operational phases of a dam.

2.1.1 Needs assessment

4. Assessing the need (demand) for water and energy services in different sectors, and the relationship of these needs to wider development goals, is an essential step in options assessment. Clearly setting out the involvement of stakeholders in the development of goals and needs before proceeding to the identification of the options contributes significantly to the sustainability of the outcomes.
5. The needs assessment does not only consist of demand forecasts, but also includes required levels of access of different beneficiary groups to water or energy services, and in many cases, the levels of service reliability. Needs are not defined simply in terms of growing



Figure 2.1 Typical steps of an options assessment process

demand, but also in terms of a society's development objectives. Consequently, a needs assessment should consider the wider impacts of these services, such as agricultural production, health, equity and other socio-economic impacts or benefits.

6. Depending on the scope and boundaries of the exercise, the needs assessment phase may also identify priority short-term needs. This may lead to a decision by the relevant government authorities to fast-track options to address those needs, while options to respond to mid-term or longer-range needs are evaluated.

2.1.2 Identification of options

7. Identification of options involves the collation and validation of the full menu of possible alternatives to meet the expressed needs. These options include technological, policy and institutional responses, such as demand- and supply-side measures; structural and non-structural alternatives; and conventional and non-conventional options. Options may be categorized further based on whether they contribute to demand-side management, supply-side efficiency, alternative supply options (including rehabilitation and upgrading of existing facilities) and conventional supply options. Identification of options can take place at different planning levels (Box 2.1).

Box 2.1 Planning levels at which identification of options can take place

Policy-level options (policy review and development, reform of the legal and regulatory framework)

Policy makers have to choose the instrument(s) or policy options that enable a country to meet its water and energy and broad strategic and development objectives. Such policy instruments and options contribute significantly in shaping the landscape in which water and energy use and generation options will be identified, adopted and implemented. The government is the key player and takes the lead in and responsibility for identification of options at the policy level. Depending on the governance system, the process of identifying policy options should be consultative with different stakeholders such as major endusers, investors, industry/sector associations and consumer groups.

Strategic/sectoral-level options (master plans, basin plans, poverty reduction strategies, sector strategies, prefeasibility)

There are different methods and techniques used in each sector to assemble options into a plan. In power sector planning exercises, system optimization and simulation models are typically used to prepare least-cost generation expansion plans for different scenarios. For example, a generation optimization model would show how the highest-ranked generation options fit together (that is, which power generation options are selected, in what order, and in what time frame) under different load forecast scenarios. The system models take into account the unique characteristic of each generation option, such as their suitability for base load, mid-range, and peak power generation, and ancillary benefits such as reactive power generation. In more complex planning exercises, a family of different expansion sequences can be produced for each scenario.

In the irrigation sector, farm household models help construct alternative farm configurations, which provide the required livelihood to the farming community. Plans can differ in the degree of dependence on irrigation, in the degree of specialization and in the degree of support for activities being undertaken, such as credit for farm modernization and input supply. Different farm household models may require different amounts of irrigation water supply and hence correspond with different infrastructure options.

In most cases, options for the management of water resources for various end uses will be better performed at the river basin level. This approach is premised on the concept of integrated water resource management and seeks to balance competing uses of finite water resources across sectors and users by recognizing the different uses and users but also the cross-linkages between them. In the case of dams this approach would result in multifunctional projects producing more sustainable outcomes.

The strategic/sectoral planning-level identification of options is usually a government-led process. Sector stakeholders need to be actively consulted to add insights on the local environment and projections of impacts, especially where this is occurring at a basin level.

Project-level options (feasibility, detailed planning, design, implementation and management phases)

For a set of identified needs, there are project options available that can adequately address these. The range of project options varies from increasingly efficient use of available capacity to completely new infrastructure of either dam or non-dam options for supply of water or energy. It is quite rare to have a single intervention; more usual is a portfolio of interventions, each reinforcing the others, with each addressing specific needs and together contributing to different levels of local, regional and national development.

Project-level options will include within a project such options as optimization of capacity, different technical configurations to mitigate environment impacts, and maximization of benefits by addressing some of the developmental needs of locally affected communities. Identification of project-level options is a process led by the promoter but with the government providing the guiding and enabling framework. Affected communities and service end users need to be widely consulted to tap local knowledge.

8. The identification of feasible options and their subsequent assessment are processes that are often demanding. The consideration of the full range of options can be impaired by challenges and constraints that arise from factors affecting societal choices, like natural resource endowments, technological capability, institutional capacity, finance, market conditions, cultural preferences, awareness and education. There are also constraints that prevent more widespread adoption and use of certain options. They might arise from market, policy, institutional, intellectual and regulatory factors; from capacity and resource limitations; from the dominance of conventional approaches and interests in development planning; from lack of awareness and experience with non-conventional alternatives; and from inadequate access to capital and a lack of openness in the planning system. All can hinder or facilitate the identification and assessment of options. A structured approach to the identification and selection processes helps stakeholders to actively participate.
9. Current literature suggests that the process of identifying and assessing options is a learning exercise for the members of a group that may be leading the process. Often, there may be a need to modify or improve criteria, revisit the importance of different criteria or incorporate additional

options. Carrying out all adjustments made within the process in a fair manner will ensure that:

- All options deemed relevant to stakeholders are included in the assessment;
- Options are evaluated fairly and transparently, with the steps in options assessment addressing aspects that stakeholders deem important in a manner that is even handed and understood by all stakeholders;
- Reasons for exclusion or inclusion of options are made clear;
- Social and environmental aspects are given the same significance as technical, economic and financial factors in identifying options.

(a) Investigation of options

10. The range of options that can be included in strategic planning for water and energy development might vary widely. Each sector concerned with planning for water and energy development has its own set of options. Where planning takes place in a basin context, the different sectors, for example power, irrigation, water supply and flood control, provide the options to be considered, as illustrated in Figure 2.2.
11. Within each sector, the array of options can be placed along two axes: structural

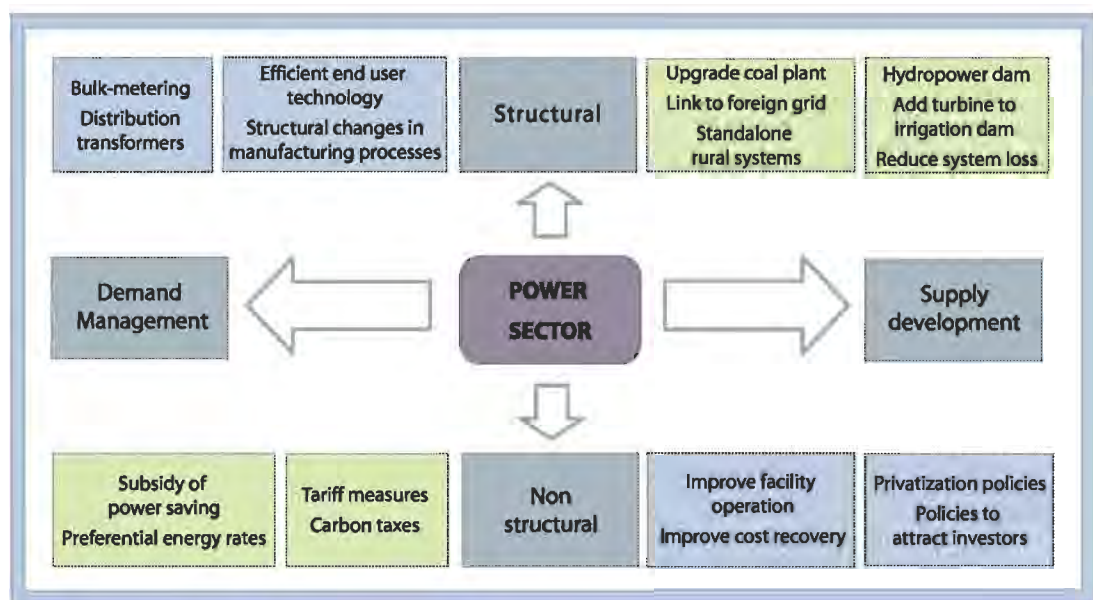


Figure 2.2 Power sector: An example of available options

Source: Adapted from World Bank 2003.

versus non-structural options, and demand management versus supply development options. Within the structural options, further distinction can be made between options that address existing infrastructure and options that deal with new infrastructure. Supply options can comprise conventional as well as non-conventional options. Examples of the latter are the enhancement of local water supply through rainwater harvesting or small infield structures to encourage groundwater recharge (for example contour and infiltration pit systems in Gwanda, Zimbabwe). Wind, solar, geothermal and fuel cell technologies are examples of non-conventional renewable energy supply options to increase local power supply.

12. Current trends assign significant importance to the consideration of supply-side efficiency measures and demand-side management approaches:

- Supply-side efficiency options involve improving system efficiencies on the supply side and can defer the need for new sources of supply by enhancing efficiencies, for example by reducing leaks in agricultural and urban piped water reticulation to reduce losses, or upgrading control transmission

and distribution technology in the power sector. Such supply-side options can reduce water stress and power requirements. They can, therefore, be further categorized according to water use, such as in irrigation, energy or water supply.

- Demand-side management options involve reductions in demand for water and energy through pricing reforms; improvements in source, transmission and end-user efficiency; and educational programmes, which can significantly reduce requirements for new supply infrastructure, or take pressure off supply development programmes. Where a country has low levels of access to water and energy services, as in many parts of Africa, the benefits from demand management may be limited, although they can still play a role alongside new supply development.

13. Better-focused policy and more efficient institutional arrangements can help facilitate development of new supply options, increase supply efficiencies or better manage demand. These policy and institutional options can include cost recovery programmes, new tariff structures, privatization, decentralization and management transfer (Box 2.2).

Box 2.2 EU policy directive for new generation capacity: Preferential support to renewable electricity generation

The European Union has acknowledged the importance of external costs in the production of electricity and has required that measures be undertaken to take these costs into account. The Electricity Directive 2003/55/EC is the key European legislation to establish the internal market in electricity. It gives the European Union and its Member States enough instruments to ensure that security of electricity supply at reasonable prices can be achieved. A number of policy options to internalize the external cost of electricity generation are open to Member States, if exceptional circumstances warrant intervention in the market. The menu involves a wide range of options, including technology- and performance-based command and control, carbon tax, emission permits, subsidies, feed-in tariffs, competitive bidding processes, green renewable certificates, voluntary agreements in the electricity market and green electricity purchases.

A conjoint choice analysis⁷ was applied to the selection of policy instruments in the context of MAXIMA, a project funded by the European Commission that aims to involve policy makers and stakeholders in the debate on the external costs of electricity production.⁸ The project identified through a set of questionnaires and a literature review the information that fed into the conjoint analysis, which was carried out by the Fondazioni Eni Enrico Mattei (www.feem.it).

7 A conjoint analysis is a statistical technique used to discover which combination of attributes or characteristics is most acceptable to different groups of stakeholders.

8 The full title of the MAXIMA project is “Dissemination of external costs of electricity supply: Making electricity external costs known to policy-makers”

14. The inventorying of options pays attention to the scale of the intervention and the different time frames and lead times. Depending on the type of exercise, options may include initiatives at household scale or community scale, as well as larger infrastructure developments. It may mean using options identified in earlier basin- and community-level planning work. To meet both immediate and future needs, options that have different time frames might have to be considered. This requires realistic assessments of the time frame for implementation of supply projects and for the effects of demand-side measures to take effect. Practically, the time frames for needs and long-term solutions may not coincide. Options might have to be identified to address both the immediate pressing needs while providing for long-term and lasting solutions to the identified needs. The result is a mix of immediate steps and actions (project options) and long-term solutions that usually entail a large capital outlay.
15. The case of the Olifants River Water Resources Development project illustrates how, in a basin context, stakeholders identified options for meeting long-term needs but, realizing the time frame it would take to meet these, short-term options were also recommended (Box 2.3).
- (b) Description of the options*
16. Options assessment is a component of planning approaches that assesses all policy, institutional, management and technical options before the decision is made to proceed with any set of programmes or projects. Consequently, the assessment should be based on the respective merits of available options in the given context and involve full integration of social and environmental criteria into the set of technical, financial and economic criteria. Each of the options therefore has to be sufficiently described in terms of technical, economic, financial, institutional, environmental and social attributes. Each option is different and it is not always possible to directly compare one alternative with another. It is nevertheless important that relevant comparisons are made in relation to the basic sustainability of a project (IHA 2004). The description of options entails a certain level of preliminary investigation of the technical, social, economic, environmental and legal or regulatory aspects of the options. The disproportionate level of information available across options usually complicates this.
17. The description of each option might not be exempt from controversies. The extent

Box 2.3 Olifants River Water Resources Development project: Identification of options for different time frames

As part of its mandate to assess national water requirements and in preparation of the National Water Resources Strategy, the Department of Water Affairs and Forestry of the Republic of South Africa did an assessment of water requirements for main water sector users in the Olifants catchment for the period 2002–2020 and beyond. The Olifants River Water Resources Development project was formulated to address the water needs of numerous stakeholders. The main objective of the project was to determine the most suitable options for providing water to meet the current and future water needs of all sectors in the middle parts of the Olifants catchment and in parts of the Mogalakwena and Sand catchments.

Key elements of the project were the identification of the needs of the area through the use of development models, including a high and low water use model. Water requirements under both scenarios indicated that the demand was beginning to outstrip the available water. Options to supply and conserve were, therefore, developed to meet requirements. Investigations showed that a combination of raising an existing large dam plus the construction of a new one, combined with localized small-scale use of groundwater and more reuse of effluents by the mining industry, would result in the project area meeting its water needs over time. However, many stakeholders were of the opinion that new resources should not be developed without ensuring an efficient use of water. Thus, the final recommendations arising from the assessment of the configuration of options involved infrastructural and non-infrastructural components. The latter comprised water-saving measures combined with additional water recycling and reuse, controlled development of groundwater resources and provision for the requirements of the ecological reserve.⁹ The recommendations also addressed institutional arrangements and financial options.

⁹ The ecological reserve is defined in the National Water Act as “the quantity and quality of water required to protect the aquatic ecosystems of the water resource in order to secure ecologically sustainable development and use of the resource”.

of social and environmental impacts, the discount rate, the unit cost of energy or water supplied, the total project budget and the amount of energy or water availed are some of the fundamental parameters for which differences among stakeholders are common and persistent. The development of guidelines and clear processes for validating each of these is essential in the process of identification of options and subsequent screening of options.

(c) Stakeholder participation in identification and assessment of options

18. The identification and assessment of options should be open to all relevant stakeholders, starting from where needs are assessed through identifying the range of options available to meet needs. Participation of stakeholders is based on whether they could be affected by the outcomes of the planning exercise. Their involvement is not only a source of motivation to participate; it also imparts to the project the following characteristics:

- It gives the project legitimacy and contributes to good governance and acceptance of decisions. The process is also enhanced by the greater consensus that often arises from participatory decision-making rather than from narrow interests dominated by a few individuals.

- It reduces investment risk and makes the project more attractive to funding. By giving due consideration to alternatives and to the constructive involvement of stakeholders, beneficiaries of a project are more willing to pay for the services they receive. Investors and funding agents are also more reassured and are more likely to feel that safeguards on their investment policies will be met. This makes the project more attractive to funding.

19. There is now a wide consensus that plans for water and energy development are improved when options are systematically considered and when concerned parties are involved in planning exercises (World Bank 2003).

20. The case study on the Berg Water project in South Africa illustrates how legislation in the country has enabled the active participation of stakeholders in the identification and assessment of options (Box 2.4).

(d) Screening and ranking of options

21. This phase typically consists of two steps: (a) the rapid exclusion of unfavourable options (screening); and (b) the valuing of the remaining options (ranking). The options are assessed against the criteria, so that options that contribute significantly to

Box 2.4 Berg Water project: Stakeholder participation in options identification and assessment

The need to address growing water demand in the city of Cape Town marked a relevant attempt within South Africa to include the full range of stakeholders in decisions affecting water supply and demand. The Department of Water Affairs and Forestry initiated a study, subsequently referred to as the Western Cape System Analysis, between 1989 and 1995 to assess the current and future water needs of Western Cape province. The study was submitted to a consultation process that involved over 1,100 people and numerous organizations. In December 1995 a meeting was held to present to the public the outcomes of the study exercise, the Skuifraam Dam feasibility study and the integrated environmental management process. The process involved initial contact meetings (including capacity-building workshops) and five subregional public workshops and culminated in April 1996 in a 2.5-day conference with over 100 stakeholder representatives. At the conference, guiding principles and criteria to evaluate the options to reconcile demand and supply were developed. Note that these meetings preceded the change in legislation, so this process was developed within the provisions of the previous Water Act (1954) and the principles and practice of integrated environmental management that was high on the development agenda in South Africa at the time.

The Minister of Water Affairs and Forestry commissioned a task group, elected by the stakeholders at the conference, to shortlist the options based on the guiding principles and comparative criteria. Subsequently the task group commissioned some further work and appointed experts to assist them. The process was concluded in November 1996 when a shortlist of schemes for further study, with a view to implementation, was agreed upon and recommended to the minister. Among this list were the Skuifraam Dam and Skuifraam Supplement scheme (currently referred to as the Water Berg project).

the needs and objectives set for the exercise are identified.

22. Typically, when there are many options, there may be an initial stage where they are screened against coarse criteria and reduced to a more manageable number. This screening may include grouping similar options, as well as eliminating options that perform poorly against the screening criteria. For example, options that contradict provisions in national legislation can be excluded at this stage. In the case of the Nepal Medium Hydropower Screening and Ranking project, compliance with the laws on conservation areas required eliminating potential hydropower sites from the project inventory if they were

located in protected parks, conservation areas, and buffer zones. In irrigation development, options that would abstract water from transboundary rivers beyond quantities agreed in international treaties can be eliminated early (Box 2.5).

2.2 Identification of options: Current status in frameworks and in implementation

23. The review of literature done and the examples of implementation identified during the elaboration of the background information provide the basis for the following discussion. Table 2.1 lists the case studies selected to illustrate the implementation of the issue and its main elements.

Box 2.5 Nepal Medium Hydropower Screening and Ranking project¹⁰

With many steep rivers, fed by a combination of snowmelt, winter rains and torrential monsoon rains, Nepal has an estimated 40,000 megawatts of economically feasible hydropower potential. Less than 1.5% has been developed (about 600 megawatts) (IPPAN website).

In 1992, Nepal adopted a National Hydropower Development Policy, which prioritized the development of hydropower potential as a key government objective. As a result a sectoral environmental assessment was carried out in 1996–1997. The primary reasons for using the sectoral environmental assessment were:

- To incorporate environmental and social criteria in the selection of electricity supply options and projects;
- To encourage private sector participation in power development;
- To achieve broad stakeholder participation and a consensus-building approach in order to ensure broad public endorsement and avoid costly delays on all projects, whether implemented by the public or private sector;
- To assist in project optimization and feasibility design, including environmental and social mitigation measures.

The sectoral environmental assessment included a screening and ranking exercise, which focused on developing a quality pipeline of medium-scale hydropower projects in the 10 to 300 megawatt range for domestic grid supply. An inventory of 138 alternative hydropower sites across Nepal was assembled in consultation with stakeholders. A well-structured process using multi-criteria techniques was then employed to select seven of these projects to advance to full feasibility and to subject to environmental impact assessment.

Screening criteria, formulated by the study team in consultation with stakeholders and Nepal Electricity Authority management, were discussed and approved by a steering group. These criteria were published before being applied, and stakeholder comment was invited. The study team did not engage local communities at the screening stage. This shortcoming, however, was a deliberate strategy intended to avoid creating unfulfilled expectations or anxieties in the communities around the 138 sites included in the exercise, which could lead to speculation on land and changes in price. The screening criteria reflected congruence with regional development policies; road construction; transmission line access; hydrology and cost; watershed conditions; World Bank and national safeguard policies on social and environmental aspects; indices such as persons resettled and land take per megawatt; biodiversity impacts; and current level of study.

The Medium Hydropower Screening and Ranking exercise served as input to the formulation of the Power System Master Plan of the Nepal Electricity Authority. In addition, the exercise provided the initial projects for consideration under the Power Development Facility. Feasibility and environmental impact assessment studies have been completed for the Rahughat Khola and Kabali-A projects and can be used as a basis for competitive solicitation to private power developers.

10 The Nepal ranking study was limited to its needs assessment and did not cover the need for off-grid electrification in rural areas not connected to the grid (Stakeholder from NGO advocacy group).

24. The review indicates that the process of identification of options in particular, and the comprehensive assessment of options in general, is not fully integrated into national legal and regulatory frameworks. There are few examples of specific provisions in these frameworks to promote and enforce the process. The South African National Water Act (1998) is one example. The Olifants River Water Resources Development project illustrates the provisions of the legal framework and how it is now shaping the identification and assessment of dams and their

alternatives for meeting water and energy needs in the country (Box 2.3).

25. Legislation such as the Water Services Act (1997) and the National Water Act in South Africa – requiring participatory planning and public consultation as inputs to all major water management decisions at local, provincial and national levels and compelling promoters to ensure stakeholder participation in the identification and assessment of options – represent cutting edge mechanisms to ensure that the best options are identified.

Table 2.1 Main elements of identification of options addressed by the selected case studies¹¹

Case study	Needs assessment	Identification of options			Selection/ranking of options
		Investigation of options	Description of options	Stakeholder participation	
NELSAP strategic social environmental assessment		Investigation of power development options for Nile basin countries	Description of both dam and non-dam options for meeting energy needs		Ranking of least-cost options for power development in the NELSAP countries
Community-based planning, Gwanda	Community-level matching of needs and options for meeting water and energy needs		Household-level water harvesting and soil conservation technologies		
Berg Water project				Stakeholder participation in the validation of preliminary identification of options	
Olifants River Water Resources Development project		Identification of options for immediate needs and different stakeholders			
Goulburn-Broken Irrigation Futures options			Dam and non-dam options for increasing agricultural production		
Nepal Medium Hydropower Screening and Ranking project	Geographical balance of hydropower generation options			Stakeholder participation in identifying additional options and ranking criteria	Ranking criteria for medium-scale hydropower development
EU policy measures for renewable energy		Policy directives to identify and promote renewable energy options for new generation			
British Columbia water use planning guidelines				Stakeholder participation in selection of dam operating regime	
Ceara Integrated Water project		Staged development and selection of dam options for meeting water needs			

11 This table illustrates the main elements of the identification of options in the context of comprehensive options assessment addressed by the selected examples. The main elements considered reflect those identified in the characterization of the issue. For more detail, see the case studies in the final report on the issue. The blue boxes indicate use of the approach, and the green boxes indicate that the consultant considers the example to be a particularly informative application (Practical Action 2006).

Similar legislation and regulations elsewhere (Bangladesh, Brazil) have promoted the development of water resource management plans and basin- and regional-level water service development plans through multisectoral, multistakeholder processes that intend to harmonize demands and maximize cross-sectoral benefits.

26. Placing the identification and assessment of options early in the planning process depends on circumstances in each country. Currently, one widely adopted approach is to introduce strategic environmental assessments with appropriate stakeholder involvement. A strategic environmental assessment process enables the identification of environmental, social and economic concerns and the resolution of competing needs. This process is a mechanism by which sustainable development and global trends concerning environmental goals can be reconciled with the management and conservation of natural resources. The process would function most effectively as a participatory, streamlined process, focused on major issues, using common sense and readily available information, and with short and

definite time limits for its completion. Strategic environmental assessments generally provide a broad assessment of priorities and identify the critical issues likely to surface in subsequent steps of the planning procedure (Box 2.6). Where strategic environmental assessments generally concentrate on the physical environment and sustainable resource use, social impact assessments have a similar role but assess social issues, particularly issues of equity. Social impact assessments are dealt with in detail in Chapter 5 of this publication.

27. Multilateral and international financial institutions are also developing tools that address the identification of options. The requirement of the International Finance Corporation for a detailed hybrid strategic and social environment assessment is an example of practice in guiding the identification and assessment of options.
28. A range of tools, such as the environmental impact assessment process, integrated development planning and country strategy papers, have generally been used as frameworks through which the

Box 2.6 NELSAP strategic social and environmental assessment for power development options

Following dialogue between the Nile equatorial lakes countries and the World Bank, the need for a comprehensive strategic regional assessment of different power options was formulated for the region, building on the ranking study of hydropower options identified by the Nile Equatorial Lakes Subsidiary Action Programme (NELSAP). The approach to undertake a broad-based power options analysis, including issues to be covered in a strategic/sectoral, social and environmental assessment, was agreed by power experts from the Nile equatorial lakes region in May 2002. The objective of this assessment was twofold:

- To prepare the World Bank and other investors for possible requests to support the NELSAP power development programme;
- To assist the riparian countries of the Nile equatorial lakes region in their selection of power supply options (including interconnections) by contributing to informed and transparent decision-making before major funds to investigate individual options are committed.

The assessments covered the current situation in the region; a review of energy policies and legal and administrative frameworks as they apply to the promotion of power development options; an assessment of the power needs; the identification and screening of power development options; a comparative analysis and ranking of power development options that were retained after screening; the development of portfolios of power options; an overview of cumulative impacts on the region of the development of such portfolios; and the definition of mitigation measures that can be applied to reduce the social and environmental impacts of these portfolios.

As the assessment was a regional study, it was implicit that the process would be based on energy demands and supply options for the interconnected systems. However, information has also been provided on some off-grid options such as solar photovoltaic power, mini/micro hydropower, wind energy conversion systems and diesel. Indicative costs and potential applications for these options provide useful contexts for assessing costs and performance of on-grid options that are the target of the assessment. The potential for demand-side management to reduce new generation requirements was also noted.

Through a review of previous studies and extensive stakeholder consultation, the assessment was able to compile a strong set of recommendations with 330 megawatts capacity (one 30-megawatt gas facility and three hydro schemes for the balance) at four different locations. Recommendations were made for further studies on other generation options (Nile Basin Initiative 2005).

identification and assessment of dams and their options have been conducted. The International Energy Agency has produced generic recommendations on how governments might incorporate the assessment of options into national power sector policies and regulatory frameworks (IEA 2000).

29. The International Hydropower Association has produced sustainability guidelines addressing principles of options assessment as well as assessment criteria. It considers broad energy options assessment to be the responsibility of national or regional governments as part of their energy development strategy. Governments and, where applicable, project proponents will apply sustainability criteria when comparing project alternatives in order to focus on options that maximize environmental, social and economic benefits and, conversely, eliminate unacceptable alternatives early in the planning process. Each option is different and it is not always possible to directly compare one alternative with another. It is nevertheless important that relevant comparisons are made in relation to the basic sustainability of a project. However, an infinite variety of options is never available and, therefore, fundamental factors such as affordability, resource availability and scale of requirements define the possible options that need to be assessed (IHA 2004).

30. The use of simulation and other models is becoming a key tool in enhancing stakeholder participation and forecasting impacts. This is now widely used, especially for dam options concerning downstream flow operations.

2.3 Conclusions and recommendations

2.3.1 Conclusions

31. Key trends and issues in the identification of options are as follows:

- Ideally, identification of options is iterative but this is not always possible given that it may be costly

and impractical in some instances. In such a case it needs to be taken into account that the identified options are time sensitive and valid within a certain framework of conditions and time.

- Identification of options processes generally depends on previous studies to carry out a preliminary screening of unfeasible options early on. Different options have varying levels of publicly available information that leads to differential preferences. There is an inherent risk that the more detailed projects that have undergone detailed feasibility studies get more attention at the expense of unconventional options, demand-side management or supply-side efficiency measures. This usually happens with large-scale commercially oriented projects that receive more detailed investigation compared to small-scale decentralized developmental options. This disparity in levels of interest leads to information asymmetry when comparing the two, with more known about the more detailed (large-scale) options and very little about the other, as exemplified by the NELSAP case (Box 2.6).
- Policies and regulatory frameworks, in each context, are key in shaping which options are identified and promoted. Levies, taxes, credits, preferential tariffs, and targeted grants are all types of instruments that are used by governments to promote the identification and selection of some options over others. Ideally these would be directed towards promoting environmentally friendly options for meeting water and energy needs. The European Union Directive on Electricity Generation is one of such instruments described in this study (Box 2.2).
- Conditionalities and safeguards set out by multilateral financing organizations have been effective in improving the process of identification of options.
- The environmental impact assessment process, if started early in the planning cycle, is a useful starting point in enforcing a detailed process of comprehensive options assessment through legal and regulatory instruments.

2.3.2 Recommendations

32. Recommendations concerning the identification of options are as follows;

- The identification of options is ideally undertaken early in the process of development of water and energy services. This would reduce costs, improve stakeholder buy-in and reduce project risks.
- An iterative process, occurring within a time-bound period to ensure that concrete decisions are made and needs addressed, will ensure that the most recent advances in technology and knowledge base are included.
- Stakeholder participation is central to gaining legitimacy for the options identification and assessment process.
- Quite often, it is not one option that will be selected but a mix of options to cater for the needs of different stakeholders and time frames.
- The identification and assessment of options, including stakeholder involvement, needs to be explicitly placed in legal and regulatory frameworks dealing with the planning and management of the development of water and energy resources. The development of guidelines, for

example water use planning guidelines (see Box 2.7), might be a useful starting point, with the medium-term objective of progressing to formal regulatory and legal embedding and enforcement.

- Donor and financing conditions and safeguards could be used to encourage both governments and private developers as part of an international and external framework to promote a detailed process of identification and assessment of options.

2.4 Case studies

33. Annex II provides a list of the case studies selected to illustrate the issue, indicating the main elements, frameworks and examples of implementation. Additional information and a detailed description of the examples mentioned in this chapter can be found in the report of the consultant (Practical Action 2006).

34. The examples illustrate a set of practical approaches regarding the identification of options in relation to dams and other alternatives, and examine the issue along the project life cycle as well as at the different levels of policy, strategic planning and project. These examples provide a fair

Box 2.7 British Columbia water use planning guidelines: Identification of options for dam operating regime to address stakeholder interests

The development of water use plans for power and other water control facilities¹² is carried out as part of the licensing procedure of the British Columbia Water Act.

Water use plans are prepared through a collaborative effort involving the existing or prospective licensee, government agencies, First Nations (indigenous peoples), other key interested parties and the general public. Draft plans are submitted to the Comptroller of Water Rights for regulatory review and approval. As much as possible, the goal of the water use planning process is to achieve consensus on a set of operating rules for each facility that satisfies the full range of water use interests at stake, while respecting legislative and other boundaries.

In the application on the 33-megawatt Clowham hydro plant, the conclusions reached were that:

- The British Columbia water use guidelines provide a structured consultative planning process involving all stakeholders to find a better balance between competing water uses;
- The water use plans prepared by BC Hydro demonstrate that the planning process effectively allows for stakeholders to identify and explore the implications of a range of facility operating alternatives relating to water use objectives;
- Most of the water use plans resulted in consensus among stakeholders. Where no consensus was reached on a single operating alternative, active monitoring and adaptive management were initiated to test alternative flow regimes (Ryder 2005).

12 Works are defined in the Water Act and include facilities for diverting, storing, measuring, conserving, conveying, retarding, confining or using water” and “producing, measuring, transmitting or using electricity”.

picture of the current status and thinking on the identification of options involving national and international experiences.

36. The consultant's report (Practical Action 2006) contains an extensive set of references, including internet links, to the

sources of information identified during the elaboration of the characterisation of the issue and the examples of implementation. The report, which is open to comments from the public, can be accessed in the DDP website at www.unep.org/dams/



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Stakeholder participation

Summary

This chapter deals with the issue of stakeholder participation, which is key to improving decision-making and governance in the planning and management of dams and their alternatives (WCD 2000). The issue has a special and cross-cutting role in processes concerning dams and their alternatives, including in all nine priority key issues dealt with by the Compendium.

In the available literature, definitions of stakeholder participation generally relate to stakeholder input influencing decisions. The approach reflected in the “spectrum of public participation”, developed from the experiences of practitioners, is seen as alternative to the “the business as usual” mode in which a decision is made, announced and defended.

Four key elements and mechanisms of stakeholder participation are discussed: stakeholder analysis and participation plans; techniques and tools; financing; and timing. Building on the World Commission of Dams framework, practical ways of identifying stakeholders and realizing the benefits of participation are presented, with techniques and tools tailored according to their intended purposes and suitability to stakeholders. Determining a reasonable level of financing can be informed by the consultation plan to ensure implementation with appropriate skills, time and resources. Finally, there is a need to engage stakeholders early and throughout the project, allowing adequate time for participation.

The chapter notes that stakeholder participation needs to be grounded in legislation for minimum requirements to be met. Examples of international guidelines and national legislation are provided. The role that corporate and NGO safeguards have played is also discussed. Regarding implementation, the chapter notes that as numerous cases had to be reviewed to identify a few useful examples, there is limited successful practical application, particularly in developing countries. It highlights commonly identified barriers to participation, as well as the advantages. A limiting factor of successful participation has been that, in some cases, there are no specific budgets for stakeholder participation. In spite of this innovative mechanisms were found, in particular the benefit of interactive tools. The cross-cutting nature of stakeholder participation is illustrated through examples dealing with diverse issues. Finally, the lack of independent evaluation inhibits learning and continuous improvement.

The chapter concludes that there are some excellent regulatory frameworks on which to ground stakeholder participation and a wide range of cost-effective techniques for engaging communities to improve decisions. The techniques are however not widely and consistently applied, globally and within all stages of dam projects. Recommendations proposed include increasing commitment to the adoption of basic legislation and guidelines, and resourcing of stakeholder participation. The objective evaluation of participation will promote better understanding and improvements. Capacity-building in skills and techniques is essential to achieve effective stakeholder participation.

3.1 Characterization of the issue

1. Stakeholder participation is defined as “any process that involves stakeholders in problem-solving or decision-making and uses stakeholder input to make better decisions” (Baldwin and Twyford 2006).
2. This definition highlights that stakeholder participation is a process or series of actions, impacts and outcomes and not one single activity. It clarifies that the ultimate aim of stakeholder participation is better decisions, that is, decisions that are better informed, more sustainable, owned by stakeholders and implementable. Other commonly accepted definitions reflect a similar concept – that of stakeholder input influencing decisions (Sidaway 2005). Importantly, stakeholder participation recognizes the decision-making role of government and seeks to clarify the roles that stakeholders can play to contribute to better decisions.

3.1.1 Stakeholder participation: Effective approaches

3. Based on the experiences of practitioners of what has worked well and what has not, effective approaches to stakeholder participation accommodate such concepts as core values and the spectrum of public participation.¹³
4. The core values of the International Association for Public Participation (IAP2) describe seven attributes of a stakeholder participation process that need to be observed to meet the minimum standards essential to delivery of a fair and ethical process (Box 3.1). These values were used to guide the selection of case studies considered to be good examples illustrating relevant practices.

Box 3.1 IAP2 core values of stakeholder participation

- Stakeholders have a say in decisions about actions that affect their lives.
- Stakeholders’ contributions genuinely influence decisions.
- Sustainable decisions are achieved by meeting the needs of all participants, including the decision makers.
- The involvement of those potentially affected is sought out and facilitated.
- Participants are involved in defining how they participate.
- Stakeholders are provided with the information they need so they can participate in a meaningful way.
- Stakeholders are informed how their input influenced the decision as a result of their participation in the process.

5. The spectrum of public participation describes how participation can be effective at five different levels (Figure 3.1).¹⁴ At each level, the goal of participation, the promise to the public and the techniques used will be different. There is an increasing level of public impact on decisions at the higher levels of the spectrum. Managing the expectations of both decision makers and stakeholders is challenging. A mismatch of expectations can occur when decision makers intend to inform or consult stakeholders, as is often the case in decision-making on dams, while stakeholders seek to collaborate in decision-making. This approach departs from the business as usual approach characterized by a situation where a decision is made by the proponent, announced to the public and then defended.¹⁵ This model rarely results in good decisions and frequently results in impulsive reactions that can be costly to the decision maker and increase stakeholder cynicism about the transparency and authenticity of the decision-making process.

13 These concepts and approaches were developed by the International Association for Public Participation (IAP2). See www.iap2.org.

14 See www.iap2.org/associations/4748/files/spectrum.pdf.

15 This approach is often referred to as the DAD model. The acronym stands for “decide, announce, defend”.

INCREASING LEVEL OF PUBLIC IMPACT

INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
Public Participation Goal To provide the public with balanced and objective information to assist them in understanding the problems, alternatives and/or solutions	Public Participation Goal To obtain public feedback on analysis, alternatives and/or decisions	Public Participation Goal To work directly with the public throughout the process to ensure issues and concerns are consistently understood and considered	Public Participation Goal To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution	Public Participation Goal To place final decision-making in the hands of the public
Promise to the Public We will keep you informed	Promise to the Public We will keep you informed, listen to and acknowledge concerns and provide feedback on how public input influenced the decision	Promise to the Public We will work with you to ensure that your concerns and issues are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision	Promise to the Public We will look to you for direct advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible	Promise to the Public We will implement what you decide
Example Tools Fact sheets Web sites Open houses	Example Tools Public comment Focus groups Surveys Public meetings	Example Tools Workshops Deliberate polling	Example Tools Citizen advisory committees Consensus-building Participatory decision-making	Example Tools Citizen juries Ballots Delegated decisions

Figure 3.1 IAP2 spectrum of public participation

3.1.2 Main elements of and mechanisms for stakeholder participation

(a) Stakeholder analysis and participation plans

6. The process of identifying key stakeholders is referred to as stakeholder analysis or stakeholder mapping. There is a variety of ways to identify stakeholders. The terms “any interested parties” or “the public” can be used in legislation to provide a broad and inclusive view of who can be involved (Machado 2001). While this includes more than those directly affected, for the purposes of designing a participation programme, it is more helpful to government or dam proponents to proactively identify certain stakeholders to be included or targeted for their views.
7. The WCD final report recommended a “rights and risk” approach to identify the stakeholders, with focus on the “rights at risk” (WCD 2000). The concept of “responsibility” was later added in response to the dialogues promoted by DDP to complete what is known as the RRR

approach – rights, risks and responsibility (Bird, Haas and Mehta 2005, p. 1–3).

This evolving approach also provides an overall framework to help structure and inform the development of participation guidelines. For a planning or development project, Sarkissian and others (2003) provide some practical questions that could be considered to identify stakeholders, as follows:

- Whose work or life will be positively or negatively affected?
- Who lives close to the location of the proposed project?
- Which organizations and activities might be affected?
- Who might be affected by changes to their customary habits, activities or routes?
- Whose values and interests may cause them to care about an activity?

8. The regulation applying to the Ribble River basin pilot leaves little ambiguity about who are the stakeholders. It identifies the

persons in the river basin to be consulted for river basin planning as nature conservation bodies; every local authority and local planning authority; any national park authority; relevant harbour, navigation, water and sewage authorities; fisheries committee; business interests relying on water; those with an interest in the protection of water environment and flood management; and any others the agency thinks fit.

9. It is advantageous to carry out a stakeholder analysis with members of the community to gain consensus on who are the key stakeholders, make sure no one is left out and, if possible, to identify preferred mechanisms for engaging each interest group. Mechanisms for engagement need to reflect the objective of the consultation, the role of each stakeholder group and any particular needs of the group. For example, a fishing community might be able to contribute detailed information about fish diversity and habitat to the environmental impact assessment (the “objective of consultation”). On the same project, an international NGO might contribute ideas about practices elsewhere when discussing options. This would influence when in the process this input would be gained, and what techniques to use (such as face-to-face interviews for the former and a workshop for the latter). Special needs will be taken into account as well when designing a consultation programme, such as literacy, language, working hours, income, age (young and seniors), physical

disability, and gender (Sarkissian and others 2003, p. 49).

10. A participation or consultation plan should be developed early in the process, incorporating outcomes of the stakeholder analysis. It can be used for the following:
 - To gain commitment and agreement by decision makers on the stages, purpose and time frame for participation;
 - To be transparent about the decision-making process for participants;
 - To select the level of participation and clarify participation goals, objectives and promises at each step;
 - To identify appropriate techniques for categories of stakeholders;
 - To identify resources needed and length of time for each stage of the process;
 - To identify and incorporate evaluation methodology at an early stage.
11. A consultation plan can be provided to possible participants for feedback on how they would like to be engaged, and to identify whether stakeholders have been overlooked. It reinforces the need to clarify the scope of the decision and the level of influence stakeholders can have, and to understand the stakeholders and issues before determining stakeholder participation methods and tools. Plans should be in place at the start of the participation process, and be sufficiently flexible that they can be responsive to the needs of stakeholders. The Wivenhoe and Ribble basin case studies offer examples (Box 3.2 and Box 3.6).

Box 3.2 Communication plan for upgrading Wivenhoe Dam, Queensland, Australia

The alliance formed to upgrade the water supply from the Wivenhoe Dam, on the Brisbane River, Australia, developed a communication plan that identified all stakeholders, established key messages and issues, and documented and justified engagement techniques, key activities and time frames. Stakeholders were identified through project planning workshops, site visits and an existing database of local residents, traditional owners, interest groups and local, state and federal government agencies. Core actions, such as newsletters, an information line and media releases, were identified, supplemented by additional activities tailored to specific interests. The plan included communication protocols. For example, all activities involving negotiations with traditional owners were managed through the stakeholder manager. The plan called for a community reference group to be formed and engaged early in the process. It also included mechanisms for community feedback, such as a questionnaire distributed with the newsletter. A stakeholder and environment plan complemented the communication plan by identifying risks and constraints, including the need to focus on negotiation with traditional owners, regular liaison with the government stakeholder group, identifying and implementing benefit sharing for the construction phase, and achieving non-cost key performance indicators.

(b) Techniques and tools

12. Techniques need to be selected based on the stakeholder participation objectives, stakeholder preferences, the languages and cultures of the stakeholders, the resources available, including money, time and skills, and the size and complexity of the project. The choice of technique or mechanism should not drive the process but would be adapted to it. There are many mechanisms for engaging stakeholders in decision-making; Table 3.1 shows three categories of tools that can be used to achieve the targeted objectives.¹⁶ All of the case studies used tools to share information at a minimum and all used tools that gathered data or enabled interaction.

13. Three case studies (Box 3.3) illustrate effective tools used for engaging vastly different groups of stakeholders:

- Computer-based decision support tools for well-educated computer-literate participants with high expectations of influencing outcomes in the TVA Reservoir Operations Study, United States;
- Surveys and local expert panel of poorly educated fishing communities as part of the Thai Baan research project struggling to be recognized in response to the Pak Mun Dam trial gates opening, Thailand;
- Public assemblies, joint study groups and resource centres facilitating information sharing and interaction through a partnership approach formalized by an agreement with the Cree community in James Bay, Canada.

(c) Financing

14. Good practice requires a realistic budget to be set during the scoping stage for any dam project, covering the following activities as a minimum:

- Participation planning;
 - Development and distribution of effective communication materials;
 - Some deliberative activities that

Table 3.1 Techniques and tools for stakeholder participation

Tools to share information	Tools to gather and aggregate data	Tools to enable interaction
<ul style="list-style-type: none"> • Media advertising • Newsletters • Open house displays • Websites • Briefings • Public exhibitions 	<ul style="list-style-type: none"> • Surveys • Comment forms • Interviews • Focus groups • Public hearings • Review panels 	<ul style="list-style-type: none"> • Workshops • Discussion groups • Public meetings • Ongoing stakeholder committees

enable stakeholder engagement with the technical information;

- Data gathering from stakeholders;
- Processing data into useful information for decision makers;
- Provision of ongoing feedback to stakeholders on how decision makers used the information.

15. Preparing a sound consultation plan can assist in determining costs for participation and in gaining agreement on the budget. Unpublished research among practitioners concerning participation budgets indicates that budgets established as a percentage of the total project budget are typically in the order of 1% or 2%.

16. When negotiating finance for a project, it is essential to ensure there are sufficient resources for adequate stakeholder participation to be undertaken by people with appropriate skills or to include time and resources to build appropriate capacity.

(d) Timing

17. Good practice supports the early provision of information on the scope of the decision to be made. It is more effective to provide information early, even when the details of the proposal are incomplete and it is necessary to acknowledge that there is much that remains unknown. Stakeholders need information throughout the entire project life cycle. They are more likely to be able to process that information if it is provided in small amounts on a regular basis rather than as one complete document at the end. It is also important to provide sufficient and timely opportunities for stakeholders to engage with the information and to discuss it with people they trust.

¹⁶ IAP2; see www.iap2.org/.

Box 3.3 Tools for engaging different groups of stakeholders: Case studies

Tennessee Valley Authority (TVA) Reservoir Operations Study

(Purpose of tools: To enable interaction)

The goal of the Reservoir Operations Study was to determine whether changes in TVA's reservoir operating policies would result in greater overall public value (for power, water supply, navigation and recreation). It included broad public outreach, community workshops (involving more than 3,000 people), targeted multistakeholder groups, an interagency team and a public review group. Alternatives were developed, evaluated and refined through data collection, statistical analysis, computer hydrologic modelling and qualitative assessment. An interactive computer-based system was used for multivoting on preferences and to encourage and record comments, which could be displayed electronically on a screen so that all could see the range of opinions. This facilitated interaction among interest groups and an understanding of the need to balance concerns.

Villager-led Thai Baan consultation

(Purpose of tools: To gather and aggregate data)

This case study focuses on villager-led research supported by an NGO, the Southeast Asia Rivers Network, involving work with local communities to inform and consult post-construction on the mitigation of impacts related to the Pak Mun Dam, Thailand (Chinvarakomu 2002). The Pak Mun project is located on the Mun River, a tributary of the Mekong River, and incorporates a 123 megawatt hydropower plant. The research initially focused on the impact of opening the dam gates but was extended to cover broader issues. The methodologies applied to study each issue involved observation, in situ recording of field observations, validation of data by local experts, and data classification and analysis. The Thai Baan researchers included 200 villagers from 65 communities nominated to collect data by the local communities for their expertise in different fields. They received no remuneration and were assisted by NGO advisers. The research demonstrated the impact on the fishery downstream of the dam and the inadequacy of compensation. This case study illustrates the cost-effective contribution that poorly educated people could have made if included in earlier stages of the impact assessment and development planning. According to civil society representatives, it also illustrates the important role the participation of affected people could play in finding solutions.

Eastmain 1A-Rupert diversion, James Bay, Canada

(Purpose of tools: To enable full participation)

The Eastmain 1A-Rupert diversion involves the Eastmain and Rupert Rivers in Canada. This 770 megawatt project aimed to augment existing generation of power by diverting some water from the Rupert River and constructing two other powerhouses at an already developed site. The river is of significant cultural value and runs through the territories of six indigenous Cree communities. A series of informal meetings and public assemblies with senior Hydro-Québec managers and Cree leaders and the communities and a signing of a nation-to-nation agreement between the Cree and the government of Quebec resulted in the Boumhounan Agreement in 2002, which confirmed a partnership approach. The indigenous Cree were then involved at all phases of the project, from the concept onwards. The Cree provided ecological and traditional knowledge, and participated in a joint study group and field investigations to conduct environmental and social impact assessment data gathering and analysis.

The process was supported by locally employed Cree coordinators and fully equipped information and work offices in the communities, which provided a continuous forum for exchange, access to information and videos translated into Cree language. The Cree were afforded time (more than three years) and financial resources to assess, consult and understand the nature and scope of the project, and were assisted by specialists and lawyers. Special funds were provided for a joint non-profit corporation for construction of remedial works and implementation of mitigation measures, and economic and community benefits such as training, employment, contracts and environmental guarantees.

Under Canadian and Quebec legislation, a review panel comprising experts, including Cree representatives, held public hearings in the six Cree communities affected and in the cities of Chibougamau and Montreal. Hearings encouraged an exchange of views and commenced more than 45 days after public release of the impact statement, translated into relevant languages. In all, participation methods ranged from face-to-face meetings with key individuals, large public assemblies, joint data gathering groups and field trips, collaborative discussions about project design and the development of economic benefits, and more formal public review procedures where views of all parties could be shared. Civil society representatives noted that this case also illustrates how the principle of free, prior informed consent led to the success of the initiative.

18. Most legislative frameworks addressing stakeholder participation set out minimum time frames for review and response to development proposals – frequently 28 days. In reality IAP2 experience is that a much longer period (for example 90 days) is preferable. One month is not sufficient time for interest groups anywhere (especially vulnerable groups) to work together to understand the information and to provide an agreed response on a major proposal. The Gaining Public Acceptance workshop convened by DDP (Nairobi, October 2005) suggested a minimum time frame of at least six months to enable stakeholders to process the information, and to give sufficient time to enable people to effectively and meaningfully participate. It also suggested that it be based on time lines and formats mutually agreed with stakeholders (DDP 2005).

3.2 Stakeholder participation: Current status in frameworks and in implementation

19. The review of literature and examples of implementation identified during the elaboration of the background information provide the basis for the following discussion. Table 3.2 lists the case studies selected to illustrate a range of mechanisms and tools for effective stakeholder participation.

3.2.1 Regulatory frameworks

20. A commitment to stakeholder participation in dams and development needs to be grounded in legislation to ensure that at least minimum requirements are met. In the experience available of participation professionals, legislation related to river basin or infrastructure planning and development assessment would specify, as a minimum:

- The objective of participation, e.g. to improve decisions, or to obtain the support of affected parties;
- Information to be released for public comment, e.g. environmental impact assessment, technical information;
- Amount of time for public review and

comment at certain phases, e.g. 90 days;

- Formal mechanism for seeking public comment, e.g. submissions, hearings, community advisory committees;
- How community input may be used, e.g. compiled in report to decision maker, considered by decision maker, made publicly available;
- Who would be notified, e.g. those directly affected, or the public, whose input will be accepted in legal proceedings (of legal standing) such as appeals or hearings involving interested parties.¹⁷

22. In two case studies reviewed, a combined package of legislation and guidelines led to comprehensive direction on stakeholder participation: the National Water Act (1998) and the Department of Water Affairs and Forestry's guidelines on public participation in South Africa; and the non-legally binding European Union Water Framework Directive (Guidance Document No. 8) and the Water Resources England and Wales: Water Environment (WFD) Regulations, 2003, applied to the Ribble River basin. The latter specified public participation in river basin management, including steps in notifying the public, identifying stakeholders, information to be made available publicly, and notifying the public about how public representations had been taken into account. The South African guidelines are described in Box 3.4.

¹⁷ Water Resources WFD England and Wales Regulations and National Water Act, South Africa.

Table 3.2 Main elements of stakeholder participation addressed by the selected case studies¹⁸

Project	Stakeholder analysis and consultation plan	Features of tools and techniques	Financing for stakeholder participation	Timing	Level of participation spectrum
Coquitlam upgrade		Committee, indigenous support, expert panel, consultation officer	US\$350,000 Indigenous issues funded	Commenced prior to and continued after upgrade	Consult, collaborate
Nam Thuen 2 resettlement		Resettlement committees		Stakeholder participation capacity-building at resettlement phase	Inform, consult
Eastmain A1		Partnership in joint discovery social and environmental impact assessments		Long-term commitment started at the beginning of the planning stage	Inform, collaborate, empower
Andhikhola electrification		Village development committees, user organizations, baseline household survey			Inform, consult
Wivenhoe upgrade		Indigenous support, community reference group, evaluation with key performance indicators	\$913,850 incl. \$600,000 benefits	Commenced early and continued after upgrade	Collaborate
Ribble River basin planning		Stakeholder forum, information and communication technology tools, independent evaluation		Early input to consultation plan	Involve
Tennessee Valley Authority ROS		Multistakeholder forums, public review group, interactive computer, modelling and feedback	10% of \$10 million project (incl. river modelling, information and communication technology)	Stakeholders contributed to scope of study, option analysis	Inform, collaborate
Olifants River Water Resources Development project		Interest groups, NGO focus group, issues and response report, feedback on process			Inform, involve
Manapouri monitoring		Issue-based focus groups, indigenous working party		Long-term relationships	Collaborate
Upper Kotmale hydropower		Socio-economic survey, committees for resettlement, housing, environmental monitoring	\$60,000	Long-term process	Inform, consult
Jondachi hydropower prefeasibility		Representative board		Early in process	Inform, consult
Salto Caxias resettlement		Multidisciplinary study group	\$250 million – mitigation of impacts	At resettlement stage	Inform, collaborate
Thai Baan consultation		Consensus-based research and monitoring, local experts and researchers			Collaborate

18 This table illustrates the main elements of stakeholder participation addressed by the selected examples. The main elements considered reflect those identified in the characterization of the issue. For more detail, see the case studies in the final report of the issue (IAP2 2006). The blue boxes indicate use of the approach, and the green boxes indicate that the case study is a particularly informative application. For simplicity, only a few participation tools and techniques are included.

Box 3.4 South African Department of Water Affairs and Forestry guidelines for public participation

In 2001, the South African Department of Water Affairs and Forestry introduced a set of generic guidelines for public participation that responded to the National Water Act (1998) and the Water Services Act (1997). The following 16 principles were described as a way to enhance participation in water management decisions:

1. Inclusive involvement of stakeholders
2. Integration
3. Mutual respect among role players
4. Continuity in participation
5. Consideration of multiple options
6. Flexibility
7. Transparency
8. Rights and roles
9. Accountability and commitment
10. Accessibility of information
11. Awareness creation
12. Capacity-building and empowerment
13. Efficiency
14. Suitability of scale and involvement
15. Feedback
16. Monitoring and evaluation

The guidelines require up-front preparation of a stakeholder analysis and a public consultation plan using a social profile method that included socio-economic, ethnic, cultural and geographical characteristics of the stakeholders; how they might be affected by or interested in the initiative; relationships and issues; and capacity of different stakeholders to participate

22. A review of the case studies revealed that a general commitment to stakeholder input was provided by a variety of frameworks, such as international conventions (Ribble River),¹⁹ country constitutions (Salto Caxias), national legislation (Tennessee Valley Authority, Olifants, Salto Caxias) and state or provincial legislation (Coquitlam). Legislative frameworks are often written to be flexible enough to address a range of situations, so detailed guidelines are frequently used to provide specific direction for stakeholder participation. Sometimes these guidelines are adopted as subordinate legislation;²⁰ in other cases they have been adopted as policy principles.²¹

24. International funding and development bodies have also played a significant role in influencing effective stakeholder consultation, with many having minimum requirements or guidelines.²² NGO

efforts have had considerable influence in adoption of improved practices in terms of stakeholder involvement. In addition, credit must be given to the increasing number of corporate bodies that have adopted a corporate development ethic, signed legal agreements, or have detailed guidelines referring to stakeholder participation.²³

25. These frameworks provide a solid basis for continuing with stakeholder participation in the face of opposition, and frequently play a role in ensuring provision is made for the funding of such processes.

3.2.2 Implementation

(a) Application of the stakeholder participation approaches

25. The fact that a vast number of projects needed to be reviewed in order to find useful examples to illustrate stakeholder participation, especially in developing countries, shows the limited extent of successful practical application of this approach in projects and, therefore, the need for improving stakeholder participation practices globally. The fact that there was only one case study that could be selected addressing the question of the need for a new dam (Olifants)

19 Aarhus Convention and European Union Water Framework Directive, IAP2 2006 – Ribble River case study, p. 52–53.

20 Water Resources WFD England and Wales Regulations, IAP2 2006 – Ribble River case study, p. 53–54.

21 The Bolton Principles as a result of evaluation, IAP2 2006 – Ribble River case study, p. 59.

22 In the case of World Bank's influence on Nam Theun 2 resettlement.

23 See IAP2 2006 for case studies.

suggests some possible matters worthy of consideration:

- As public acceptance of new dams is hard to achieve, decision makers often appear to prefer not to open for debate the option of building a dam, seeking instead to avoid conflict, though seldom succeeding;
- Well-planned professional participation processes with higher levels of engagement (on the public participation spectrum, Figure 3.1) combined with use of dispute resolution techniques and recognition of entitlements can offer an improved approach to new dam developments.

Box 3.5 Participation: Perceived barriers and positive responses²⁴

Politicians were elected to make decisions on behalf of the people.

Politicians were elected to make good decisions on behalf of their representatives. Without transparency, how can the public be sure the decisions are the best or made for the right reasons?

The government represents the public and politicians know what they want.

There is a wide diversity within “the public”. A good participation process ensures that politicians can be aware of the views and needs of the range of stakeholders. In fact, effective participation can reduce political risk.

Decisions are technical and the public is not qualified to comment.

The public is increasingly better educated and informed. In many cases, stakeholders who are not well educated can provide local information and insights or access expertise, which can contribute to improving the decisions.

Participation is time consuming. Decisions have to be made now.

A well-planned participation process can save time otherwise wasted in defending one’s stance or in dealing with conflict. Effective participation needs to represent only a small portion of time spent on infrastructure planning.

Public participation is costly.

A well-planned process can be cost effective. It is less costly to do cost-effective consultation than it is to have to deal with a hostile community reaction. There are many cost-effective ways to conduct participation, as seen in the case studies.

Participation is just a platform for dissidents and unrepresentative groups. It can be misused by single-issue groups, vocal minorities, Nimbys (“not in my back yard”) or self-interested parties.

A good participation process can facilitate dealing appropriately with the range of people who have interests. It can provide a structure for addressing issues. It can narrow down the issues in contention. It can open up options for addressing people’s concerns.

Participation can lead to paralysis and inaction.

A sincere and well-designed participation process will have a commitment and shared understanding of the promise and timetable.

The agency does not have the skills to do participation well.

A portion of development costs would be dedicated to capacity-building – training in participation, or in contracting relevant expertise.

Public participation means that politicians, advisers and technical experts might have to change their way of doing business. They might be concerned about public scrutiny of the decision-making process.

Public participation can provide a check on misuse of power. If decisions are made for the right reasons, if rights are respected and interests are taken into account, then the decision would withstand public scrutiny.

24 Adapted from Sarkissian and others 2003; IAP2 2006.

26. The report further indicates why participation is advantageous and identifies some common barriers to participation (IAP2 2006). Box 3.5 lists some of the commonly raised objections to participation, with corresponding positive responses. There is a need to build commitment, not just skills and practices in this field.

(b) Budgeting for stakeholder participation

27. In some of the cases examined, there was:

- No specific budget for stakeholder participation, with competition for resources out of the total project budget;
- No specific budget for stakeholder participation because an international donor had agreed to fund a project only once it was approved. As a result, an agency may need to allocate its existing overstretched resources to stakeholder participation during the environmental impact assessment and approval processes.

(c) Innovative mechanisms

28. Table 3.2 captures some key features that seem to contribute to relevant practices. These include appointment of designated consultation officers and setting up of ongoing committees or working groups, which facilitate the exchange of views and the building of relationships and trust, and the use of appropriate language and interpreters. Those tools that enable interaction and deliberation provide a greater opportunity for public input to decision-making, contributing to public acceptance of decisions that are arrived at through a participatory process.

(d) Stakeholder participation as a cross-cutting issue

29. A number of the case studies illustrate how participative processes have been or could be used to address a range of the other priority key issues in the dams and development debate:

- Compensation: resettlement at Nam Thuen 2, Upper Kotmale and Salto Caxias;

- Socio-economic impact assessment: Upper Kotmale and Andhikhola;
- Environmental impact assessment: Eastmain A1 and Thai Baan research;
- Benefit sharing: Jondachi and Eastmain A1.

30. In many cases, a stakeholder analysis can be broadened to provide a socio-economic baseline, which can be used to determine impacts and also to measure benefits on completion of the works. Early involvement of the communities in stakeholder analysis or issue identification can initiate or trigger the process of joint discovery of information for an environmental impact assessment, or exploration of entitlements, compensation and benefit-sharing options with affected people. This highlights the fact that participation processes are integral to improving a wide range of decisions about dams and development.

(e) Outcomes of stakeholder participation and evaluation

31. To truly understand and prove the effect (and benefits) of stakeholder participation it is necessary to undertake an objective independent evaluation of both process and outcome. In none of the case studies was public acceptance both directly and objectively measured. In two case studies, there was some formal assessment of stakeholder participation. In the Wivenhoe upgrading, the proponents assessed both process and acceptability of outcomes, but this was not an independent evaluation. In the Ribble River basin pilot case study, an objective process was used but focused on process rather than agreement with outcomes. In approximately eight case studies the outcomes appeared to be accepted and acceptable to the affected stakeholders and decision makers. This tentative assessment is based primarily on documented reports, positive rather than negative media responses and lack of appeals. It is, therefore, recommended that evaluation measures are identified early in the process and both process and outcomes of participation are documented, evaluated and made publicly available so that others can learn from the experience (Box 3.6).

Box 3.6 Evaluation of Ribble River basin planning

Ribble River basin planning was implemented as a pilot project to test European Union guidance on public participation and river basin planning processes with focus on water supply, flood risk management and recreation. The first three stages, comprising a sectoral and stakeholder analysis, communications plan, and development of a vision, were completed by mid-2004, taking 14 months. It was monitored under the European Union/European Commission-sponsored project Harmonising Collaborative Planning (HarmoniCOP) designed to improve public participation in river basin planning in European Union Member States. Criteria on which the process was to be evaluated were developed in conjunction with the Environmental Agency, which ran the planning process.

The HarmoniCOP project assessed and reported on how successful the process had been in ensuring actor participation. Stages 1–3 of the Ribble pilot were evaluated through participation observations, questionnaires at stakeholder events and key actor interviews (Davis and Rees 2004).

Responses from stakeholders demonstrated that the process to date had been worthwhile and that all the objectives of the process had been in part, or mostly, achieved. The process review found that stakeholders had a clearer understanding of the issues; stakeholder expectations were managed; and relationships between organizations helped understanding of wider issues and other points of view within the basin. On the other hand, some sections of the community were underrepresented; and the process was limited by the financial constraints of the environmental impact assessment. Mechanisms that fostered social learning were also identified.²⁵

3.3 Conclusions and recommendations

32. From the literature reviewed and the case studies selected, it is clear that there are some excellent regulatory frameworks on which to ground stakeholder participation and there is a wide range of cost-effective techniques for engaging the community to improve decisions. It is also clear that these techniques are not being widely or consistently applied, either globally or within all stages of dam projects. A challenge is to increase commitment to the adoption of at least basic legislation and guidelines, and resourcing of stakeholder participation through enhancing the understanding of its benefits. Documentation and objective evaluation of participation in a manner acceptable to all parties, including decision makers and stakeholders, will assist in promoting better understanding and continual improvement. This needs to be accompanied by capacity-building in skills and techniques to achieve effective stakeholder participation.

3.4 Case studies

33. Over 30 dams and related developments were screened to find 13 good examples of relevant stakeholder participation practice. Besides meeting other required criteria, projects were selected that:

- Illustrated a range of processes and techniques with wider global

applicability, given different institutional contexts, culture, access to technology, literacy rate and resources;

- Had sufficient documented information about the stakeholder participation process accessible within the time frame and resources of the consultancy;
- Reflected at least some of the IAP2 core values (box 3.1) and DDP first and second level issues identified in the draft checklist (See Annex I).

34. Information was sourced from extensive web and literature searches and results from participant manager and stakeholder questionnaires, which had been sent to identified participant managers (IAP2 2006, Appendices 3 and 4). Much of the literature available about dam projects involved those that had been controversial, rather than good examples of stakeholder participation. In a couple of cases, the information received was general project information rather than participation related. Some participant managers reviewed the case study outlines and added information. Only one stakeholder questionnaire was received although great effort was expended to seek additional perspectives via web sources.²⁶ Some

²⁵ IAP2 2006, Ribble River case study, p. 60–61.

²⁶ Section 13 of each case study (Appendix 1) identified other perspectives.

cases were included despite information gaps because they illustrated a range of international experience, which may be applicable to other situations.

35. Extensive review of the literature resulted in a number of examples being discarded due to either lack of sufficient information or poor consultation practices. A case study in the early drafts of the report, for instance, was replaced with another due to civil society feedback and explanation about the inadequacies in participation, which were not apparent from other sources (IAP2 2006).

36. In the analysis of case studies, the application of stakeholder participation practices was reviewed in relation to:

- First-level stakeholder participation issues identified during DDP: stakeholder identification; access to information; informed participation in decision-making; and ways to measure public acceptance;
- IAP2 core values and principles, and experience of participation professionals.²⁷

37. Annex II summarizes the key aspects of the 13 case studies. A detailed discussion of these case studies is given in the report on stakeholder participation (IAP2 2006). Although the degree of success of stakeholder participation throughout a project varies widely across the case

studies, together they provide a sample of relevant practices under a range of country frameworks and stages of dam development.

38. The consultant's report (IAP2 2006) contains an extensive set of references, including Internet links, to the sources of information identified during the study of the issue. The report, which is open to review by the public, can be accessed in the DDP website at www.unep.org/dams/.



²⁷ Identified in characterization.

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Dealing with social aspects

Summary

This chapter deals with the assessment of social impacts, which has become a distinctive and very important aspect of the dam planning process.²⁸ Similarly, the elaboration and implementation of social mitigation and development measures is now a conspicuous component of environmental and social management frameworks for project implementation. The importance attributed to social assessment is relatively new and results from concerns and lessons learnt from unsuccessful past experiences, as highlighted by the World Commission of Dams knowledge base. Outstanding social issues are the legacy of such negative experiences, which remain unresolved for a number of existing dams in all regions of the world. Dealing with such legacy is imperative if new undertakings are expected to gain the acceptance of the public, and if the confidence of civil society is to be built in the capacity of managers and practitioners to deal properly with social issues.

Taking notice of the close linkages between the issues, it was considered convenient to address them together when dealing with the social aspects of dam planning and management. In effect, outstanding social issues in existing dams are usually a result of failures in the planning and implementation of social mitigation measures. On the other hand experience emanating from addressing outstanding social issues will provide valuable input for improving the assessment and management of social impacts.

The approach and methodology for social impact assessment varies depending on the purpose and application for which the assessment is being undertaken. A generalized process involves a series of key elements ranging from the characterization of the social environment through estimating the severity of effects, and the formulation of management actions that will allow for the active management of the social change, and monitoring and assessment of outcomes. In recent times social impact assessment has become a relatively well-defined field, enabling analysis and assessment of information for the purpose of defining actions either to remedy negative impacts or to enhance benefits. Furthermore, it is apparent from the review done that, in some instances, social impact assessment is being undertaken to acceptable standards and levels of detail to enable the formulation of appropriate management plans (to mitigate negative impacts and to optimize benefits). Therefore, within the literature, there exists a reasonable body of experience upon which readers can draw.

However, a key gap emerging from the review carried out is that there are a very limited number of normative frameworks that deal exclusively and specifically with social impact assessment and, in a majority of cases, the assessment is implicitly captured within many international frameworks and embedded in national normative frameworks governing other overarching issues, from constitutional law to specific laws dealing with environmental impact assessments. Thus, from the review of the literature done and the case studies selected,

²⁸ During the prioritization stage of the key issues to be dealt with by the Compendium (See Annex I), the issues of social impact assessment and addressing outstanding social issues were considered as distinct elements of the : recognizing entitlements and sharing benefits and addressing existing dams. On this basis, DDP commissioned separate expert reviews of literature and examples of practices concerning these issues. The contents of this chapter draw heavily on the information contained in the respective final reports (Heinsohn 2006; Schmidt-Soltau 2006).

the need appears to be to put in place normative frameworks specifically dealing with social impact assessment, providing appropriate linkages to existing normative frameworks covering the implementation of the management of social change. The social impact assessment process should therefore be formally defined to allow for compliance. Evaluation criteria to assist in assessing whether or not a particular assessment meets the requirements of the proposed normative framework and the proposed assessment process should consequently be developed.

Generally speaking, “outstanding social issues” are unsolved social situations resulting from failures in the planning and implementation of the mitigation measures addressed in the respective environmental and social management frameworks (for example environmental impact assessments, resettlement action plans, plans for indigenous peoples and community development plans). Often, they only became visible after project implementation (second-generation impacts). Claims related to outstanding social issues are usually raised by the affected communities, with or without providing evidence. The review of the literature carried out indicates that though much has been written on the nature of outstanding social issues, little has been published on how these issues have been addressed and hardly anything on the outcomes of the remedial processes. The main factors triggering the addressing of outstanding social issues are usually the desire to increase public acceptance of new projects, and the need to comply with the right to remedy as articulated by the Universal Declaration of Human Rights and the International Covenant on Civil and Political Rights. Compensation (cash or enhanced livelihoods) through remedy funds, grievance mechanisms, restitution and legal process appear to be the main approaches to address outstanding social issues. To improve the effectiveness and efficiency of a an efficient long-term monitoring and evaluation system, which identifies outstanding social issues, should be put in place, in the context of a comprehensive approach to address such social issues. Additional research is needed to increase the knowledge base and to assess the potential of existing and new mechanisms to address outstanding social issues.

4.1 Social impact assessment

4.1.1 Introduction

1. Social impact assessment is increasingly recognized as a fundamental tool to identify positive and negative impacts and effects on stakeholders and, in particular, affected people. It also provides the basis for appropriate mitigation and development measures and provides substantive inputs to the elaboration of resettlement plans. Adversely affected people should be recognized as first among the beneficiaries of the project and consequently the recognition of rights and assessment of risks has been proposed as a basis for identification and inclusion of stakeholders in mitigation, resettlement and development-related decision-making (WCD 2000).
2. Social impact assessment enables analysis and assessment of information for the purpose of defining actions either to remedy negative impacts or to enhance benefits. However, a key gap emerging from this review is that there are hardly any normative frameworks that directly govern social impact assessment. In a majority of cases, such assessment is implicitly embedded in normative frameworks governing environmental impact assessment.

4.1.2 Characterization of the issue

3. Social impact assessment is a process of research, planning and the management of social change or consequences (positive and negative, intended and unintended) arising from policies, plans, programmes and projects (Taylor, Bryan and Goodrich 1995). It is one of many tools in the toolbox of integrated environmental management that focus on the human element of development interventions (DEAT 1998). However, the human element cannot be examined and assessed in isolation from the biophysical and economic dimensions that, together with the social dimension, contribute to attaining sustainability.²⁹
4. Over the past few decades, social impact assessment has become reasonably well defined as a process of incremental information gathering, involving multiple, interrelated disciplines, to enable analysis and assessment for the purpose of defining actions, either to remedy negative impacts or to enhance benefits (Taylor, Bryan and Goodrich 1995).
5. Social impact assessment needs to be applied at all stages of the project life cycle

²⁹ <http://habitat.igc.org/agenda21>.

(generally at differing levels of detail for different decision-making purposes at different stages in the life cycle).

6. The approach and methodology for social impact assessment varies depending on the purpose and application for which the assessment is being undertaken. However, a generalized process involves the following (Taylor, Bryan and Goodrich 1995):
 - Characterization of the social environment, and the definition of boundaries;
 - Understanding of the intervention (whether policy, plan, programme or project) to enable the projection of effects;
 - Estimating the severity of effects, and the formulation of management actions, either to remedy negative aspects or to enhance benefits;
 - Active management of social change (with review and feedback loops to enable remedial actions if the need arises);
 - Ongoing monitoring (post-construction, that is, during operation) to determine whether or not the desired outcomes have been achieved;
 - Evaluation (at an agreed point in the project life cycle) to inform future initiatives.
7. Furthermore, specific elements that characterize social impact assessment and that lead to tasks that need to be carried out (in varying degrees of intensity) are the following (Taylor, Bryan and Goodrich 1995; Vanclay 2003):
 - Public involvement and participation;
 - Identification and consideration of alternatives;
 - Profiling of baseline conditions;
 - Scoping;
 - Projection of estimated effects;
 - Prediction and evaluation of responses to impacts;
 - Mitigation of negative impacts and the optimization of benefits;
 - Assessment of indirect and cumulative impacts;
 - Monitoring, auditing and evaluation.

4.1.3 Social impact assessment:

Current status in frameworks and in implementation

8. The review of literature and examples of implementation identified during the elaboration of the background information provide the basis for the following discussion. Table 4.1 lists the case studies selected to illustrate the implementation of the issue and its main elements.

(a) Frameworks

9. The review carried out indicates that there are a limited number of normative frameworks that deal exclusively and specifically with social impact assessment, though it is implicitly captured within many international frameworks. Furthermore, social impact assessment is often guided by country-specific policies and legislation of national governments (national policy or policies housed within different line function departments) and of provincial, state, district and local governments (as overarching policy or individual policies housed within different departments) dealing with environmental impact assessment. In addition, following the United Nations Conference on Environment and Development (the Earth Summit) in Rio de Janeiro, 1992, elements of social impact assessment are also covered by international corporations (for example mining, industry and power generation) for application in their activities. Similarly, NGOs, aid agencies, parastatals, national government funding agencies and professional associations also apply normative frameworks to their activities, including those that cover social impact assessment or elements of it.

(b) Central messages of normative frameworks

10. Some of the central messages³⁰ relevant to social impact assessment within normative

³⁰ Note that this does not provide a summary or treatise of central messages; rather, important ones are lifted out for purposes of illustrating how social impact assessment links to the normative frameworks.

frameworks are as follows:

- It is important to consider the social and socio-economic environments (that is, those dealing with people) when conceptualizing, planning, implementing, operating and maintaining and decommissioning projects;
- A detailed understanding of the receiving social and socio-economic environments should be obtained early in the project life cycle;
- Baseline social and socio-economic conditions should be surveyed, established and understood prior to project intervention. This is important to understand the social and socio-economic environments and also to serve as a yardstick against which the effects of a project and mitigation actions can be measured;
- Alternatives need to be identified and considered to the same level of detail for each. Wherever possible, impact avoidance and impact minimization are preferred alternatives;
- Indirect, downstream and cumulative impacts should be identified and assessed for each alternative;
- The involvement and participation of potentially affected communities is important in understanding and quantifying the potential effects of a project and the planning and implementing of mitigation measures, such as resettlement;
- Considering that resettlement (including economic displacement) is probably the single most important negative impact on the social environment, resettlement programmes should address not only the directly affected resettlers but also the population in host areas and potential effects on these people. Furthermore, resettlement programmes should be undertaken within a development paradigm to promote the attainment of sustainable livelihoods for those affected by resettlement (resettlers and hosts);
- After the completion of a project (usually construction completed),

affected people's social and socio-economic circumstances should be at least the same, but preferably improved, when compared to their baseline conditions;

- As with the management of negative impacts, for example resettlement, the optimization of benefits for the wider community within which a project is undertaken should also be conceptualized, planned and implemented as sustainable development projects;
- Monitoring and post-project evaluation should be undertaken on a predefined basis.

4.1.4 Implementation

(a) Public involvement and participation

11. Public involvement and participation is defined as any process that involves the public in problem solving or decision-making and that uses public input to make better decisions (see also Chapter 3).³¹
12. Therefore, it is necessary to identify stakeholders (either directly affected or with a wider interest in the development proposal) as early as possible within the project life cycle, recognizing that stakeholder identification should be an ongoing process for the duration of a project (as a project configuration changes, new stakeholders may emerge). Following stakeholder identification, it is necessary to develop a communications strategy that is customized to different stakeholder groups, for example by sector, in order that meaningful information exchange can be facilitated. Taking note of customized communications strategies, it is critical that there is consistency in the central messages contained within these strategies. Through active involvement with the public in a meaningful way, environmental (biophysical), social (cultural, political, socio-economic) and economic issues relevant to a development proposal may be identified, and can feed into the assessment regime (Box 4.1).

³¹ International Association for Public Participation (IAP2); See <http://www.iap2.org/associations/4748/files/foundations-bro-pdf>.

Box 4.1 Odra River Basin Flood Protection project, Poland

The Odra River Basin Flood Protection project in Poland serves as a useful example of relevant practice in public involvement and participation. The measures proposed for flood protection downstream the Odra river involved the development of a dam with a total reservoir area of 26.3 square kilometres. The proposed project was opposed by a number of affected communities. To address community concerns, the development proponent, the Polish Regional Water Board, undertook extensive and intensive consultation over a number of years. Although the outcomes were not agreed by all parties (and this should not be the aim or expected result of public involvement and participation), the consultation that did occur is an indication of how public participation can be conducted, and how it can contribute to improved decision-making (RWB Gliwice 2005).

13. Nevertheless, it must be noted that, while there are linkages between public involvement and participation and social impact assessment, and while they provide mutual support, each process has a distinctly different purpose and subsequent set of outcomes.

(b) Identification and consideration of alternatives

14. A social impact assessment should commence as early as possible within the project life cycle and should be used to assist with the identification and consideration of alternatives, as described in Chapter 2. All practical alternatives, including the no-change alternative and non-infrastructure alternatives, need to be identified and examined to the same level of detail, with social effects carrying the same weight in decision-making as inputs from other disciplines. Where applicable, alternatives that minimize or avoid impacts should be given special attention. Furthermore, it is critical to examine alternatives and their impacts and benefits (negative and positive) in relation to other projects (existing and planned for the future) in order to identify and deal with potential downstream and cumulative impacts.

15. Examples exist where social aspects have positively influenced the consideration of alternatives, with alternatives having obvious negative social impacts being discarded early on in the project life cycle. This usually occurs during screening, an early project planning activity that has, as

its objective, the identification of (social) environmental fatal flaws and red flags.³² In this regard, an alternative with a fatal flaw should not be considered further (Box 4.2).

(c) Profiling of baseline conditions

16. Profiling is a fundamental element of the social impact assessment process. It aims to document the relevant human environment within the area of influence of a development proposal. It is against this existing base of social conditions and trends that the effects of change need to be understood, assessed and measured (Taylor, Bryan and Goodrich 1995).

17. In general, profiles provide the following kinds of information: descriptions of the social environment (political context, institutional structure, arrangements and capacity, demographics, socio-economics, land uses, current conditions and social trends); local and regional economics; descriptions and analyses of existing social and cultural values; and a framework and plan for the assessment of social effects, including social factors to be used as measurable indicators during subsequent monitoring, evaluation and auditing (Taylor, Bryan and Goodrich 1995). Baseline surveys should be conducted at the lowest necessary level, including household or even individual.

³² A fatal flaw is defined as a significant long-term negative consequence on the affected social environment that is extremely difficult to mitigate or undesirable to promote. A red flag is defined as a potentially serious impact that could have medium- to long-term negative consequences on the affected social or biophysical environments that can only be mitigated at significant will, effort and cost (by this is meant the total cost and not only financial and economic considerations).

Table 4.1 Main elements of social impact assessment addressed by the selected case studies³³

Dam/Project	Public involvement	Alternatives	Profile of baseline	Scoping	Projection of effects	Prediction and evaluation of response to impacts	Mitigation	Indirect and cumulative impacts	Monitoring
Alborz									
Brilliant									Socio-economic monitor (independent), focus on local benefits
Bumbuna			Extensive over many years (despite civil war)						
Burnett									
Campos Novos									
Drekoopies				Loss of resources, homes and economic displacement, and community infrastructure and services					
Kandadji					Resettlement, loss of productive resources and loss of infrastructure				
Odra	Extensive and intensive (outcomes not agreed by all)								
Olifants		Dam and non-dam (implement concurrently)							
Saito Caxias									
Son La									
Tuyen Quang								Tourism and fisheries opportunities	
Thukela						Significant quantification of impacts associated with dams and appurtenant works			
Upper Seti							Resettlement, acquisition, influx, enhancement		
Xiaolangdi									

³³ This table illustrates the main elements of social impact assessment addressed by the selected examples. The main elements considered reflect those identified in the characterization of the issue. For more detail, see the case studies in the final report of the issue (Heinsohn 2006). The blue boxes indicate that the topic is addressed and the green boxes indicate that the consultant considers the example to be a particularly informative application.

Box 4.2 Olifants River Water Resources Development project (Phase 2), South Africa

The screening phase for the Olifants River Water Resources Development project (Phase 2) in South Africa serves as a useful example of relevant practice in identifying and assessing alternatives. The proposed development was to meet water supply needs for mining and domestic uses. For this proposed development, alternatives comprised both dam and non-dam alternatives. For dam alternatives, potential social impacts were examined in detail and contributed to the selection of a preferred dam alternative (that avoided potentially serious social impacts). For non-dam alternatives, aspects such as water conservation, water demand management, groundwater options and the trading of water allocations were investigated. From a social perspective, water trading was examined in detail because of potential negative effects on small-scale irrigators as well as potential negative social effects on agricultural employment associated with larger, commercial irrigators. In both cases, potential social effects related to loss of employment, loss of income, decreased food security and the possibility of contributing to increased poverty. The examination of dam and non-dam alternatives contributed to a proposed project that is not focused only on a large storage dam but which also addresses non-dam options that can contribute to greater water resource stability and availability in a water management area where water demand exceeds the available water that has been allocated to competing sectors (including the natural environment, for which ecological water requirements must be met) (DWAF 2004a, 2004b, 2004c).

18. While several sources of data can be utilized, the collection of baseline data is time consuming and can be costly. Therefore, sufficient resources need to be committed to enable the task to be completed to achieve the desired outcomes, recognizing that the baseline is the basis against which project effects will eventually be measured, as part of monitoring, evaluation and auditing (Casley and Kumar 1987) (Box 4.3).

(d) Scoping

19. Scoping is an analytical process that is designed to describe the boundaries of a particular project and then focus the assessment on key issues (Taylor, Bryan and Goodrich 1995). It can take various forms, for example technical, authority, specialist and public scoping. To achieve its objectives scoping must be both comprehensive and flexible. It is particularly important that scoping identifies sensitive aspects

of the receiving environment (negative and positive) to enable the formulation of appropriate management plans to mitigate negative impacts and to optimize benefits.

20. In addition, scoping should identify main policies, plans, programmes, and projects and operations that may affect the social and socio-economic environments within the boundaries chosen. It should also identify the appropriate information and data that are available or may have to be obtained in order to effectively analyse and deal with potential effects (Taylor, Bryan and Goodrich 1995).

21. Furthermore, a range of data can be collected during scoping, covering multiple, yet integrated, social elements, including lifestyle and traditions, cultural aspects, archaeological aspects, and community, institutional and infrastructural impacts (Vanclay 2003).

Box 4.3 Bumbuna hydroelectric project, Sierra Leone

The Bumbuna hydroelectric project on the Seli River in Sierra Leone serves as a useful example of the profiling of baseline conditions. This project was first proposed in the 1970s and construction occurred between 1982 and 1997. The project involved the construction of the Bumbuna Dam, with a surface area of 21 square kilometres and a maximum operating capacity of 350 million cubic metres. For most of the time, the country was plagued by civil war. Despite this, extensive baseline data were collected over a protracted period of time, even following the construction of the dam, when a post facto environmental impact assessment was undertaken. Methods used to gather data included questionnaire surveys with heads of households, focus group discussions with young people, women, men, elders and chiefs, and consultative meetings with the community. The baseline information that was gathered was comprehensive, with text, data and illustrations being provided on general socio-economic conditions, demographics, settlements and infrastructure, ethnic groups, household structure, village size, water supply, solid waste disposal, public health, attitude to resettlement, culture, history and archaeology, social organization and traditions, religion, sacred sites, secret societies, tourism and recreation. Household surveys were conducted in the 54 villages in the reservoir area and data were collected from a total of 872 households. Importantly, the baseline data served to inform planning and decision-making for the management of social change arising from the dam, and, into the future, can serve as the yardstick against which monitoring, evaluation and auditing can be undertaken (Nippon Koei UK 2005).

22. Similarly, a range of methodologies can be adopted for scoping, utilizing primary and secondary information and data, including discussions, workshops or interviews with potentially affected people or entities (closely linked to public involvement and participation); the collection and review of literature, plans, maps and other relevant material; and questionnaires and surveys. Gaps in information can be bridged using information collected as part of profiling.
23. It is important to note, however, that the extent and intensity of scoping must be consistent with the type, size, extent and reach of a proposed project and, therefore, it is logical that not every project will require the entire range of disciplines. There is also a close link between scoping and public involvement and participation (Box 4.4).

(e) Projection of estimated effects

24. Scoping, profiling and public involvement and participation provide a sound basis (baseline) from which to project the potential social effects of a proposed project, for all feasible or realistic project alternatives, including the no-change alternative. This is usually undertaken in a matrix, assessing the scale, intensity, duration and probability of occurrence of both negative impacts and benefits, leading to an assessment of the significance of a potential impact or benefit for a particular project alternative (DEAT 1998). It is important that a risk assessment

is not undertaken in isolation for each project alternative. Rather, the assessment must take into consideration all baseline conditions, including unrelated but potentially synergistic, ancillary or downstream development proposals, in order to account for potential cumulative impacts or benefits (Taylor, Bryan and Goodrich 1995).

25. In undertaking this exercise, it should be recognized that accurate projections are difficult to make, and use should therefore be made of projection techniques (some of which are economically based), for example the analysis of trends, the use of population multipliers, computer modelling and consulting experts, drawing comparisons between communities, input-output modelling, cost-benefit analyses, quantifying externalities, econometric modelling, the use of social accounting matrices and the formulation of scenarios. However, it may also be noted that complex techniques are not an end in themselves and emphasis should rather be placed on experience, logic and common sense (Taylor, Bryan and Goodrich 1995) (Box 4.5).

(f) Prediction and evaluation of responses to impacts

26. There are a number of methods that can be used for the purpose of impact prediction and evaluation, including analogues, expert opinion, literature reviews and cause-effect relationships. When selecting methods, consideration should be given

Box 4.4 Driekoppies Dam, South Africa

The Driekoppies Dam on the Mlumati River in South Africa serves as a useful example of scoping. The Driekoppies Dam, which has a catchment area of 900 square kilometres and a storage volume of 251 million cubic metres was developed mainly for the purpose of providing water for irrigation. This project commenced in the mid-1990s, with extensive scoping being undertaken of communities affected by the proposed dam. Scoping was undertaken within a well-defined policy framework and identified a range of issues, including the loss of productive resources and consequent effects on economic activities, effects on settlements and housing (including resettlement), effects on community facilities and services (in particular related to improved services), community organizations and institutional relationships, historical and archaeological sites, population pressure and social dislocation. It would appear that scoping was comprehensive and enabled the assessment of the significance of potential impacts. Each impact was classified as positive or negative, and rated in terms of magnitude, significance, probability and duration. The significant impacts were identified as loss of productive resources (negative), social dislocation (negative), improved domestic water supply (positive) and subregional development potential (positive). The outcomes of scoping, as contextualized within the profile of baseline conditions, informed future project activities concerning the management of social change, notably the formulation and implementation of a resettlement action plan within a development paradigm (HSRC 1991, 1993a, 1993b).

Box 4.5 Kandadji Dam project, Niger

The Kandadji Dam project on the Niger river in Niger, with an estimated storage capacity of 1,597 million cubic metres, is being developed mainly for the purpose of supplying water for irrigation. The planning stage of the project provides a useful example of the projection and estimation of widely encompassing social effects. They cover both negative impacts and benefits, including resettlement (35,000 people from 15 villages), loss of infrastructure (a national road, boreholes, clinics, schools, mosques, slaughterhouses, markets and grain mills), loss of agricultural land (approximately 7,000 hectares), a guaranteed water supply (for urban and rural domestic water, irrigation, livestock and aquaculture), a reduction in dependence on energy imports, food security and opportunities for sustainable development, impacts on public health, and indirect impacts (reduced rural migration, upstream and downstream industrial opportunities, employment opportunities during dam construction and a contribution towards the attenuation of desertification). For the Kandadji Dam project, these potential effects were projected at an early stage in project planning, enabling issues and potential impacts to be addressed in subsequent planning phases. It is also pertinent to note that the projection of potential effects did not only focus on negative aspects, but also included the estimation of benefits, thereby informing planning to enable the realization of benefits over time (Haut Commissariat au Barrage de Kandadji 1999; Kimba 2003, p. 46–54).

to criteria such as the appropriateness of the method for the proposed development, its acceptability to relevant interested and affected parties, whether it is professionally acceptable, its relative ease of application, management limitations, its applicability to the range of key issues and the provision of results that enables professional judgement to be made in evaluating the impacts (Taylor, Bryan and Goodrich 1995) (Box 4.6).

(g) Mitigation of negative impacts and optimization of benefits

27. A key aspect of social impact assessment concerns the mitigation of negative impacts and the optimization of benefits. Mitigation is the avoidance or minimization of negative impacts associated with a project, in a manner that is sustainable. In short, mitigation involves implementing the outcomes of a social impact assessment, which can be achieved through the formulation and implementation of social management plans that, critically, must also address the optimization of benefits.
28. In general, there are two categories of social management plans; those that deal with negative impacts and those that deal with benefits. In each case, however, the overriding consideration should be the sustainable development of people affected by a project. In this regard, social management plans should be formulated within a development paradigm, and should move beyond “leaving project affected people at least as well-off as before the project intervention” (IFC 2002).
29. Similarly, many examples exist of potential impacts that may arise from a proposed project. Many of these impacts can usually be managed via a technical solution, for example the realignment of a road, suppressing dust on a construction site and limiting noise. However, there is one single impact that is significantly more difficult to manage and for which technical solutions do not exist, namely displacement (including aspects such as

Box 4.6 Thukela water project, South Africa

The Thukela water project (feasibility study) on the Thukela river in South Africa serves as a useful example of the prediction and evaluation of responses to impacts. The water project is primarily an inter-basin transfer scheme comprising two dams, namely, the Jana and the Mielietuin. For this proposed project, the social impact assessment identified and discussed potential social issues and effects at two levels. First, it examined a number of contextual issues relevant to the proposed project that had come to the fore during the course of the investigation. Of these, the most critical were the potential impact of HIV/AIDS, population trends in potentially erodible areas, the potential impact of sedimentation, land reform and land restitution, impacts on the downstream environment, and impacts on the receiving environment. Thereafter, the study focused on the potential effects of each of the major project components, namely the Jana Dam, Mielietuin Dam, and the conveyance routes (canals and steel pipelines). The assessment was carried out in detail, with the outputs seamlessly interfacing with the formulation of future social management plans (to deal with macro issues, negative social impacts, and the optimization of project benefits on a local and regional scale) (DWAF 1999).

economic relocation), and the related issue of loss of access (to areas of interest, sacred or religious sites or natural resources).

Where displacement is agreed upon, careful attention needs to be paid to the formulation of a resettlement action plan with the intimate involvement of affected people (and with all resettlement activities being closely aligned to those of the primary development project) (IFC 2002).

30. However, great care is required in the formulation of resettlement action plans. Also, importantly, resettlement plans and their implementation will ideally receive the same priority (in planning and resources) as the primary development intervention, and be agreed upon and formulated prior to the commencement of construction. Implementation should occur before or concurrently with construction (IFC 2002).
31. Furthermore, in terms of planning to optimize benefits, in many cases, the area of influence of a project is wider than the people directly affected by, for example, resettlement. In all cases, formulation and alignment of social development plans with government strategies will help ensure the optimization of benefits (from the primary as well as downstream developments) in a sustainable manner, and that individual projects receive the necessary government support into the future (for example in the staffing of schools or the provisioning of clinics). Similarly, the greater the commitment and involvement of the development proponent, the more likely that social interventions will be successful and sustainable (Box 4.7).

(h) Assessment of indirect and cumulative impacts

32. As regards indirect and cumulative impacts, their assessment essentially follows a cause-effect model that establishes the way in which “resources of value” are affected by multiple impact sources (Vanclay 2003). It employs a systems approach when defining cumulative effects and impact relationships.

33. Ideally, this kind of impact assessment should be undertaken within a broader strategic framework (at national, state/provincial, district or local level). Mitigation measures must be proposed for the negative cumulative effects and recommendations made for the enhancement of the resources of value. In essence, the same elements that characterize social impact assessment characterize the assessment of indirect and cumulative effects, namely public involvement and participation, profiling, scoping, projection of estimated effects, and monitoring, evaluation and auditing, for all alternatives under consideration.

(i) Monitoring, evaluation and auditing

34. In terms of compliance, monitoring serves to identify discrepancies between the expected and actual effects of a proposal, thereby facilitating adjustments that may be necessary to the management of the change or the change being implemented itself, to help reduce unanticipated and unwanted effects or to enhance benefits. Hence, monitoring is most informative to a project if it is initiated early and continued

Box 4.7 Upper Seti Storage Hydroelectric project, Nepal

The planning stage of the Upper Seti Storage Hydroelectric project on the Seti River in Nepal provides a useful example of addressing the mitigation of negative impacts and the optimization of benefits. Mitigation measures include resettlement and acquisition principles (two methods of compensation: land for land and cash, the valuation of individual households and their effects before determining compensation packages, the development of an acquisition, compensation and rehabilitation plan, the formation of a compensation committee, the provision of compensation before land is acquired, and resettlement options based on people's preferences), a code of conduct applicable to outside construction workers (to minimize impacts on the cultural practices of local communities), the protection of ancient archaeological sites, and the provision of additional social infrastructure and services to accommodate the influx of 500–1,000 workers into the project area. In addition, several enhancement measures, which aimed to enhance positive impacts of the proposed project or to compensate for negative impacts, were also suggested, including improvement in agricultural practices, training, skills development, loan assistance programmes for small businesses (such as cage fish culture, livestock and poultry rearing and retail shops), environmental awareness for conservation, and other community development initiatives (such as rural electrification, education, health, sanitation and water supply). The aforementioned are illustrative of the level and detail of planning that are required to mitigate negative social effects and to optimize benefits that may accrue from a project of this nature (Nepal Electricity Authority 2004).

- for the duration of the project, and beyond the completion of physical implementation. It is noted that often, the description and management of social change, and the assessment of its significance, are major methodological problems in monitoring, and that it is difficult to differentiate among the various origins of specific social changes. Thus, monitoring requires that some criteria be established to focus the effort around key variables and to concentrate on key issues (Taylor, Bryan and Goodrich 1995).
35. Monitoring is also an important component of project evaluation. However, in this context, evaluation is combined, at some point towards the conclusion of a project process, with a view to informing other projects (rather than the project at hand that is being evaluated). Therefore, evaluation is viewed as the final part of the social impact assessment process, but is not necessarily only undertaken at the conclusion of a project. Furthermore, it is seen to be separate from monitoring and the management of social impacts, although it is complementary Taylor, Bryan and Goodrich 1995).
36. Evaluation is defined as a periodic assessment of the relevance, performance, efficiency and impact of the project in the context of its stated objectives (Casley and Kumar 1987). In order to achieve this, it is necessary to make use of monitoring data, but additional data collection may also be required, and can involve comparisons with other projects of a similar nature (Taylor, Bryan and Goodrich 1995).
37. In addition to monitoring social change as a result of a development (both direct and indirect), it can prove useful to undertake external, independent audits of social impact assessment processes and outcomes. Apart from providing a completely external perspective, an audit also demonstrates to all role players that project activities are totally transparent and open to scrutiny.
38. It should also be considered that the social impact assessment process itself needs to be monitored and evaluated in order to inform future work and also to advance assessment concepts and methods for new projects (Taylor, Bryan and Goodrich 1995) (Box 4.8).

4.1.5 Conclusions and recommendations

39. The following conclusions can be drawn from this study of the social impact assessment aspect of project planning:
40. Arising from the characterization of the current status of social impact assessment, it is evident that there are few normative frameworks covering the subject. Indeed, it would appear that, for the most part, social impact assessment is embedded within normative frameworks governing other elements of law, from overarching constitutional law to specific laws governing environmental impact assessments. Of importance is that there appears to be a gap in normative frameworks, with those of a social orientation focusing on the management of social impacts without due consideration

Box 4.8 Brilliant Expansion project, Canada

The Brilliant Expansion project on the Kootenay River in Canada serves as a useful example of monitoring. The dam covering a surface area of 445 hectares and with a storage volume of 48.5 million cubic metres is primarily for hydropower generation. In order to monitor and report on the social and economic impacts and benefits associated with the expansion of the generating capacity at the Brilliant Dam, and to identify deviations from outcomes anticipated, the Columbia Power Corporation hired an independent, third-party contractor to serve as the socio-economic monitor for the project. The socio-economic monitor objectively monitored and reported on the impacts and benefits that occurred as a result of the expansion project. Through investigating a range of social and socio-economic variables, the monitor could gauge the impact of the expansion project on the local communities and the region (that is, within a 100-kilometre radius of the project site). The monitor used various indicators to measure the benefits and impacts of the project. Aspects investigated in terms of employment and expenditure included the number of local hires, trades, female workers, First Nation workers, by nation and by band, and disabled workers, the number of apprenticeships, the ratio of project employment to the regional labour force, the direct and induced expenditures by communities, and the number of local firms that benefited from the project (Brilliant Expansion Power Corporation 2000).

and specification of the identification and assessment of impacts. Therefore, it can be argued that unless normative frameworks that specifically address social impact assessment and its requirements, the practice of such assessment will fall short of that considered adequate and necessary by society (interested in or affected by a development proposal).

40. Notwithstanding the need for a normative framework that specifically governs social impact assessment, it does need to be acknowledged that, increasingly, such assessment is being practised globally for dam and other projects. Furthermore, it is apparent from the review done that, for the most part, this assessment element is generally being undertaken to acceptable standards and levels of detail to enable the formulation of appropriate management plans (to mitigate negative impacts and to optimize benefits). Therefore, within the literature, there exists a reasonable body of experience upon which readers can draw. Importantly, persons interested or involved in dams and development should not confine their literature reviews to dam projects only – there is considerable experience from developments in other sectors that is of application to future dam projects.

41. Given these considerations, the following conclusions can be drawn from this study of the social impact assessment aspect of project planning:

- At the commencement of a project, adopt the widest possible set of normative and planning frameworks, so as to enable the widest possible examination of the proposed project and its alternatives, within the widest possible consideration of the receiving environment. Over time, as project planning progresses, the frameworks can be narrowed down;
- Considering the long lead time required for the planning of projects, such as large dams, there is merit in adopting an incremental approach to social impact assessment, with the level of detail of information increasing as

planning progresses;

- Similarly, it is desirable to streamline institutional arrangements for the lifespan of planning and implementation, to facilitate continuity over a long period of time;
- The investigation and assessment of alternatives should be undertaken to comparable levels of detail, to enable informed decision-making between alternatives;
- Given that social impact assessment is about people, it is critical that people are involved in the planning of their own futures, sooner rather than later in the project life cycle. There is merit in communication (open, transparent and ongoing) commencing as early as possible within the project life cycle;
- The single largest social and socio-economic impact of large projects, such as dams, is involuntary resettlement (physical or economic displacement). The implementation of resettlement action plans takes time and requires considerable resources.

42. Arising from the aforementioned conclusions are the following recommendations:

- Formulate a normative framework covering social impact assessment, and provide linkages to existing normative frameworks covering the implementation of the management of social change, for example those covering involuntary displacement;
- Formally define the process of social impact assessment that must be adopted to achieve compliance with the proposed normative framework;
- Develop evaluation criteria to assist in assessing whether or not a particular social impact assessment meets the requirements of the proposed normative framework and the proposed assessment process;
- Review the normative framework and assessment process after five years and effect refinements as necessary.
- Given that there are experiences available elsewhere, there is then merit and benefit in sharing information,

expertise and experience between nations (be it from developed economies to developing economies, or vice versa).

4.1.6 Case studies

43. Annex II lists a total of 15 case studies described and discussed in the final report (Heinsohn 2006) (see section 4.1.1), with a reasonable coverage of the world, developed and developing economies, and covering all stages within the project life cycle (except decommissioning, though one example of revamping and redevelopment was presented). The case studies were selected to illustrate elements of social impact assessment that can be regarded as relevant practice. Where possible, the case studies describe the different methodologies used, the range of data usually collected and the outputs to be developed throughout the social impact assessment process.
44. The consultant's report (Heinsohn 2006) contains an extensive set of references, including Internet links, to the sources of information identified during the study of the issue. The report, which is open for review by the public, can be accessed in the DDP website at www.unep.org/dams/.

4.2 Addressing outstanding social issues

4.2.1 Introduction

45. Outstanding social issues often need to be addressed within the wider context of dealing with existing dams. Opportunities exist to optimize the benefits arising from many existing dams by addressing outstanding social issues, mitigating adverse environmental impacts and undertaking other restoration measures. There is a need to identify and assess the outstanding social issues associated with existing large dams and design and develop mechanisms and processes to remedy them with the involvement of interested and affected communities. These actions could be conceived as components of programmes to restore, improve and optimize the benefits from existing large dams.

46. These results of the study indicate that though much has been written on outstanding social issues, not much has been published on how these issues have been addressed, and hardly anything on the outcomes of the remedial processes. Consequently the findings outlined in the report, from which the contents of this chapter are drawn, should be considered as an introduction to this area that deserves further research efforts in future.

4.2.2 Characterization of the issue

55. Generally speaking, outstanding social issues are unsolved social situations associated with the planning and implementation of dams already in operation. The most common social issues falling within this definition are:

- Ongoing economic and social harm suffered by the communities displaced by the projects;
- Loss of cultural heritage assets;
- Boomtown formation, including problems of integrating construction townships into regional development planning;
- Long-term liability;
- Changes affecting downstream populations.

48. These issues become outstanding because of failures in the planning and implementation of the mitigation measures addressed in the respective environmental and social management frameworks (for example environmental impact assessments, resettlement action plans, indigenous peoples plans and community development plans), or because they only became visible after project implementation (second-generation impacts). Claims on outstanding social issues are usually raised by the affected communities, with or without providing evidence.
49. The review of the literature indicates that the main factors triggering the addressing of outstanding social issues are the desire

of an implementing authority to increase the likelihood of public acceptance of new projects; and the clamour by those affected for remedial action in compliance with the right to remedy as articulated by the Universal Declaration of Human Rights and the International Covenant on Civil and Political Rights (adopted by the United Nations General Assembly, 1948 and 1966 respectively). In the first case, the goal is to reduce the risks of a lengthy and costly project planning and authorization process, which is often confronted by resistance stemming from unsolved outstanding social issues from earlier projects. In the second case, the right to remedy is triggered when a project underperforms and fails to fulfil its obligations as established in project funding agreements or in accordance with international laws or standards.³⁴

50. Outstanding social issues can be discussed in terms of their origin and nature or the measures adopted to remedy them. For this Compendium, the latter approach was adopted for the characterization of the issue. In response to the question of how outstanding social issues in existing dam projects can be addressed, the following main approaches have been found in the literature:

- Compensation (remedy funds): cash, support to livelihood systems;
- Grievance process;
- Restitution;
- Legal process.

4.2.3 Addressing outstanding social issues: Current status in frameworks and in implementation

51. The review of literature and examples of implementation identified during the elaboration of the background information provide the basis for the following discussion. Table 4.2 lists the case studies selected to illustrate the implementation of the issue and its main elements.

(a) Remedy funds and other forms of compensation

52. Remedy funds are implemented in two forms: cash compensation (lump sum or annual instalments) or as a support to livelihood systems. The most common practice to replenish the fund is through the adoption of some form of benefit-sharing mechanism.

53. The **lump sum** stocking and disbursement of funds is easier to manage, has lower transaction costs and provides the recipient with the freedom to use the funds as needed, but embodies the risk that the funds do not necessarily guarantee the long-term economic and social well-being of the project-affected people. While some lump sum payments are made to individuals, others are handed over to organizations representing the project-affected people (for example the James Bay complex, Box 4.9), commissions of all stakeholders (Garzweiler mining), local governments (Garzweiler), or national governments (Danjiangkou Dam). The solution should be tailored to fit local conditions, though the perceptions and expectations of the intended beneficiaries may vary as the context changes (Pak Mun). For this reason, most policies and legal frameworks advise against lump sum compensation (World Bank 2004; OECD 1992).

54. Disbursing the cash compensation in **annual payments** confers flexibility to the remedy fund to react to shortcomings and undesired effects, reducing the risk that the funds are unable to solve all outstanding social issues. China transfers for each kilowatt produced a certain amount into the remedy funds; examples from the United States (Grand Coulee Dam on the Columbia River) and Canada (James Bay complex) involve payment of a fixed annual amount; and in Norway (Glomma-Laagen) a certain percentage of the revenue generated goes to the remedy fund. This approach requires establishing a structure to manage the fund. There are many options for the management (how and by whom) of such a fund – association of project-affected people, local government,

34 Usually three forms of remedy are recognized: restitution, compensation and satisfaction.

Table 4.2 Main elements of outstanding social issues addressed by the selected case studies³⁵

Project	Remedy fund			Grievance processes	Restitution Processes	Legal processes
	Lump sum	Annual instalment	Livelihood restoration			
James Bay complex						
Glomma-Laagen						
Danjiangkou Dam			Post-resettlement & rehabilitation fund			
Pak Mun Dam						
Chixoy Dam						
Tarbela Dam						
Garzweiler mining				Ombudsperson		
Kruger National Park					Restitution of land titles to Makuleke community	
Grand Coulee, Columbia River						Verdict claims by native Americans

commissions of all stakeholders, insurance companies – all with advantages and shortcomings. There is no one-fits-all solution, as the choice of an appropriate mechanism depends very much on the social environment and the interest and will of the various stakeholders.

55. **Support to livelihood systems.** In most cases failure to rehabilitate or improve livelihoods is the root cause of outstanding social issues. It is not strange then that

fulfilling the unachieved commitments is a preferred reparation measure that has been adopted in practice as the main tool to address outstanding social issues. In the examples, most outstanding social issues occurred when a project or government was unable to compensate land for land, or fishing and hunting grounds for a similar resource. Most examples document that it is becomingly increasingly difficult to find land, forests or rivers to rehabilitate the livelihoods of farmers, hunters and fishers

Box 4.9 Remedy fund of the James Bay project, Canada

The state-owned electricity company, Hydro-Québec, in line with their 1970 policies did not provide any specific measures for indigenous populations when they started to develop the various dams and reservoirs of the James Bay hydropower complex. This resulted in significant social issues, particularly the reduced incomes from hunting and fishing due to hindrances to the free migration of fish and loss of breeding grounds of geese and caribou (IEA 2005; DIAND 2003a). The project raised opposition from the indigenous people using the lands affected by the project, who initiated legal action on the basis of unsettled land claims. As a result, the governments of Canada and Quebec, Hydro-Québec, the James Bay Development Corporation and the James Bay Energy Corporation negotiated with the Cree, Inuit and Naskapi (in total around 20,000 people) of James Bay a new treaty whereby, in exchange for their acceptance of the project, their land rights were recognized and exchanged by the agreement and they were granted important administrative powers. The James Bay and Northern Quebec Agreement, signed in 1975, provided for a comprehensive remedy fund to address, among other topics, outstanding social issues. It embodied a lump sum cash compensation of CA\$ 225 million, an annual compensation of around \$2 million and additional support to education, health care, social security and upgrading of communal infrastructure. The agreement was considered by all stakeholders to be a landmark agreement (Courcelles 2003; Denis 2000; DIAND 2003a). It transfers the responsibility to address outstanding social issues to the affected communities and provides them with the funds to do so, thereby empowering the affected people (Roux and Seelos 2004; DIAND 2003a).

35 This table illustrates the main elements of outstanding social issues addressed by the selected examples. The main elements considered reflect those identified in the characterization of the issue. For more detail, see the case studies in the final report of the issue (Schmidt-Soltau 2006). The blue boxes indicate that the topic is addressed and the green boxes indicate that the consultant considers the example to be a particularly informative application.



Mark Edwards/Still Pictures

without affecting other people negatively. This transforms the rehabilitation of livelihoods from a technical problem (how to find similar assets) to a more complex issue, as it requests (forces) the project-affected people to change their livelihoods, which in many situations does not work out (thus creating secondary and third-level outstanding social issues) (World Bank 1996).

56. In developed countries this approach is confronted with the variety of interests of the project-affected people. While in Norway (Glomma-Laagen) voluntary cash compensation has entirely replaced the rehabilitation of livelihoods, the project-affected people in Germany (Garzweiler) needed to appeal to a commission if they did not want to make use of the collective mitigation measures and, instead, receive individual cash compensation.
57. A shortcoming that has been voiced by affected peoples and NGOs is the fact that the affected people have to claim compensation from the fund and provide evidence to receive remedy; thus, they are forced to request something from the project, while it was initially the project that had requested something from them and then failed to fulfil its obligations

(DDP 2004). Due to this, NGOs claim that addressing outstanding social issues should not be based entirely upon claims of the affected people, but should be based on a more effective monitoring and evaluation system that independently verifies whether compliance has been achieved or whether additional outstanding social issues need to be addressed before the construction and implementation process can officially be closed.

(b) Grievance process

58. Separate mechanisms have been provided to address existing grievances outside the project and the current policy and legal framework. One such example is the creation of an ombudsperson at community level to address outstanding social issues through frequent discussions and interactions with affected stakeholders. An ombudsperson is a commissioner mandated to investigate complaints and recommend solutions. This mechanism has also been suggested in policies and normative frameworks³⁶ in the last few years as a response to the inherent difficulties and complexity of dealing with outstanding social issues through legal

³⁶ Resettlement regulations of RWE, Bezirksregierung Köln, Hydro-Québec.

rulings and the limited capacity of projects themselves to reflect critically their own work and fairly assess claims (World Bank 2004; ADB 1998). The Garzweiler example documents how an effective grievance process – in this case independent ombudspersons at community level – is able to address outstanding social issues, even before they are considered outstanding, and increase the frequency and quality of discussions between stakeholders (Box 4.10).

59. The mechanism of an ombudsperson encourages, facilitates and speeds up the addressing of outstanding social issues and enhances the communication and understanding of the different stakeholders. It does this by assisting project-affected people to voice their grievances in the required format and through the relevant institutional structures, requiring that all responses need to be cleared by the ombudsperson and applying the option to investigate independently issues and cases.

(c) Restitution

60. Restitution is an action designed to restore the affected party to the position it would have been in if the intervention had not occurred. Restitution in its original sense in dam projects is only feasible after the decommissioning of the dam and its reservoir. The example of Makuleke, Kruger National Park, South Africa, is certainly a special case, but it also challenges the current understanding of compensation and benefit sharing, as the people of Makuleke have been restored as the legal owners of their land, while a project (in this case the Kruger

National Park) continues to use this land and shares benefits with the land-owning community. Transferring this approach to dam projects would imply that the project-affected people would continue to be the owners of the land occupied by the dam and reservoir, and be entitled to receive rent from the project for this land during the entire project period until eventually receiving the land back if and when the dam is decommissioned. No example could be found where land restitution was used in the context of hydropower projects, but it might be worth considering as a model in which land is not expropriated but leased out for the entire duration of a project.

(d) Legal process

61. The opportunity to obtain a legal opinion on whether an individual or a group has a right to remedy for outstanding social issues is a fundamental right. However, as documented by several of the examples – Canada (James Bay complex), United States (Grand Coulee Dam, Columbia River) and Germany (Garzweiler) – it is a very slow process (Box 4.11). Thus, it should be considered as an approach of last resort, only to be implemented when other mechanisms have failed. The long time, and significant costs, associated with these processes result in social insecurity for the affected people and raise the risk of resistance and conflicts impacting negatively on the public acceptance of new projects. On the other hand, it also has to be said that legal processes do not always solve outstanding social issues, as they are a compliance mechanism to ensure that agreed standards are applied rather than a platform to discuss what the right to livelihood restoration means in practice.

Box 4.10 Grievance process of the lignite opencast mining in Garzweiler, Germany

The position of an ombudsperson for resettlement issues was created in 2001 by the provincial government in all project communities following the request of the operator of the opencast mine (Rheinisch-Westfälische Elektrizitätswerk) to serve as an independent mediator between the company and the affected populations. The ombudspersons receives funds from a remedy fund and interacts closely with the Hardship Commission, which is managing the fund to address the outstanding social issues and grievances raised by the 7,600 resettlers. The position of the ombudspersons involves being available to the resettlers whenever they need assistance and to provide independent advice on all relevant matters, in general, and all form of grievances, in particular (Bezirksregierung Köln 2004). It seems as if the majority of the population is more or less satisfied with their ombudspersons, while environmental NGOs, which have been against the project on ecological grounds, perceive the introduction of ombudspersons as an instrument to split the resistance movement, which earlier had united those protesting due to environmental and social concerns (Heckelmann 2004).

Box 4.11 Legal claims against the Grand Coulee Dam, Columbia River, United States

The United States Bureau of Reclamation constructed the Grand Coulee Dam on the Columbia River between 1933 and 1955 for purposes of hydropower generation and water supply for irrigation. The reservoir stretches for approximately 243 kilometres and generates 6,800 megawatts of power. When it was constructed, the extent of its impact on migration of fish, particularly salmon, and consequently on the livelihoods of the native Americans and Canadian First Nations living upstream of the dam was not adequately taken into account. As a result, the production of salmon and other fish dropped by 50% and caused the loss of access to all or most anadromous fish, which are the centrepiece of the indigenous economy and culture in this area. In turn, the Colville Confederated Tribes filed a suit against the United States in 1951. The Indian Claims Commission ruled in 1978 (27 years after the claim had been filed) that the tribes were entitled to full compensation for all income losses associated with the dam. The government provided in total US\$66 million to compensate past losses of income and subsistence between annual payments of US\$15 million to offset the ongoing reduced income opportunities. Most stakeholders and scientists are of the view that, in cases such as the Grand Coulee, the length of time it takes to solve outstanding social issues through the courts, and the placement of the need for documentation on the affected people, do not enhance the acceptance of dams and hydropower and irrigation projects (Ortolano and others 2000, p. 50–58, 78–79; Beaty and others 1999; Cohen 1986; Marthews and others 2000; Spokane Tribe of Indians 1995; Watkins 2000; Johnston 2000).

4.2.4 Conclusions and recommendations

62. Some policy and normative frameworks promote the use of a combination of mechanisms to address outstanding social issues, such as grievance mechanisms, to make such issues visible as early as possible and to set up remedy funds to provide the means to address them (World Bank 2004). The right to obtain a legal ruling on a project is a fundamental right, which serves as a fallback position if all other mechanisms do not work.
63. To improve the effectiveness and efficiency of a , which guarantees for each project-affected person livelihood restoration or resettlement with development, an efficient long-term monitoring and evaluation system, which identifies outstanding social issues, should be put in place, in the context of a comprehensive approach to address outstanding social issues.
64. Additional research is needed to enhance the knowledge base. This will require undertaking primary research and identifying and assessing additional examples, evaluating the outcomes of remedy funds, studying the relationship between and relative impact of project-affected people, governments and financial institutions in addressing outstanding social issues, and evaluating the outcomes of new

mechanisms such as restitution processes and the institution of ombudsperson.

65. An important aspect of addressing outstanding social issues is the affordability of remedy funds. Often, governments use scarce financial resources to develop a bankable project. They then raise loan finance and build the project. They are then locked into a long loan repayment period, leaving little disposable income for remedy funds. The problem is more profound when the project has little direct income-generating capacity, for example a storage dam for domestic water supply purposes (as opposed to a hydropower dam). This creates difficulties in establishing a remedy fund and may be a factor causing governments to defer addressing outstanding social issues.

4.2.5 Case studies

74. Annex II lists the 10 case studies that were selected to illustrate the different mechanisms utilized to address outstanding social issues. They reflect a reasonable coverage of the world. They are described in the consultant's report (Schmidt-Soltau 2006).
67. The consultant's report contains an extensive set of references, including Internet links, to the sources of information identified during the study of the issue. The report, which is open for review by the public, can be accessed in the DDP website at www.unep.org/dams/.

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5 Compensation policy (focus on benefit-sharing mechanisms)

Summary

This chapter discusses mechanisms that work towards the restoration and improvement of the livelihoods of affected people, including benefit-sharing mechanisms.³⁷ It takes into account the main compensation policy principles put forward by the World Commission on Dams, the World Bank and the International Finance Corporation. These principles have been incorporated to varying extent into the national policy frameworks of some developing countries. These involve ensuring the improved livelihood of affected people, the implementation of developmental approaches, compensating people without formal entitlement to land, enhancing the involvement of affected people in planning and implementation of resettlement plans and indigenous peoples development plans and ensuring compliance with agreements.

Compensation policy mechanisms, in addition to basic in-kind and cash compensation for lost assets and lost access to resources, involve measures that aim to restore and improve the livelihoods of project-affected populations (through livelihood restoration and enhancement schemes, community development schemes, catchment development schemes and monetary benefit-sharing schemes).

Monetary benefit-sharing mechanisms involve sharing part of the monetary flows generated by dam operation with affected communities. Such mechanisms represent a relatively new approach. The main types of monetary benefit-sharing mechanisms are revenue sharing, development funds, equity sharing or full ownership, taxes paid to regional or local authorities and preferential electricity rates. The review of literature and case studies indicate that fundamental elements of successful monetary benefit-sharing schemes are (a) existence of an economic rent and overcoming financial constraints; (b) reconciling the goals of stakeholders; (c) ensuring the efficiency of redistribution of benefits; (d) ensuring the involvement of local communities; and (e) ensuring the accountability of agencies entrusted with the redistribution of benefits.

Regarding monetary benefit-sharing mechanisms, it is concluded that legislation on revenue transfers or development funds need to include mechanisms that ensure effectively that those affected by dams actually benefit from transfer payments. Establishing partnership agreements between developers and local communities is probably the most innovative form of monetary benefit sharing. These

37 DDP commissioned independent expert reviews of the issues of compensation policy and benefit-sharing mechanisms, which were considered to be distinct elements of the strategic priority 'recognizing entitlements and sharing benefits.' Two consultants produced separate but linked reports (Roquet 2006 and Egr_2006). Due to conceptual linkages, their presentations have been consolidated in this chapter, while still highlighting their individual findings, particularly those on the benefit-sharing study, which constitute for the most part relatively innovative approaches.

partnerships are hailed as the most innovative and win-win form of benefit sharing, contributing greatly towards project acceptance by local communities by recognizing the entitlement of affected people to a share of the economic rent generated by a dam and their right to participate in the management of local water resources.

All compensation mechanisms discussed would benefit from further studies, such as post-project assessments of resettlement outcomes based on surveys of local stakeholder representatives and on the outcomes and results of the benefit-sharing mechanisms implemented in the context of each project.

Well established compensation policies for dam projects taking into account these mechanisms can, in developing countries, improve the lives of the affected people and communities by (a) fostering the adoption of appropriate regulatory frameworks; (b) building required institutional capacities; and (c) planning and implementing long-term integrated community development programmes.

5.1 Characterization of the issue

1. One of the key points put forward in recent debates on compensation of affected people is that “dams have made an important and significant contribution to human development, and the benefits derived from them have been considerable” (WCD 2000). These benefits are varied and include power generation, flood control, irrigation, industrial and domestic water supply, navigation and recreation. However, “in too many cases an unacceptable and often unnecessary price has been paid to secure those benefits, especially in social and environmental terms, by people displaced, by communities downstream, by taxpayers and by the natural environment” (WCD 2000). Often, while the primary beneficiaries of dams usually live far away from the dam site, other groups of people in the project-affected area and downstream may sustain most of the negative impacts of dams. Thus, power generation often benefits urban populations and industries located far away from the project-affected area. Water provided for irrigation may benefit small groups of farmers located downstream of the dam. In view of this, dam proponents, operators and regulators need to also set aside support measures for the development and welfare of local and regional communities that are negatively affected by a dam.
2. Successful mitigation, resettlement and development are fundamental commitments and responsibilities of the State and the developer towards affected people. They bear the burden of satisfying all affected people that

moving from their current context and resources will improve their livelihoods. There is a wealth of literature, based on experiences and lessons learnt from a number of projects, addressing the main principles and elements that a modern policy might encompass in order to ensure the compensation of project-affected populations for lost assets and lost access to resources and the restoration and improvement of their livelihoods. This chapter focuses on the mechanisms available to implement such a policy with focus on those sharing the direct or indirect benefits of dams.

5.1.1 Some principles of international policies and guidelines on compensation

3. The set of principles summarized hereafter are found, with some differences, in international compensation policies and guidelines that apply to adversely affected people resulting from large-scale infrastructure projects such as dams. These involve safeguard policies put forward by the World Bank and other multilateral development banks, in the International Finance Corporation’s most recent policy and performance standards, and in the recommendations of the World Commission on Dams. They are referred to by international bilateral aid agencies and financial institutions and to some extent have been incorporated into national policy frameworks in a number of developing countries, including Brazil, Colombia, China and India.
4. **Ensuring the improved livelihoods of affected people.** The World Commission on Dams states that compensation policies and guidelines should be governed

by a general principle of “inducing demonstrable improvements in the standards of living of affected people”. In similar fashion to other international financial institutions, the International Finance Corporation’s Performance Standard 5 on Land Acquisition and Involuntary Resettlement has an objective that resettlement programmes “improve or at least restore the livelihoods and standards of living of displaced persons” (IFC 2006, p. 18). The World Bank’s Operational Policy on Involuntary Resettlement specifies that “Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher” (World Bank 2004b).

5. **Implementation of developmental approaches.** Compensation policies and guidelines emphasize the need for mitigation measures for adversely affected people to be planned and implemented as fully fledged development projects. Resettlement as development policy with supporting legislation involves a combination of land-based and non-land-based sustainable livelihood support packages, strong community participation (including both displaced and host communities) and accountability and commitment from government and project developers (WCD 2000, p. 116).
6. **In-kind compensation in place of cash compensation.** Compensation policies and guidelines emphasize the need for in-kind compensation rather than cash compensation for people adversely affected by dams. In theory, cash compensation at replacement cost allows displaced persons to restore incomes and living standards. In practice, several obstacles have impeded conversion of cash into replacement assets (or alternative income restoration measures). The World Bank’s Operational Policy on Involuntary Resettlement states that “preference should be given to land-based resettlement strategies for displaced persons whose livelihoods

are land-based. These strategies may include resettlement on public land, or on private land purchased for resettlement. Whenever replacement land is offered, resettlers are provided with land for which a combination of productive potential, locational advantages, and other factors is at least equivalent to the advantages of the land taken.”

7. **Compensation of affected people without formal entitlement to the land.** As the World Bank’s Operational Policy on Involuntary Resettlement recognizes, “the most devastating effects of displacement may be borne by individuals or groups who depend on open access to resources, whose customary rights are not recognized or where resource use differs from dominant patterns” (World Bank 2004a). The International Finance Corporation’s Performance Standard 5 on Land Acquisition and Involuntary Resettlement states that “Displaced persons may be classified as persons (i) who have formal legal rights to the land they occupy; (ii) who do not have formal legal rights to land, but have a claim to land that is recognized or recognizable under the national laws; or (iii) who have no recognizable right or claim to the land they occupy.” All are entitled to some form of compensation (IFC 2006). Compensation or assistance is not an entitlement for those who encroach on the project area after the cut-off date for eligibility (which usually corresponds to the date set for the census of affected people).
8. **Enhancing participatory approaches and involving affected people in planning and implementation of resettlement policies and indigenous peoples development plans.** The World Bank’s Operational Policy on Involuntary Resettlement requires that, in cases of involuntary taking of land, “Displaced persons and their communities, and any host communities receiving them, are provided timely and relevant information, consulted on resettlement options, and offered opportunities to participate in planning, implementing, and monitoring resettlement. Appropriate and accessible grievance mechanisms are established for these groups.” The World

Bank's Operational Policy further requires that a resettlement plan or resettlement policy framework includes measures to ensure that the displaced persons are "consulted on, offered choices among, and provided with technically and economically feasible resettlement alternatives" (World Bank 2004a). The World Commission on Dams goes further and states that "for the proposed project to be part of a preferred development plan, the acceptance of the project affected people and the prior informed consent of indigenous peoples should be obtained" (WCD 2000, p. 268).

9. **Prioritizing vulnerable groups.** According to the World Commission on Dams report, "the principle categories excluded from assessments (of people displaced by dams) include the landless (e.g., those without land, legal title or legal status), downstream communities and indigenous peoples" (WCD 2000, p. 116). The report also makes the case that poor people, women and representatives of ethnic minorities or indigenous communities have borne a disproportionate share of the social impacts of major dams in the past. The World Bank's Operational Policy on Involuntary Resettlement states that "To achieve the objectives of this policy, particular attention is paid to the needs of vulnerable groups among those displaced, especially those below the poverty line, the landless, the elderly, women, children, indigenous peoples, ethnic minorities, or other displaced people who may not be protected through national land compensation legislation" (World Bank 2004a).
10. **Ensuring compliance with agreements.** Compensation policies and guidelines emphasize the need for ensuring compliance with agreements and commitments included in resettlement plans and indigenous peoples development plans. The World Bank's Operational Policy on Involuntary Resettlement states that "The borrower's obligations to carry out the resettlement instrument and to keep the Bank informed of implementation progress are provided for in the legal agreements for the project" (World Bank 2004a). Mechanisms promoting compliance with

the resettlement agreements and the use of an independent panel of experts are covered in the Bank's resettlement policy and are routinely resorted to in Bank-supported dam projects. However, governments are ultimately responsible for implementation, coordination and oversight of resettlement programmes. Good practice also suggests the use of trust funds to finance the ongoing obligations for monitoring and auditing, with such activities continuing for the life of the project. Royalties from the dam itself could fund ongoing initiatives. If the dam is constructed by a private sector developer, the developer and the government need to reach an agreement on the developer's responsibility for implementing satisfactory resettlement and the government's responsibility regarding provision of support to acquire land and to provide staff for the schools and other facilities contracted under the resettlement programme. Evolving good practice suggests that agreement between the developer and the government shall include a performance bond, supported by a financial guarantee to be triggered if the developer has not adequately fulfilled its resettlement responsibilities (WCD 2004a).

5.1.2 Compensation policy mechanisms

11. Recent social research (Cernea and McDowell 2000; Cernea 2002; Kanbur 2002; Koenig 2002) indicates that there is a requirement for compensation policies to clearly set out mechanisms to attain the policy objectives pursued under national and international standards. Policy provisions need to clearly establish the key elements to be taken into account to ensure that improved livelihoods, living standards and opportunities are the outcomes of resettlement and development processes.
12. Compensation policy applicable to dam projects is usually implemented through mechanisms that aim to:
 - Compensate project-affected populations for lost assets and lost access to resources;
 - Restore and improve the livelihoods of project-affected populations (through

livelihood restoration and enhancement schemes, community development schemes, catchment development schemes and monetary benefit-sharing schemes).

This chapter mainly discusses the second type of mechanism, pursuing the restoration and improvements of livelihoods.

13. For the purpose of this chapter, compensation mechanisms thus include (a) in-kind or monetary compensation for lost assets or access to resources; (b) non-monetary benefit-sharing mechanisms, which can be defined as benefit-sharing mechanisms that are not tied to monetary flows generated by dam operation; and (c) monetary benefit-sharing mechanisms, which can be defined as benefit-sharing mechanisms that are tied to monetary flows generated by dam operation. Examples of type (b) mechanisms are given in the World Commission on Dams report (WCD 2000, p. 300) and include those that are:

- Project benefit related, e.g. access to irrigated land or to irrigation water, to power or to water supplies;
- Project construction and operation related, e.g. employment or financial and training support;
- Resource related, e.g. preferential access to, or custodianship of, catchment resources;
- Community services related, e.g. improved access to community infrastructure and services, income support;
- Household related, e.g. housing improvements, microcredit.

14. Figure 5.1 illustrates the main mechanisms to be considered within the framework of compensation policy.

5.1.3 Monetary benefit-sharing mechanisms

15. Monetary benefit-sharing mechanisms involve sharing part of the monetary flows generated by dam operation with affected communities. In addition, monetary benefit-sharing mechanisms can be used as a way for a developer to establish



Figure 5.1 Main mechanisms within the general framework of compensation policy

a partnership with local populations, including project-affected populations (if any) or as a means to establish a long-term regional economic development fund. Monetary benefit-sharing mechanisms can thus be implemented even in cases where there are no project-affected people. The interest in such mechanisms resides in their potential to support long-term beneficial partnerships between developers and concerned communities.

(a) Objectives of monetary benefit-sharing schemes

16. Benefit sharing is based on the premise that dam projects may generate a significant economic rent that can be shared with project-affected populations. Economic rent is the surplus return that exceeds the normal return on capital. Such a rent arises because the company is exploiting a natural resource whose development depends on site-specific hydraulic, topographical and geological conditions (Rothman 2000, p. 1–5). Since natural resources are considered public goods, governments, in the name of

the public, may thus try to capture the rent through royalties, fees or other mechanisms and deliver it back to the public. This is common practice in the oil and gas, mining, forestry and fishing sectors. It is rare, however, in the hydroelectric power sector, where governments typically regulate tariffs in such a manner that the resulting rent flows to electricity consumers in the form of lower tariffs. Those who consume more electricity will get more of the rent and, depending on conditions in the exported goods market, some of the rent can even go to foreign customers. The situation is similar in the case of other water uses made possible through dams. Irrigation fees, water fees or navigation fees generally reflect at best the actual cost of the dam. In the case of flood control, populations benefiting from reservoir storage capacity generally do not pay for this benefit.

17. However, ethical considerations may justify that part of the rent be channelled to project-affected populations. Indeed, in many cases, project-affected people sacrifice their access to and use of local natural resources that contribute to project development. In addition, the sharing of economic rent can also be used to finance long-term regional economic development funds and to establish long-term partnerships between developers and concerned communities. These three objectives are discussed below.
18. **Providing additional long-term compensation to project-affected populations.** In the case of dam-induced forced population displacement, research shows that compensation for lost assets is not alone sufficient to secure the productive and enduring re-establishment of those displaced. Benefit-sharing mechanisms are generally considered as one of the most important means required for complementing cash compensation and other measures conceived within the framework of a compensation policy. Therefore, one of the key elements to be taken into account in compensation policies is the sharing of part of the benefits

generated by the operation of the dam with affected communities, as recommended by the World Commission on Dams, the International Energy Agency's guidelines on hydropower and the environment (IEA 2000) and the International Hydropower Association's sustainability guidelines (IHA 2004). Another reason for implementing benefit-sharing mechanisms is that existing guidelines fail to capture the full social costs of displacement-related impacts. "Proper socio-economic re-establishment requires more than paying the fair market value of the condemned land ... the stream of benefits created by the project should also be tapped to provide direct benefits and resources for resettlers" (Van Wiclin III 1999, p. 233). This need to provide additional compensation to project-affected people is recognized in the legislation on revenue transfers from hydropower projects in countries such as Norway, Nepal and Brazil. These principles were recently supported in the Beijing Declaration on Hydropower and Sustainable Development (United Nations Division for Sustainable Development 2004).

19. **Establishing long-term regional economic development funds.** In poorer regions that have untapped water resources, dam projects can be planned as part of a regional economic development plan. Such a plan can take into account all resource potentials in the region as well as opportunities created by the reservoir and by access roads built for the construction of the dam and power plant. These new opportunities may include reservoir fisheries, irrigated agriculture, better access to markets or improved navigation. Part of the funding to implement the plan may be provided by channelling a portion of the benefits from the dam project to local and regional communities by means of, for example, a development fund. This approach is illustrated by the Lesotho Fund for Community Development and the Hubei Hydropower Development in Poor Areas project. Development funds can also be set up to provide additional long-term compensation to project-affected

populations, as illustrated by the Chinese legislation on post-resettlement and rehabilitation for hydropower projects.

20. **Establishing a partnership between developers and local communities.**

Establishing partnership agreements between developers and local communities is probably the most innovative form of benefit sharing. Partnership agreements can take various forms depending on the development priorities of local communities, such as part or full community ownership of the dam project or community development funds. For the developer, a partnership provides an assurance of the local acceptance of the project, thereby reducing the level of risk and the cost of lengthy feasibility studies and authorization processes. For the local communities, it is recognition of their entitlement to a share of the economic rent generated by the dam as well as a say in the management of local water resources. Such mechanisms (a) provide a source of funding over the long term; (b) enable local and regional entities to set their own priorities and to minimize their dependency on the developer and the State; and (c) facilitate adaptive management. Examples of partnership agreements include Hydro-Québec's approach on partnerships with indigenous communities and with local communities and the Proyecto Hidroamazónico (PROHA) in Ecuador.

(b) **Types of monetary benefit-sharing schemes**

21. The following can be considered the main types of monetary benefit-sharing mechanisms. It is important that such mechanisms are geared in such a way that they actually benefit those negatively affected by a dam project:

- **Revenue sharing.** Because exact measurement of the economic rent from dam projects is difficult, revenue sharing through taxes on revenues or royalty regimes has often been used to attempt to capture some of the rent, without explicitly measuring it. Such mechanisms may be the result of

negotiations between local or regional authorities and the promoter or may be defined in the legislation. In the latter case, the percentages of revenues that would be transferred to regional or local beneficiaries, and the destination of the proceeds, are generally specified.

- **Development funds.** Development funds financed from, for example, power sales and water charges may be established to provide seed money for fostering economic development in the project-affected area.
- **Equity sharing or full ownership.** A variety of mechanisms may allow local or regional communities to partly or fully own a dam project. Local authorities thus share the risks of the venture but also its profits, if any. Moreover, they may in certain cases gain a degree of control over the design and operation of the project.
- **Taxes paid to regional or local authorities.** Two main types of taxes paid to regional and local authorities can be considered. In some countries, the State allows local or regional authorities to directly tax dam owners on the dam's property value or other basis. Taxes to be paid to regional and local authorities can also be defined in State legislation, sometimes as a percentage of project sales or net income. In the latter case, this mechanism is similar to revenue sharing.
- **Preferential electricity rates or other water-related fees.** This mechanism is a form of revenue sharing since it results in less revenue for the dam owner and in avoided costs for beneficiaries.

5.2 **Non-monetary benefit-sharing mechanisms: Current status in frameworks and in implementation**

5.2.1 *Normative frameworks*

22. Non-monetary benefit sharing mechanisms would reflect the development strategy element of a comprehensive compensation policy. Until recently, few developing countries had put into place comprehensive compensation and resettlement normative and policy frameworks. As a result, over

Table 5.1 Main elements of non-monetary benefit-sharing mechanisms addressed by the selected case studies³⁸

Examples of implementation	Livelihood restoration and enhancement	Community development	Catchment development
Arenal Dam, Costa Rica (1980)	Sustainable agricultural employment		
Salto Caxias Dam, Brazil (1998)	Sustainable agricultural and non-agricultural employment		
Urrá 1 Dam, Colombia (2000)	Sustainable agricultural employment		
Laforge-1 Dam, Canada (1994)			Environmental enhancement of catchment resources
Sainte-Marguerite-3 Dam, Canada (2002)	Local employment during construction and operation		
Saguling and Cirata Dams in West Java, Indonesia (1988)	Reservoir fisheries		
Shuikou Dam, China (1996)	Sustainable agricultural and non-agricultural employment		
Chamera (1994) and Uri (1997) Dams, India		Roads, schools and health services	
Maguga Dam, Swaziland (2002)	Commercial irrigation agriculture	Roads, schools, and health services	
Ghazi Barotha Dam, Pakistan (2003)	Sustainable agricultural and non-agricultural employment		

the years international development agency guidelines have played an important role in many development-induced resettlement programmes. More recently, international financing institutions such as the World Bank have also played an important role in the development of national compensation and resettlement normative and policy frameworks. Increasing numbers of national governments are formulating resettlement guidelines and a few, such as China, appear to have these guidelines firmly in view when planning and undertaking project-induced resettlement programmes.

23. The World Bank's involuntary resettlement normative framework has been particularly influential in shaping the policies of other donors and the World Bank Group's guidelines on involuntary resettlement (including those of the International Finance Corporation) are often used as a reference by potential public and private sector investors in dam projects. However, certain aspects of the World Bank's normative and policy framework for involuntary resettlement related to the livelihood improvement of affected people have recently been called into question by the human rights-oriented approaches

of many United Nations agencies, by the World Commission on Dams report (WCD 2000) and by a number of bilateral donor agencies and international NGOs.³⁸

5.2.2 Implementation

24. The review of the state of practice concerning the implementation of non-monetary benefit-sharing mechanisms related to restoration and improvement of the livelihoods of affected people was the basis for the selection of a set of examples depicted in Table 5.1. Section 5.3 deals separately with monetary benefit-sharing mechanisms.

³⁸ The background report on compensation policy contains an overview of international normative and policy frameworks related to involuntary resettlement based on Rew, Fisher and Pandey 2000; Hildyard and Gilfenbaum 2005; and ADB 2003.

³⁹ This table illustrates the examples selected to illustrate non-monetary benefit-sharing mechanisms. For more details, see the case studies in the consultant's report (Roquet 2006). The blue boxes indicate use of the approach, and the green boxes indicate that the consultant considers this example to be a particularly informative application.

25. The 10 examples presented in the background report on compensation policy to illustrate these particular mechanisms reveal a number of interesting points. For instance, the oldest case discussed in the report, the Arenal Dam in Costa Rica, which was commissioned in 1980, did not benefit from a sophisticated normative or policy framework but rather from the strong commitment of government and power utility authorities and the support of Inter-American Development Bank partners. Resettlement planners were prepared to experiment and try out a variety of solutions with project-affected persons in order to ensure that displaced persons were better off after the project.
26. In contrast, the more recent Latin American cases involving the Salto Caxias Dam in Brazil (commissioned in 1998) and the Urrà-1 Dam in Colombia (commissioned in 2000) illustrate the benefits offered by clear and forward-looking national normative and policy frameworks for involuntary resettlement in the electricity sector in both countries. Both projects resulted in outcomes for affected people that did not require significant involvement by outside parties such as international development banks. In the case of the Salto Caxias hydroelectric project (Box 5.1), compensation and resettlement programmes were designed on the basis of a multistakeholder consultation forum, an approach that was also later adopted for the Ghazi Barotha hydroelectric project in Pakistan.
27. The two Canadian examples, based on the Laforge-1 (Box 5.2) and the Sainte-Marguerite-3 Dams in Quebec

Box 5.1 Salto Caxias Dam, Brazil

The Salto Caxias hydroelectric power plant on the Iguacu River has a reservoir capacity of 180 square kilometres and generates 6,500 megawatts of power. It was built by Companhia Paranaense de Energia (COPEL) between 1995 and 1999. Reservoir impoundment involved the flooding of 1,120 rural properties in nine municipalities and the relocation of 1,200 families, among which 900 were either owners of small properties or landless families. Following opposition to the project from the local population, COPEL set up in 1992 a multidisciplinary study group (GEM CX) composed of different levels of government authorities and of NGOs and which provided a democratic forum to discuss indemnity rights and resettlement. GEM CX discussions led to the signing of agreements with representatives of the affected people. Such an agreement of 1993 defined the guiding principles and approaches of the indemnification and resettlement programme that was to be developed. It was elaborated in consultation with the representatives of affected people and had two aspects: (a) indemnification of landowners at market value as established by a survey carried out by a mixed commission; and (b) a resettlement programme offered to small farmers and to landless workers, which provided for collective resettlement or for a letter of credit for individual resettlement.

Its implementation resulted in relocation and livelihood rehabilitation of a total of 626 families. The 232 others eligible for this programme settled for individual projects. COPEL convinced the affected municipalities to devote 10% of the royalties they were receiving from the project to implement a regional economic development plan. This created a big impact on the economy of the nine municipalities, which had been relatively stagnant since the 1980s. In 2000, municipal development funds helped to create 50 new small businesses with more than 300 direct jobs.

Box 5.2 Laforge-1 hydropower generating station, Canada

The Laforge-1 hydroelectric project is one of the later projects of the La Grande complex developed from the 1970s to the 1990s by Hydro-Québec in the James Bay territory in northern Quebec. The Laforge-1 Dam has a reservoir size of 1,288 square kilometres and is mainly for hydropower generation. The La Grande complex undertaking led to the signing in 1975 of the James Bay and Northern Quebec Agreement between the developers and the Cree indigenous communities inhabiting the area. Subsequent agreements were signed, such as the Opimiscow-La Grande Agreement (1992) providing for the construction of the Laforge-1 and other projects. The Laforge-1 Dam, located on the Laforge River, was built between 1989 and 1994 by the James Bay Energy Corporation, a subsidiary of Hydro-Québec. The project did not involve any acquisition of private land but it brought about flooding of prime hunting and trapping grounds and created significant navigation and access problems for Cree families using the area. The 1992 agreement provided (a) a community fund dedicated to the use of the Cree communities; (b) a remedial measures fund dedicated to carrying out remedial works; and (c) a fund aiming at supporting hunting and trapping activities, which are culturally important for the Cree. The remedial works were to be carried out by the James Bay Energy Corporation and the Opimiscow-Sotrac Companeé, a joint Cree, James Bay Energy Corporation and Hydro-Québec non-profit organization.

The Opimiscow-Sotrac Companeé developed a project development framework based on consultation with the affected persons and host communities.

Monitoring studies undertaken by Hydro-Québec in 1999 in collaboration with Environment Canada, one of the regulatory agencies, showed that the improvement of access to the territory resulted in an increased number of Cree camps in the area and that the success of measures aimed at improving wildlife habitat was variable but that the number of waterfowl in the area had substantially increased.



Karl Sommerer/UNEP/Still Pictures

(commissioned respectively in 1994 and 2002), involved the use of lands traditionally used by indigenous communities for hunting, trapping and fishing activities. In addition to monetary compensation to support community development and traditional activities and as a form of compensation for lost habitats and wildlife resources, both projects led to the negotiation of agreements

that enabled indigenous communities to contribute actively to the planning and implementation of environmental remediation and enhancement activities for wildlife in the dam's watersheds. The Sainte-Marguerite-3 project also adopted an integrated enhancement programme and innovative project implementation practices to optimize local economic spin-offs and training and employment benefits.

28. The two Indonesian cases, based on the Saguling and Cirata Dams commissioned in 1988 in West Java, constitute extensively studied examples of implementation of an early version of 14 the World Bank's involuntary resettlement guidelines (1980) and are remarkable for their use of reservoir fisheries as an alternative means of restoring incomes in displaced communities. The Chinese case, based on the Shuikou Dam, commissioned in 1996, constitutes an example of implementation both of new Chinese resettlement regulations for large and medium-sized dams (1991) and, to a lesser extent, of a later version of the World Bank's involuntary resettlement guidelines (1990). The restoration of incomes in communities displaced by the Shuikou Dam was achieved largely due to the willingness of Chinese authorities to stimulate the development of sustainable agricultural and non-agricultural employment opportunities in the project area through a flexible and adaptive process (Box 5.3).

Box 5.3 Shuikou Dam, China

The Shuikou hydroelectric dam, located on the Min Jiang River, was built by the Fujian Provincial Electric Power Bureau (FPEPB) between 1987 and 1996. The dam has a reservoir size of 300 square kilometres and was developed mainly for hydropower generation. The Shuikou resettlement planning occurred in the early 1980s in the context of an emerging legal and regulatory framework in China. Following mounting pressure from people relocated by the construction of some 70,000 dams, including 300 large-scale dams, over a 40-year period, new policies were adopted that provided for restoration of incomes of affected people.

The Shuikou project caused the relocation of about 15,600 rural families (67,239 persons) and 20,000 urban-based people, mainly in Nanping. The Fujian Shuikou Resettlement Planning Team, set up by FPEPB, prepared a resettlement plan following extensive consultations with affected leaders. The plan, which was adapted over time to the new regulations, integrated Chinese resettlement regulations and, to a lesser extent, a 1990 version of the World Bank's involuntary resettlement guidelines. The resettlement plan provided for relocation in consolidated villages or for dispersed resettlement. Displaced persons were given serviced lots and were responsible for building their own houses using compensation payments. Compensation for buildings was based on replacement cost and compensation for lost production was based on pre-established rates. Significantly, the resettlement plan included an economic rehabilitation plan aimed at creating new production systems for affected people.

The implementation of the Shuikou resettlement plan coincided with a period of rapid economic development in the province of Fujian. This facilitated the economic rehabilitation of resettlers but this inflationary environment caused the resettlement budget to be revised.

Box 5.4 Maguga Dam, Swaziland

Resettlement and compensation for the Maguga Dam was guided by the resettlement and compensation policy document signed in 1996 by Swaziland and South Africa and implemented through the environmental impact assessment and compensation management plan. The Maguga Dam was built by the Komati Basin Water Authority (KOBWA) between 1998 and 2002. The dam built on the Komati river is 115 metres high and was built mainly for purposes of supplying water for irrigation. The Maguga Dam affected 125 homesteads, causing the relocation of approximately 35% of these. The compensation policy involved three types of resettlement packages: free choice resettlement, resettlement in the same chiefdom and resettlement in a host area. Compensation for loss of structures was calculated at replacement value plus 10% to 20%, depending upon the type of compensation. The two last packages of compensation involved land-for-land compensation. As stated in the compensation management plan, KOBWA put into place a participation structure, the Ekuvinjelweni Resettlement Committee, which represents the affected people.

In the host area, KOBWA provided roads, electricity and educational and health services. Most of the affected people did not have access to good educational and health services before the project. Fruit trees were replaced by the planting of saplings and a 97-hectare irrigated sugar cane field was planted. Other measures were also provided to improve livestock production in the host area. A total of 65 homesteads have been constructed in the host area. At the request of the Ekuvinjelweni Resettlement Committee, the affected people were put in charge of completing the construction of housing for the free choice and host area packages. They were also awarded the contracts for fencing and sugar cane planting and completed construction of the community church and agricultural shed. KOBWA was to provide the affected people with training and technical support for three years following project completion. The hiring of labour for the dam was restricted to residents of the project area and many types of infrastructures were planned to enhance livestock production in the dam area.

29. The case of the Maguga Dam in Swaziland (commissioned in 2002), whose development was linked to the signing of the Treaty for the Joint Development and Utilization of the Resources of the Komati Basin between South Africa and Swaziland (1992), is of particular interest because it involves an irrigation dam built to support commercial agricultural ventures as a means of contributing to poverty alleviation in rural areas. The implementation of the Maguga Dam resettlement and compensation policy (1996) was largely based on the development of sustainable agricultural employment (Box 5.4).
30. The case of the Ghazi Barotha hydroelectric project, commissioned in 2003 in Pakistan, constitutes another example of implementation of a relatively recent version of the World Bank's involuntary resettlement guidelines (1990). This example is also of interest because it involved the requirement to address outstanding compensation claims from the Tarbela Dam, built 7 kilometres further upstream on the Indus River (Box 5.5).

Box 5.5 Ghazi Barotha hydropower project, Pakistan

The Ghazi Barotha Dam, located on the Indus River, was built between 1995 and 2003 by the Pakistan Water and Power Development Authority (WAPDA). The project with a dam pond and embarkment area of 1,180 hectares was undertaken mainly for purposes of hydropower generation. The project, was partly funded by the World Bank and involved the application of the World Bank's Operational Directive 4.30 on involuntary resettlement. Considering the outstanding compensation issues related to the Tarbela Dam, built 20 years earlier, one of the World Bank loan's objective was to strengthen WAPDA's capability to address resettlement issues. The World Bank therefore attempted to ensure that project preparation followed best practices and the loan included a comprehensive set of monitoring arrangements, such as the setting up of the Environment and Resettlement Review Panel of Experts, which included NGO representatives. The project required the relocation and rehabilitation of 179 families and affected the land of approximately 20,000 households in 54 villages located in three districts.

The resettlement action plan called for the creation of a project NGO to carry out various resettlement activities, including an integrated regional development plan to find locally acceptable solutions to grievances. The resettlement action plan provided for cash compensation for loss of production and acquisition of land at market value as determined by a land valuation committee. The plan provided people losing all their landholdings with a part of lands on spoil banks and an amount in cash to ensure their livelihood during the transition period.

In 1996 and 1997, the land valuation process became highly politicized and land acquisition prices rose rapidly and caused the project to be halted. The project NGO was mandated to resolve the issue and was able to reduce land acquisition costs. A 2004 survey indicated an improvement in the quality of residences and an increase in the mean per capita annual income of project-affected people. Unfortunately, the spoil bank restoration component of the resettlement action plan was jeopardized by the fact that the contractor and WAPDA put the focus on completing the power channel and did not handle the restoration works with care. Project construction was affected by the 1999 military coup and the war in Afghanistan. The project NGO encountered problems in receiving funding for the integrated regional development plan from WAPDA, which was facing financial difficulties. Implementation of the resettlement action plan may have benefited from a more continuous commitment from the developer and a more secure and independent source of funding.

5.3 Monetary benefit-sharing mechanisms: Current status in frameworks and in implementation

5.3.1 Normative frameworks

31. When the benefit-sharing framework is defined in legislation, it often takes the form of transfers of part of the revenues from hydropower projects to municipalities or regional entities. This is the case in the Colombian, Brazilian and Nepalese legislations. These legislations do not directly address the project-affected people. However, these people may benefit from the infrastructures and services put in place with the funds received from the projects. This type of legislation can thus be considered as a positive step towards equitable sharing of benefits from hydropower development, provided sound mechanisms are implemented to manage the funds received by municipalities or regional entities. However, for the examples selected, no comprehensive follow-up studies could be found concerning the opinions of involved stakeholders or the use of those funds and how they benefited project-affected people.
32. Chinese legislation also comprises a revenue transfer mechanism that takes the form of later-stage support funds to resolve outstanding problems resulting from dam-induced population displacement. These funds are financed from power sales and managed by the provincial resettlement bureaus. This legislation demonstrates the commitment of Chinese authorities to achieve full restoration of the livelihood of the resettled people. However, no follow-up studies that evaluate the performance of such funds could be found. Another example of revenue transfer is the Paix des Braves Agreement between the government of Quebec and the Grand Council of the Crees in Canada. This agreement is also an interesting example of further recognition of the rights of indigenous communities to have a say in the management of natural resources on their ancestral lands.
33. Norwegian legislation includes a variety of mechanisms: revenue sharing, equity sharing, development funds, property taxes and preferential electricity rates. This legislation explicitly recognizes that project-affected people, as part of the populations of municipalities in which water resources are exploited, must receive a share of the project benefits, over and above mitigation and compensation measures that are included in project design (Box 5.9).
34. Legislation may also be enacted to set up development funds such as the Columbia Basin Trust in Canada and the Lesotho Fund for Community Development. These funds provide the only examples of explicit measurement of the economic rent generated by dam projects. The Columbia Basin Trust exemplifies several approaches that maximize the efficiency of such funds, for example the setting up of provisions that foster the active involvement of community organizations in the project-affected area. The Lesotho Fund for Community Development encountered many problems that illustrate the importance of establishing and implementing sound institutional procedures to manage such funds.
35. A monetary benefit-sharing framework may also be part of an agreement between a government and local or regional authorities with regards to the exploitation of natural resources, such as the aforementioned Paix des Braves Agreement between the government of Quebec and the Grand Council of the Crees in Canada.
36. Finally, electricity producers and distributors may define a participatory approach with local communities that may result in partnership agreements that take the form of monetary benefit-sharing initiatives. As further described below, partnership agreements between developers and local communities are probably the most innovative form of monetary benefit sharing.

5.3.2 Implementation

37. The review of the state of practice concerning the implementation of the main elements related to monetary benefit-sharing mechanisms was the basis for the

selection of a set of examples depicted in Table 5.2.

38. The characterization of the benefit-sharing issue and the examples used to illustrate its main elements suggest that the performance of monetary benefit-sharing mechanisms largely depends upon the way these mechanisms are conceived and implemented. The following elements reflect the main aspects underpinning the

design and implementation of monetary benefit-sharing mechanisms (Egré, Roquet and Durocher 2002):

- Existence of an economic rent and financial constraints;
- Reconciling the goals of stakeholders;
- Ensuring the efficiency of benefits redistribution;
- Ensuring the involvement of local communities;

Table 5.2 Main elements of monetary benefit-sharing mechanisms addressed by the selected case studies⁴⁰

Example of Implementation	Revenue sharing	Development funds	Equity sharing	Property taxes	Preferential electricity rates
Itaipu (1980s)					
Urrá-1 (2000)					
Jondachi (planning stage)					
Glomma and Laagen (1970s), Tokke (1960)	Variety of mechanisms: licence fees, tax on profit, etc.				Delivery of part of electricity production to local authorities at cost
Duncan (1968), Keenleyside 1969) and Mica (1975)		Explicit measurement of economic rent; involvement of community organizations			
Minashtuk (2000)			Local community is majority shareholder; Long-term power purchasing agreement		
Toulnoustouc (2005)					
Eastmain-1, Eastmain-1A and Rupert Diversion (2011)					
Shuikou (1996)		Legislation enacted since 1981			
Dongping, Najitan, Songshuling and Xiakou (Hubei) (first unit: 2005)					
Kali Gandaki (2002)					
Lesotho Highlands water project (2004)					

40 This table illustrates the examples selected to illustrate monetary benefit-sharing mechanisms. For more details, see the case studies in the consultant's report (Egré 2006). The blue boxes indicate use of the approach, and the green boxes indicate that the consultant considers this example to be a particularly informative application.



Poulsen/UNEP/Still Pictures

- Ensuring the accountability of agencies entrusted with benefits redistribution.

(a) Existence of an economic rent and financial constraints

39. The economic rent from dam projects is difficult to measure and benefit-sharing mechanisms generally capture some of the rent without explicitly measuring it. However, the prerequisite to benefit sharing is the very existence of such a rent, the measurement of which forms the basis

for determining what can be shared with the project-affected population. Even if the existence of an economic rent can be demonstrated and measured, it does not mean that monetary flows from dam operation allow for benefit redistribution independent of other circumstances. This may occur in situations such as regulated electricity rates that do not cover the actual supply cost of generating power; benefit transfers based on a percentage of revenues that result in financial losses for the dam

owner; and irrigation fees that do not recover capital cost.

40. Government subsidies may be used to balance financial flows when they can be justified on the basis of an economic analysis, for instance when it can be demonstrated that flood control benefits (which do not accrue to the dam owner but are real for the society and can be major) exceed dam capital and operation costs. The sum of profits accruing to the dam owner, of benefits accruing to local communities and of taxes on profit or water use fees collected by the government, should not exceed the economic rent.
41. In practice, only two examples, the Columbia Basin Trust (Box 5.6) and the Lesotho Fund for Community Development, are based on an explicit measurement of the economic rent. Revenue transfers through taxes on revenue or royalty regimes implicitly or explicitly recognize the existence of an economic rent. For instance, the rent tax in Norway is justified by assuming the existence of an economic rent without explicitly measuring it. Equity sharing, in turn, such as in the case of the Minashtuk project, does not require the explicit measurement of the economic rent but the design of this mechanism is based on the assumption that the project will generate profits that reflect at least part of it.

(b) Reconciling the goals of stakeholders

42. Defining monetary benefit-sharing mechanisms is a complex task that involves reconciling the interests, goals and values of the following four categories of stakeholders :
43. **Developers.** Developers bring capital as well as technical and managerial

expertise to build and operate the project. Hydroelectric projects require a high level of investment. They require a long lead time before entering into operation and their period of use typically extends over several decades (50 to 100 years). Payback periods are thus much longer than for most other electricity generation projects. Under such conditions, any mechanism such as equity sharing that may lower the risk of social, institutional and political unrest in the long term will be highly valued by developers. Developers will also favour reaching a consensus with interested parties over project design and project benefits early on in the planning process so as to avoid unnecessary expenditures and efforts.

44. **Project beneficiaries.** Dam projects are often multi-purpose projects that generate significant benefits over and beyond issues related to monetary benefit sharing with affected populations. Most project beneficiaries are generally located far away from the dam site and expect to benefit from the services provided by the dam at the lowest price or fee possible, or even for free. Most beneficiaries have little or no knowledge of local and regional impacts related to dam construction and operation.
45. **Local communities, project-displaced and other affected people.** Dam construction and operation affect to various degrees the uses of water resources and other resources as well as the ways of life of regional and local populations. In addition, project-affected people form heterogeneous groups with regards to occupations, revenues, values, education and social organization. Several subcategories can thus be generally defined in relation to expectations and issues raised by a dam project. Local communities can claim entitlements to a share of project benefits as they contribute

Box 5.6 Columbia Basin Trust

The Columbia Basin Trust was created in 1995 to address outstanding environmental and social issues of existing dams in the Canadian part of the Columbia River basin. This followed repeated claims from project-affected people and was made possible by the existence of a significant rent generated by the projects built under the Columbia River Treaty signed between Canada and the United States in 1961. Part of this rent is used to finance the Columbia Basin Trust. The trust exemplifies several approaches that maximize the efficiency of benefit-sharing mechanisms, particularly several provisions providing for the active involvement of community organizations in the project-affected area.

to project development by sacrificing – voluntarily or not – their access to or use of natural resources in the project-affected area. As Cernea (2002) points out: “Those who give their lands to the new project are in fact ‘investors of equity’ in those new projects. As investors they are entitled to a share of the benefits.”

46. **The State.** Many institutions are involved in dam projects, for example agencies involved in land use and resource management, manpower, health or economic development. Furthermore, the State has the responsibility to establish legal guidelines for the use of natural resources and, when required, for solving dilemmas raised by projects that exploit such resources.
47. The equity-sharing type of benefit-sharing mechanism used within the framework of a partnership agreement, such as the Minashtuk project (Box 5.7) and the Jondachi project, is based on the principle of reconciling the goals of the developer and the local communities. All other types of benefit-sharing mechanisms are largely defined by the State itself, which generally specifies the destination of the funds that are transferred to local or regional authorities, such as in the case of the

Chinese legislation on post-resettlement and rehabilitation for hydropower projects (Box 5.8).

(c) Ensuring the efficiency of benefits redistribution

48. Especially in the case of legislation establishing revenue-sharing mechanisms through taxes or royalties, the process used to transfer revenues to project-affected populations may contain steps, provisions and safeguards to ensure that the goals of the mechanism are achieved, particularly as regards mechanisms aiming at providing additional long-term compensation to affected populations. Clearly stated goals can help define possible uses of the funds. Separate budgets may be established for each category of use. Local community governments, which are sometimes ill equipped to manage large sums of money and complex procedures, can be assisted to strengthen their institutional capacity.
49. In practice, legislation on revenue transfers or development funds presented in the consultant’s report, such as the Brazilian legislation or the Lesotho Fund for Community Development, do not ensure that those affected by dams actually benefit from transfer payments, because one or several of the conditions described above

Box 5.7 Hydro-Québec’s partnership approach with aboriginal communities: The Minashtuk hydroelectric project

Hydro-Québec is an electricity producer and a major North American distributor owned by the government of the province of Quebec in Canada. Under Hydro-Québec’s 1998–2002 strategic plan, three essential conditions must be met for Hydro-Québec to undertake any new project: (a) the project must be profitable under market conditions; (b) the project must be environmentally acceptable according to the principles of sustainable development; and (c) the project must be well received by local communities. The 9.9-megawatt Minashtuk project, commissioned in 2000, illustrates this approach. The Minashtuk project on the Mistassibi River, with a capacity of 9.9 megawatts, was developed mainly for hydropower generation. The Minashtuk project constitutes an equity-sharing type of benefit-sharing mechanism used within the framework of a partnership agreement between the Montagnais community of Lac Saint-Jean and Hydro-Québec. A determining factor of success for this type of mechanism is the capacity of the local community to invest and borrow funds. In the Minashtuk case, the limited partnership form of company used to develop the project and Hydro-Québec’s commitment to buy all of the electricity generated by the project under a 20-year contract provided the necessary conditions for the local community to borrow and invest.

Box 5.8 Chinese legislation on post-resettlement and rehabilitation funds

The 1991 Chinese regulation establishing post-resettlement and rehabilitation funds (revised in 1996) recognizes that, even with well-planned resettlement, remedial measures still have to be taken beyond the end of the relocation period to address outstanding issues. Under this legislation, hydropower projects and water conservancy projects must set up a later-stage support fund to help resettlers develop new production systems and resolve outstanding problems. The fund is established for 10 years and is financed from power sales, with funding provided on the basis of the maximum allowed rate. This legislation applies to the Shuikou project, details of which are in Box 5.34.

are often not met. The Columbia Basin Trust (Box 5.6), however, exemplifies several approaches that maximize the efficiency of benefit-sharing mechanisms, in particular the funding of activities covering a wide array of economic, environmental and social objectives, all contributing to sustainable development in the project-affected area. The efficiency of benefit-sharing mechanisms, other than equity sharing, generally depends on the existence of a strong and sophisticated public administration system, such as in the case of the Norwegian legislation relating to taxes and licence fees (Box 5.9).



(d) Ensuring the involvement of local communities

50. The project-affected population needs to be meaningfully involved in defining the provisions of the benefit-sharing mechanism and these provisions need to be viewed as fair by those affected. The project-affected population is indeed best placed to decide what constitutes an improvement in their quality of life and has first-hand knowledge of local and regional potentials and constraints. A benefit-sharing mechanism thus needs to allow for the involvement of concerned populations in the design of the benefit-sharing mechanism and the use of their share of the benefits received from the dam project. Partnership agreements that gain the support of all stakeholders involved, such as in the case of the Jondachi project, illustrate the meaningful involvement of local communities.

(e) Ensuring the accountability of agencies entrusted with benefits redistribution

51. Transfers of money to local communities may represent substantial sums, raising the concern that they may not be used in the manner intended by an agreement or by relevant legislation, or that they may be subject to embezzlement and corruption. The accountability of implementing agencies entrusted with the redistribution of benefits is thus a basic requirement. A transparent process involving all stakeholders, with public disclosure of how benefits are invested and independent audits, would provide greater assurances that the proceeds are effectively spent on projects that truly benefit project-affected communities. The information collected for the examples did not enable

Box 5.9 Norwegian legislation relating to taxes and licence fees

The Norwegian legislation comprises a number of mechanisms that ensure benefit sharing from water management and hydropower projects with regional and local communities. These mechanisms fall under three categories: (a) provisions included in licences pursuant to the 1917 Water Regulation Act; (b) taxes paid to regional and local authorities; and (c) revenues received by counties and municipalities in the form of dividends. Such mechanisms explicitly recognize that project-affected people, as part of the populations of municipalities in which water resources are exploited, must receive a share of the project benefits, over and above mitigation and compensation measures that are included in project design. However, at least in the Glomma-Laagen region, such revenues represent a relatively small percentage of the revenues of the municipal sector. Moreover, the tax system in Norway implicitly does not recognize that municipalities with more hydropower installations on their territory should receive more tax revenues from power companies, since larger tax revenues are compensated by lower state subsidies.

an evaluation of this crucial element, which merits examination in a subsequent study.

5.4 Conclusions and recommendations

5.4.1 Compensation policy frameworks

52. Compensation policies for dam projects in developing countries that take into account the above mentioned mechanisms may best ensure a prompt and measurable improvement of the lives of affected people and communities by:

- **Fostering the adoption of appropriate regulatory frameworks.** The regulatory and institutional aspects associated with resettlement are often difficult to address. Changes to legislative or institutional frameworks require the active involvement and commitment of the governments concerned;
- **Building required institutional capacities.** This addresses the need for an institutionalized project planning process; the need to ensure the participation of all groups affected by the projects in the decision-making process; and the need for reinforced local land management capabilities;
- **Planning and implementing long-term integrated community development programmes.** A component of such programmes would be the direct replacement of losses incurred by individuals and communities as a result of project activities, with all compensation, as far as possible, in kind. Economic sustainability requires market proximity, sound natural resource management and including host communities as beneficiaries in the resettlement scheme. Development assistance, such as land preparation, credit facilities, training or job opportunities, may be provided.

53. New development strategies put forward for resettlement frequently emphasize both private and communal ownership of resources in rural communities in the developing world, as opposed to customary systems based on limited access to communal resources. A greater emphasis is also put on publicizing and

disseminating project objectives and related information through community outreach programmes, to ensure widespread acceptance and success of the resettlement and development process. Finally, the active participation of concerned communities in the decision-making process is of the utmost importance. Considerations when designing public participation programmes might include the need for long-term planning (typically 15 to 20 years, particularly in the case of large dam projects); adaptation of the programme to each stage of the project planning and implementation process; inclusion of both upstream and downstream communities; and accommodation of local capacities and customs. Properly designed and implemented public participation programmes can lead to the establishment of long-term partnerships between developers and concerned communities (see Chapter 3).

5.4.2 Non-monetary benefit-sharing mechanisms

54. Useful lessons can be drawn from all normative and policy frameworks described in the examples and from their implementation, though not all cases demonstrably resulted in positive outcomes in regards to compensation for involuntary displacement.

55. Only a few of the selected examples have undergone systematic post-project assessments of the compensation programmes implemented for communities affected by loss of assets or resources (the Laforge-1 and Sainte-Marguerite-3 Dams in Canada and the Maguga Dam in Swaziland). These assessments were carried out on the basis of surveys of local indigenous (that is, the Cree in the case of Laforge-1 and the Innu in the case of Sainte-Marguerite-3) and non-indigenous stakeholder representatives.

5.4.3 Monetary benefit-sharing mechanisms

56. Effective legislation on monetary benefit-sharing mechanisms such as revenue transfers or development funds, illustrated by the examples related to the

Brazilian legislation or the Lesotho Fund for Community Development, should generally include mechanisms that ensure that those affected by dams actually benefit from transfer payments.

57. Establishing partnership agreements between developers and local communities is probably the most innovative form of monetary benefit sharing. For the developer, a partnership provides an assurance of the local acceptance of the project, thereby reducing the level of risk and the cost of lengthy feasibility studies and authorization processes. For the local communities, it is recognition of their entitlement to a share of the economic rent generated by the dam and of their rights to have a say in the management of local water resources. Four hydropower projects in Hubei, China, two Canadian projects (Minashtuk and Touloustouc) and the Jondachi hydroelectric project in Ecuador illustrate this type of mechanism. One determining factor of success for partnership agreements is a long-term power purchase agreement.
58. Monetary benefit-sharing mechanisms are relatively new mechanisms. In most instances, the frameworks have been implemented recently and outcomes have been only partially evaluated. They would all benefit from further studies, including interviews with concerned stakeholders on the outcomes and results of the benefit-sharing mechanisms implemented in the context of each project.

5.5 Case studies

59. The selection of examples of compensation policy mechanisms focused on major international or national agencies that have financed the building of dams in developing countries over the last 20 to 30 years. Sources of information used to illustrate the implementation of selected normative and policy frameworks included a number of good practice reports produced on a preliminary basis in an ongoing

study on hydropower good practices by the International Energy Agency (IEA 2005). They also included an environmental and social database for eight dam projects derived from a study on quality management of safeguards in dam projects carried out for the World Bank in 2004 on the basis of consultations with a selection of stakeholders. In addition to these general sources of information, the consultants were able to access a number of socio-economic monitoring and follow-up reports based on previous field studies carried out on the Urrà-1 Dam in Colombia and on the La Grande hydroelectric complex and the Sainte-Marguerite-3 Dam in Quebec (Canada). However, a number of constraints, described in section 1.3, were encountered in the preparation of most examples.

60. The selection of examples for benefit-sharing mechanisms used as a starting point a study on benefit sharing from dam projects carried out in 2002 for the World Bank (Klimpt and others 2004). In addition, the search for potential sources of information included the following countries that have also adopted legislation on various types of benefit sharing: Japan, Nepal, Philippines and South Korea. The examples were also selected to cover all types of monetary benefit-sharing mechanisms. The same types of constraints referred to above were also encountered in the preparation of these examples.
91. The review of the literature and of examples of relevant practices resulted in the selection of a limited number of examples to illustrate the main characteristics of the issues under consideration. They are summarized in Annex II.
66. The reports of the consultants (Roquet 2006; Egré 2006) contain an extensive set of references, including Internet links, to the sources of information identified during the study of the issue. The report, which is open for review by the public, can be accessed in the DDP website at www.unep.org/dams/.

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6

Keiichi Shinoda/UNEP/Still Pictures

Environmental management plans

Summary

Environmental management plans are tools to ensure that environmental factors are carefully managed throughout the project cycle. This issue was selected, under the World Commission on Dams strategic priority related to sustaining rivers and livelihoods, for further study with a view to including it in the first edition of the Compendium (see Annex I).

The chapter discusses in detail different elements of environmental management plans and their relation to the different stages of project implementation, referencing some examples of practice. The concept and scope of environmental management plans have changed and expanded in recent years. International normative frameworks have evolved rapidly recently, in particular integrating a social and environmental systems approach since 1995. Some national frameworks have responded to these changes while others remain weak. Public regulatory and commercial environmental frameworks are converging. The World Commission on Dams knowledge base continues to be the most comprehensive review of the effectiveness of mitigation during implementation of dam projects.

This chapter identifies key factors contributing to the effectiveness of environmental management plans, including proponent and key partner commitment; participation of all stakeholders in plan development; ensuring comprehensiveness and quality; providing adequate lead time and support to develop appropriate institutional capacity for plan implementation; reinforcing the plan's formal status in project documents, agreements, permits and contracts; including full plan costs in project costs, economic and financial analyses, and budgets; systematic supervision and monitoring; and ensuring that plans are flexible and adaptive to be able to react to new situations.

It is concluded that there is a need to remove constraints affecting the preparation of environmental management plans during project planning; to increase access to plan documentation and to stakeholder evaluations of the effectiveness of project environmental and social management (except for resettlement, which has an extensive literature); to improve tools for the evaluation of such effectiveness; and to urgently promote the application of relevant practices in global regions where, at present, environmental and social practitioners are unable to identify examples of best practice.

6.1 Characterization of the issue

1. Environmental management plans are tools to ensure that environmental factors are carefully managed throughout the project cycle. They are intended to document the actions necessary to prevent or minimize predicted negative impacts, and to provide a framework for systematic management of environmental responsibilities, impacts and risks.

6.1.1 Environmental management plans and the project cycle

(a) Project cycle

2. The development and implementation of a major water resource project occurs in a number of iterative stages involving a large number of data-gathering, analytical, administrative and decision-making steps. The four main stages, which may overlap in time, are:

- **Planning and financing:** project concept, prefeasibility study, feasibility study including feasibility-level design and environmental and social assessment, approval, financing;
- **Design and pre-construction:** tender design and documentation, tendering and contract documentation, and pre-construction activities, including land acquisition and resettlement;
- **Construction:** construction design, construction, social and environmental management, commissioning;
- **Operation:** operation and maintenance, continuing social and environmental management as necessary;
- **Decommissioning** is also a major stage in the project cycle, but at present is seldom considered during the planning stage of large dam projects.

(b) Preparation of environmental management plans

3. Environmental management plans are normally prepared as a product of the impact assessment process during the project planning stage, and then continue to evolve in scope and depth with subsequent stages of project preparation and implementation. Impact assessment

and the preparation of an environmental impact statement⁴¹ generally occur at feasibility study stage in the project cycle, but this varies by jurisdiction.

4. The project proponent is normally responsible for preparation of the environmental management plan. As with other aspects of project planning and impact assessment, good practice requires the effective participation of stakeholders in plan development. This is particularly important where projects are large, complex and risky, and have significant social and environmental implications.
5. Environmental management plans are often incorporated into environmental permitting conditions and project financing agreements. Their use as regulatory and contractual documents increases the requirement that they are written clearly and with great attention to accuracy, detail and wording.

(c) Implementation of environmental management plans

6. The use of environmental management plans and their derivatives varies. At present, they are typically implemented during project construction and operation, but they may also be used during detailed design (to adjust the design and tender documents), tendering (to ensure that the selected contractor is socially and environmentally competent), pre-construction (for example to ensure that adequate pre-project baseline surveys are carried out or that land acquisition is implemented fairly), and decommissioning.
7. Responsibility for implementation of the environmental management plan will be described in the plan document itself. Overall responsibility rests with the project proponent (owner or operator), who will have legal responsibilities for performance under domestic legislation and, probably, additional contractual obligations with

41 Environmental impact statements take many forms and are commonly termed EIA reports or environmental and social impact assessment (ESIA) reports.

respect to the project financing agencies (and, increasingly, with affected people). Typically, large and complex projects necessitate the establishment of a specialized unit dedicated to management of the social and environmental issues.

8. Responsibility for physical implementation of the various measures described in the environmental management plan will vary according to the type and timing of the measure. For example, civil works contractors are often required to prepare and implement comprehensive environmental management plans during construction, utility operators are expected to develop and implement detailed operating rules for reservoirs, line agencies may undertake statutory monitoring activities, local governments may implement land use and zoning plans, and local and international NGOs may partner the proponent to assist in, for example, biodiversity conservation and community development in upper catchment areas.
9. A key process during environmental management plan implementation is monitoring and evaluation, checking that the measures described in the plan are being undertaken in the right place, at the right time, to the prescribed standard, and – importantly – that the measures are effective. In addition, an effective monitoring and evaluation system is alert to the unexpected issues and impacts that invariably arise during project implementation.

(d) Financing of environmental management plans

10. Environmental management plan costs vary enormously, reflecting their widely varying scale, scope and complexity. The basic cost categories are plan preparation and plan implementation. Implementation in turn has two major cost elements: programme implementation and administrative overheads. These elements cover many sub-elements, each of which may be a major programme in its own right, for example public participation, environmental flow determination, fisheries management, compensation

and resettlement, monitoring, or human resource development.

11. Environmental management plan implementation proceeds most smoothly when all costs have been identified in advance and are fully budgeted, and an adequate contingency allowed for the inevitable unforeseen tasks. Inadequate funding for environmental management plan preparation invariably results in inadequate funding for plan implementation, with unwelcome cost and budgetary surprises.
12. The increasing use of public-private partnerships for large water resource projects brings with it a tendency to divest environmental and social management tasks to the public sector partner (as these are usually considered a government responsibility), whilst the private sector partner focuses on building and operating the scheme. The attendant risk of underfinanced and unsynchronized social and environmental measures can be minimized by transparency during project planning and by paying close attention to the terms of the partnership.

6.1.2 Environmental management plan constituent elements

13. The issues traditionally addressed within environmental management plans are listed in Table 6.1. However, as described in section 6.2.3 and illustrated in Figure 6.1, the latest environmental management plans encompass a wide range of document types and can be broken down in many different ways. There is no standard format for these new types of plans, since the contents and level of detail need to fit the specific circumstances of the project. As environmental management plans evolve into environmental and social management programmes, which may include multiple policies, procedures, practices, management plans and actions, the nature and content of the documentation required will continue to change. However, a key criterion for a good environmental management plan is that it is easy to use and clearly linked to relevant items and schedules in the other project documents

including, for example, the construction contracts. Too often, provisions in different documents are inconsistent.

14. For the purposes of this review and characterization, the following nine topics may be considered as core elements of leading edge environmental management plans:
- Mitigation measures;
 - Environmental flows;
 - Catchment or basin management;
 - Social issues, including resettlement and community development;
 - Public involvement;
 - Institutional arrangements, including responsibilities, capacity issues, timing and costs;
 - Environmental management systems;
 - Monitoring and auditing;
 - Decommissioning⁴².

(a) Mitigation measures

15. Mitigation measures are actions intended to avoid, minimize or compensate for negative impacts that would occur in the absence of the measure. They may also include measures to restore damaged resources such as wetlands. Mitigation measures are the conceptual heart of project social and environmental management and, as such, are at the core of environmental management plans.

16. Mitigation measures may be broadly classed as structural or non-structural. Structural measures include changes to a project's location and to the design of engineered components (for example dam height or the incorporation of a fish pass). Non-structural measures encompass initiatives such as adjustments to reservoir operating rules, changes to the legal and institutional framework (for example creation of a basin management authority), power and water demand management, public awareness and training. Some mitigation measures incorporate both aspects, for example sediment control in headwaters (structural) combined with improved land use management (non-structural).

17. Environmental management plans normally include descriptions of each approved mitigation measure, together with a description of the impact to which it relates, the conditions under which it is required, and the details (or a reference to where the details will be documented) of how, when and by whom the measure will be implemented (including equipment and procedures used). Cost estimates and budgets for mitigation will preferably be included in the environmental management plan or referenced elsewhere in the project documentation. An example of the contents of an environmental management plan (in this case for a dam seismic upgrade project) is shown in Table 6.2.

Table 6.1 Issues typically addressed in traditional environmental management plans

- Impact summary, from the environmental impact assessment report;
- Description of mitigation measures, linked to the impact each measure relates to and the conditions under which it is required, and referenced to technical details such as methods, equipment and operating procedures;
- Public participation, including access to information and disclosure of project documentation;
- Institutional arrangements and responsibilities for implementation of each measure, including monitoring and supervision, the legal framework and capacity-building required for effective environmental management plan implementation;
- Monitoring programme;
- Reporting procedures, including mechanisms for evaluation and feedback;
- Timing of implementation schedule;
- Costs, including sources of funds.

⁴² Decommissioning as a core element of an environmental management plan is not usual practice; there is little advantage in developing a decommissioning plan half a century, least, before the event will happen. (Stakeholders from Industry Group)

Table 6.2 Example of contents of an environmental management plan focusing on a dam seismic upgrade project

<p>1. INTRODUCTION</p> <p>1.1 Project overview</p> <p>1.2 Project background</p> <p>1.3 Project description</p> <p>1.4 Purpose of the environmental management plan</p> <p>1.5 Environmental objectives and general site considerations</p> <p>1.6 Authorization process</p> <p>1.7 Environmental regulations</p> <p>2. ENVIRONMENTAL RESOURCE ASSESSMENT AND MANAGEMENT</p> <p>2.1 Drinking water supply</p> <p>2.2 Aquatic resources</p> <p>2.3 Vegetation</p> <p>2.4 Wildlife habitat</p> <p>2.5 Recreation/visual</p> <p>2.6 Heritage or archaeological sites</p> <p>2.7 Community resources and consultation</p> <p>3. CONSTRUCTION IMPACTS AND ENVIRONMENTAL MANAGEMENT</p> <p>3.1 General</p> <p>3.2 Contractor's site environmental protection plan</p> <p>3.3 Access development</p> <p>3.4 Sedimentation and water handling</p>	<p>3.5 Erosion control</p> <p>3.6 Oil and fuel</p> <p>3.7 Vegetation removal</p> <p>3.8 Concrete and grouting</p> <p>3.9 Acid rock drainage</p> <p>3.10 Explosives and blasting</p> <p>3.11 Waste management</p> <p>3.12 Sewage and refuse disposal</p> <p>3.13 Hydrology</p> <p>3.14 Site restoration and deactivation</p> <p>4. ENVIRONMENTAL MONITORING</p> <p>5. SCHEDULE</p> <p>6. ORGANIZATION AND AGENCY CONTACT LIST</p> <p>LIST OF APPENDICES</p> <p>1. Draft plan view and section of the embankment and construction area overview drawing</p> <p>2. Fish habitat compensation plan</p> <p>3. Basin regulations</p> <p>4. Procedures for importing fill material into catchment areas</p> <p>5. References for the regional district management plan and the water district catchment lease</p> <p>6. Instream work – pump around diagram</p> <p>7. Spill response plan</p>
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Source: Adapted from BC Hydro Engineering 2005.

(b) Environmental flows

18. An environmental flow is “an allocation of water with a prescribed distribution in space and time, and of a specific quality, that is deliberately left in a river, or released into it, to manage river health and the integrity of ecosystems and communities sustained by river flows” (Watson, 2006). Environmental flows provide critical contributions to river health, economic development and poverty alleviation, and ensure the continued availability of the many benefits that healthy river and groundwater systems bring to society (Dyson, Bergkamp and Scanlon 2003). Environmental flow requirements usually cover three major hydrological variables: water quality, minimum flows and managed flood releases. Many countries now have policies that recognize the need for environmental flows.
19. Environmental management plans normally cover environmental flows (also termed “in-stream flow requirements”) during both project construction (when flows may be diverted) and project operation. In storage

schemes, their requirements are balanced with sound reservoir operating rules.

20. Environmental flows are increasingly being applied retroactively: many existing dams can be managed differently to provide or restore downstream ecosystem and economic benefits, while not jeopardizing their original function of power generation or water storage and supply. An example from Africa is given in Box 6.1.

Box 6.1 Itzhi-Tezhi Dam, Zambia

The Itzhi-Tezhi Dam on Zambia's Kafue River provides partial river regulation for the 900-megawatt Kafue Gorge hydropower plant. The dam was completed in 1977 with an additional storage volume of nearly 20% to allow managed flood releases to simulate natural cycles in the Kafue Flats, a wetland area of exceptional conservation and socio-economic importance at the heart of Zambia's agricultural and industrial zone. To develop and implement the third iteration of the dam's operating rules and thereby increase the benefits from managed flood releases, a partnership was formed between the owner and operator, the regulator and an international NGO. The partnership successfully developed new rules that mimic natural cycles better while not affecting power generation. Steps are now being taken to facilitate physical implementation of the new rules.

(c) Catchment or basin management

21. Water infrastructure is highly dependent on the natural and social conditions of the catchment supplying the water. Increasingly, this direct connection is being recognized in practical terms by formally linking water resource schemes with management and development activities in the contributing headwater areas. At the same time, these activities are increasingly being undertaken within the framework of market-based mechanisms for catchment protection and the capture of value from ecosystem services such as the provision of water (FAO 2003; Geoghegan 2005). Six factors or themes can be identified as contributors to this process:

- Poor catchment condition, which can dramatically reduce project life, due to siltation;
- The rights of basin residents, which are becoming better recognized;
- Participatory project planning processes, which are becoming more common and more effective, so that residents of affected areas are in a better position to demand and achieve benefits, often in the form of community development schemes;
- The regional effects of major water infrastructure schemes, which can be catalysts for regional economic and social development and for watershed protection. A well-known example dating from the 1930s is the Tennessee Valley Authority in the United States;
- Efforts to reverse environmental degradation at river basin level, which are becoming more common, for example in Tanzania's Pangani River basin (IUCN 2003);
- Climate change, which is both changing the parameters upon which many existing projects were designed and increasing uncertainty for new projects.

22. Environmental management plans, as high-level planning and management documents, can encompass and refer to activities undertaken in catchment areas (Box 6.2).

Box 6.2 Berg water project, South Africa

The Berg water project is a water supply project for the heavily urbanized Western Cape region. It relies on the capture of winter flows in a large storage reservoir for release during the dry summer months. Water yield from the catchment has been reduced by invading alien species, which have also displaced unique endemic vegetation. As part of a national programme aimed at enhancing water security, improving ecological integrity, restoring land and promoting sustainable resource use, the project owner has partnered with the national Department of Water Affairs and Forestry to provide employment for local residents by clearing the dam's catchment of alien trees and shrubs.

(d) Social issues

23. As noted in Figure 6.1, under some approaches environmental management plans have evolved from tools related only to dealing with direct biophysical impacts to encompass all project social and environmental impacts and activities. As such, they may cover the full range of social issues, from displacement and resettlement through cultural heritage, employment, health and safety, public consultation and disclosure, to social and economic development.⁴³ These issues are normally documented through stand-alone reports and plans commensurate with the complexity and regulatory framework of the issue concerned, but they can also be linked back to overall environmental management plans (or social and environmental management plans or other high-level compliance and management frameworks for quality management purposes). Social impact assessment and compliance, and associated tools and mechanisms, are discussed in Chapters 4

⁴³ The International Organization for Standardization (ISO) is preparing a standard on social responsibility (ISO 26000) with a target date for publication of October 2008. This guidance document will assist organizations with planning and managing social issues but is not intended to be a specification suitable for third party certification.

and 7 respectively, with further details in the corresponding consultants' reports (Heinsohn 2006; Bruch 2006).

24. Of the many social issues that usually arise from large water infrastructure projects, two are highlighted here in relation to environmental management plans, due to the importance of the underlying principles and the increasingly integrated nature of project impact management documentation: resettlement and community development.

25. **Resettlement** is a complex and challenging process governed by an extensive set of international norms and by domestic legislation. The contents of a typical international financial institution resettlement action plan are listed in Table 6.3. Note that the list specifies an "income restoration strategy". Worldwide experience demonstrates that resettlement programmes with a "living standards restoration" approach are "almost guaranteed to leave a majority of the resettlers worse off" (Scudder 2005). Best practice requires that the task of resettlement is elaborated as a development programme in its own right, but this approach has yet to be incorporated into a significant number of normative frameworks. An example of practical action to fill some of the gaps between international standards and traditional practice is given in Box 6.3.

Box 6.3 New Naga Hammadi Barrage and hydropower plant, Egypt

The new Naga Hammadi Barrage is a replacement for the original barrage completed in 1930 across the River Nile in Upper Egypt. The barrage incorporates a 64-megawatt low-head hydropower station and will maintain continuity of irrigation supplies to both banks of the river. Construction of the new barrage necessitated both permanent and temporary land acquisition. Gaps between traditional compensation and resettlement practice and financing agency requirements were identified in the environmental impact assessment and overcome by adjusting the implementation of domestic law and by applying additional measures. Of these, the two most important were the valuation of assets at local market values, and the payment of compensation before the start of construction. Further social mitigation actions focus on support for sharecroppers, landless labourers and fishers, and on public health.

Table 6.3 Typical contents of international funding agency resettlement action plan

- Scope of land acquisition and resettlement;
- Socioeconomic information;
- Objectives, policy framework, and entitlements;
- Consultation, participation, and grievance redress;
- Relocation of housing and settlements;
- Income restoration strategy;
- Institutional framework;
- Resettlement budget and financing;
- Implementation schedule;
- Monitoring and evaluation.

Source: ADB 1998.

26. Resettlement is an activity that may be carried out by government or by the project proponent, directly or through subcontractors. In almost all cases, many agencies and partners are involved. In many cases, the resettlement documentation is linked back to the project's overall social and environmental management plan or compliance plan to allow transparent monitoring of the progress of implementation, its effectiveness, and its compliance with legal and regulatory requirements (see also Chapter 4).

27. **Community development** is highlighted since this reflects the current status of the management of social issues in major infrastructure projects. Public acceptance of major projects now demands more than temporary benefits, such as local employment quotas. Instead, or rather in addition, project proponents are often expected to establish programmes to give lasting benefits to local communities. This may be done in various ways, ranging from the provision of small-scale infrastructure (water supplies, meeting halls), through livelihood activities such as skills training, to long-term agreements for revenue sharing. An interesting example of a long-term agreement of revenue sharing is Canada's Columbia Basin Trust, which under the terms of the original legislation received 50% of the net profits from power projects in the basin. This income is spent by the trust on social, economic and environmental benefits for basin residents. Chapter 5 describes benefit-sharing mechanisms, with full details in the corresponding consultant's report (Egré 2006).

(e) Public involvement

28. Public involvement is intrinsic to the development of achievable mitigation measures. Lack of public participation in the preparation of environmental management plans results in a lack of public acceptance of the resulting programme, and may cause key issues to be overlooked, with subsequent negative impacts on project performance. One method of achieving an acceptable outcome is to establish a multistakeholder committee to oversee preparation of the environmental management plan. Where environmental management plans are prepared by consultants, it is important that the terms of reference include formal requirements for public participation (including the necessary authority to act on the proponent's behalf). An example of successful public involvement in project planning in South America is given in Box 6.4.

Box 6.4 Salto Caxias hydroelectric power plant, Brazil

The 1,240-megawatt Salto Caxias hydroelectric project is the lowest in a cascade of five hydropower plants on the Iguazu River. It involves a 67-metre-high dam and a reservoir of some 144 square kilometres. When announced in the 1980s, the project faced considerable resistance due to Brazil's history of insensitive military governments and local experience of unmitigated impacts from the four previous dams. The situation was resolved through the establishment of a multidisciplinary study group including representatives of the owner, the regulator, the affected population, scientific and research organizations, and social and environmental NGOs. Through a long series of open meetings the group built up sufficient trust and understanding to be able to develop mutually acceptable solutions to the project's wide range of social and environmental impacts, including a large development-orientated resettlement programme.

29. The public may be involved in environmental management plan implementation as beneficiaries, as managers (for example on stakeholder management committees, if these have been set up) and as monitors, through participatory monitoring methods (for example for freshwater artisanal fishing). Public trust in project management is greatly enhanced when the results

of monitoring are made public, on an ongoing basis, and if they are obtained by independent organizations rather than directly by the proponent.

30. At all times it is important that projects have clear channels for communication with local residents and the public in general (for example through the media or politicians), and a clear complaints systems through which complaints can be received, recorded, analysed and resolved. The nature and mechanisms of stakeholder participation are reviewed in Chapter 4 and the corresponding consultant's report (IAP2 2006).

(f) Institutional arrangements

31. A central purpose of environmental management plans is to clarify responsibility for the activities that have to be undertaken. Environmental management plans typically detail:

- The legal framework;
- The responsibilities for implementing specific measures, whether these are further high-level programmes such as a resettlement action plan or detailed activities such as installation of wastewater treatment systems during construction;
- Organizational relationships.

32. Environmental and social management invariably involves many government departments and agencies due to their statutory responsibilities, together with the private, public or parastatal organizations and NGOs that may be involved in the implementation of each measure. Governments are not immune from institutional conflicts, characterized by institutional territoriality and information hoarding. Overlapping mandates are common, especially for environmental issues and natural resource management. Acknowledgement of these constraints during the preparation of the environmental management plan will assist in establishing a clear set of links, responsibilities and reporting pathways. The time and resources required to do this may be greater than envisaged. An

Box 6.5 Arrow Lakes generating station, Canada

The Arrow Lakes project involved the addition of a 185-megawatt power plant to an existing 52-metre-high dam built for river regulation on the Columbia River in Canada. The project was in an environmentally and socially sensitive area, and subject to tight controls through both the provincial and federal administrations. To clarify responsibilities, a plan entitled Owner's Commitments, Responsibilities and Assurances was prepared to cover power plant construction, power plant operation and transmission line construction and operation. The plan laid out the various commitments and assurances made by the proponent as part of the project planning and permitting process, together with detailed responsibilities by party (owner, owner's consultants and the design-build contractor).

example of a plan detailing the proponent's responsibilities during project construction and operation is given in Box 6.5.

33. In many countries, the institutional framework for project environmental and social management is weak or fragmented. The environmental management plan clarifies and defines any institutional changes, capacity-building and training required to implement the plan effectively, together with the necessary time lines, responsibilities and resources.
34. Environmental management plans are normally developed in outline during feasibility studies and in more detail following project approval, that is, during the tender design and pre-construction phase.⁴⁴ They contain measures to be undertaken at specific project stages (design, construction and operation) and, at a greater level of detail, under certain conditions or with certain frequencies, for example specifying the frequency of water quality monitoring or compliance auditing. It is important that the timing of all measures is clearly stated in environmental management plan documentation.
35. Environmental management plans have associated costs. The cost of each measure is estimated and included in the overall plan budget, together with the source of

⁴⁴ The normative frameworks of most international funding agencies require full environmental management plans as a product of the environmental impact assessment process. In the consultant's experience this seldom occurs due to resource constraints (Ramsay 2006). The resulting environmental management plans are in effect outlines, requiring considerable further development in subsequent project planning stages.

financing.

(g) Environmental management systems

36. Environmental management systems are procedures that systematize an organization's activities with the aim of improving organizational environmental performance. They are focused on internal management and are most easily applied to repetitive tasks that can be turned into controlled procedures. They are usually implemented voluntarily.
37. Environmental management system approaches and terminology are largely standardized, the two main normative frameworks being the International Organization for Standardization, through the ISO 14000 family of standards on environmental management, and the European Union's Eco-Management and Audit Scheme. Both systems are subject to certification through independent external audits, but whereas adoption of an ISO 14001 environmental management system is voluntary, application of the Eco-Management and Audit Scheme can be required by European Union regulations. Environmental management systems are governed internationally and have a consistent terminology and approach, in contrast with environmental impact assessment, which is often regulated locally and has developed numerous variants. Typical components of an environmental management system are listed in Table 6.4.
38. The importance of environmental management systems for environmental management plan implementation is that they facilitate systematic management of activities and tasks by project owners, builders and operators. They are most effective where these organizations already

Table 6.4 Typical components of an environmental management system

<ul style="list-style-type: none"> • Management commitment; • Environmental policy; • Environmental aspects and impacts; • Objectives and targets; • Roles and responsibilities; • Planning and programmes; 	<ul style="list-style-type: none"> • Regulatory compliance; • Document control; • Operational and emergency procedures; • Training; • Monitoring and measuring; • Review (including environmental audits) and improvement.
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Source: IHA 2004.

use an environmental management system framework for their day-to-day business. An example of early adoption of an environmental management system by a power and water utility is given in Box 6.6.

build, own, operate and transfer), which introduce contractors earlier into the project cycle, and also because of the increasing importance of environmental certification for corporate reputation and commercial viability.

39. Transfer of environmental impact assessment requirements and other commitments in the project documentation to an environmental management system can be done by identifying all required tasks and standards and creating a database or register of commitments. In environmental management system terminology, such a register becomes an “environmental management programme” (ISO 14001:2004, Clause 4.3.3) (ISO 2004). The commitments can be classified as design commitments, management commitments and monitoring commitments (Ridgway 2005). They can be actioned through the development of operational control procedures, and checked through building auditing and reporting requirements into the project’s internal management systems.

(h) Monitoring and auditing

41. One major purpose of an environmental management plan is to define a project’s environmental (and social) monitoring programme. Environmental and social performance monitoring is necessary both to check compliance with agreed commitments and standards and to monitor the effects of the project in case of any need for remedial action by project management.

40. Environmental management systems are becoming increasingly important for environmental management plan implementation as a result of the increasing popularity of alternative project delivery strategies (such as design and build; and

42. Compliance monitoring procedures may be laid out in a high-level compliance plan, as recommended by the World Commission on Dams (WCD 2000). At lower levels, such as on site, similar plans assess compliance with permitted standards such as water and air quality. Compliance mechanisms and approaches are discussed in Chapter 7 and the corresponding consultant’s report (Bruch 2006).

43. Monitoring programmes normally describe the ecosystem (or social system) component at risk, with a link to the impact predicted in the environmental impact assessment, and define the

Box 6.6 ACTEW, Australia

The ACT Electricity and Water Corporation Limited (ACTEW) provided electricity, water and sewerage services to Australia’s Capital Territory, including the management of four large dams and their reservoirs.⁴⁵ The corporation was required by legislation to conduct its operations in accordance with the principles of environmentally sustainable development. Following the preparation of an environmental management plan for the period 1995–2000, the corporation established an environmental management system to implement both the environmental management plan and its annual environmental action plans. Three ACTEW facilities were amongst the first sites to be ISO 14001 certified in Australia. Because of its reputation for an excellent environmental management system, the corporation has gained considerable overseas work, in addition to improved customer satisfaction, more efficient operations and significantly reduced levels of risk.

45 These services, together with gas and telecommunications, are now provided by ActewAGL, a joint venture of ACTEW Corporation Ltd and The Australian Light and Gas Company (AGL).

Box 6.7 King River power development, Australia

The King River project involved two large dams on the King River in Tasmania, creating a reservoir of 1,065 million cubic metres supplying a 143-megawatt power station. Construction was completed in 1993. Water quality was a major issue due to a long history of mining in the catchment, resulting in acid mine drainage and heavy metal contamination. The owner wished to establish a recreational fishery in the lake and therefore implemented an extensive water quality monitoring programme to measure ongoing changes in the reservoir and to check the effectiveness of mitigation measures upstream. The programme also identified an issue with deoxygenation in the tail race water due to thermal stratification in the reservoir, a problem solved by installing a jet pump on the turbine to provide aeration.

indicators to be measured, the methods to be used, the sampling frequency, threshold levels that will trigger management action and reporting systems. An example of a water quality monitoring programme is given in Box 6.7.

44. Auditing is a specialized monitoring procedure that systematically checks an organization's compliance with specific requirements, such as operational procedures and standards. Audits are an essential component of quality assurance systems, including formal environmental management systems. Internal audits check on performance and compliance. Periodic independent audits are required to obtain and maintain environmental management system certification.

(i) Decommissioning

45. Decommissioning is included as a constituent element of environmental management plans as it is an increasingly necessary component of water resource project management. Decommissioning will eventually be needed for virtually all major structures on rivers, but with widely varying timescales.
46. Decommissioning is a highly technical exercise requiring great care and appropriate environmental permitting and management, through an environmental management plan.

6.2 Environmental management plans: Current status in frameworks and in implementation

47. The following discussion is based on the review of the issue and the examples of implementation identified during

investigation of background information. Table 6.5 lists the case studies selected to illustrate implementation of the issue and its main elements.

6.2.1 Environmental management plan normative frameworks

48. In most jurisdictions, environmental management plans are standard products of the impact assessment process, and as such are governed by environmental impact assessment normative frameworks at national level, and at provincial or state level in federal countries. Environmental management plan requirements may be formulated in framework environmental protection laws, in specific impact assessment laws, in regulations or in formal guidelines. In some cases, environmental management plans are specified, together with their contents and format; in other cases, they are required only by implication or as a matter of best practice.
49. Environmental management plans are often tied in with land use planning and development control legislation, and at lower levels of government, local authorities may mandate environmental management plans as part of the development permitting process.
50. Internationally, the main categories of organizations with normative frameworks covering environmental management plans, directly or indirectly, are the multilateral development and financing organizations, bilateral aid and export credit agencies, commercial banks, and a wide range of interest groups ranging from industry associations through to NGOs. In general, international organizations are advanced with respect to incorporating

Table 6.5 Main elements of environmental management plans addressed by the selected case studies⁴⁶

Dam/project	Mitigation measures	Environmental flows	Catchment/ basin management	Social issues	Resettlement	Community development	Public involvement	Institutional arrangements	Environmental management system	Monitoring and auditing	Decommissioning
ACTEW environmental management system		Regulated minimum flows						Clear structures and responsibilities	Site-based and corporate environmental management system for utility operation	Internal, and external for certification	
Arrow Lakes generating station	Environmental and social	Reduced total gas pressure and thermal effects		Full range considered and mitigated		Proactive programme	Full involvement at all stages	Clear structures and responsibilities	Post-construction corporate environmental management system	Extensive monitoring programmes and open reporting	
Berg water supply	Environmental and social	Extensive modelling	Development plan, vegetation management, local employment	Full range considered and mitigated		Programme for local communities	Increasingly active civil society	Clear structures, evolving with time		Extensive monitoring programmes	
Coursier Dam decommissioning	Mostly environmental			First Nations consultation and measures			Full involvement at all stages	Clear organization and schedule		Comprehensive monitoring programmes	Safety-driven decommissioning
Itezhi-Itezhi Dam flood releases		Improved operating rules to give higher environmental flow benefits		Re-establishment of wetland resource-based livelihoods			International NGO a major player; local dialogue; links to development programmes	Tripartite agreement: owner, regulator, NGO			
King River power project	Mostly environmental	Post-construction environmental flow programming	Extensive measures to protect water quality from heavy metals	Some social measures			Increasing formal public involvement	Environmental committee during construction	Post-construction corporate and regional environmental management system	Extensive water quality monitoring programmes	
Kukule Ganga hydropower		Mandatory minimum release			Some families resettled; grievance system		Involvement of NGOs at planning stage	Environmental monitoring committee, post-construction corporate environmental unit	Contractor environmental management system for construction; post-construction owner environmental management system	Some monitoring, mostly environmental	
National Water Fund			Watershed protection to safeguard urban water supplies	Response to social pressures on key watersheds			Broad-based consultation to initiate scheme	Fee-based endowment fund for watershed protection			
New Naga Hammadi Barrage	Environmental and social		Major structural mitigation measures to protect soils, agriculture and public health	Improved practices and measures to fill gaps between local and international norms		Support for local NGO	Consultation uses existing social structures and systems	Environmental unit utilizing engineering and research institute staff; in-service training	Construction environmental management based on environmental management system	Extensive monitoring programme, especially groundwater; use of GIS	
Salto Caxias hydropower	Environmental and social	During reservoir filling	Major social programmes	Major development-orientated agricultural resettlement programme		Local and regional development initiatives	Multi-disciplinary study group, open meetings	Clear organization and responsibilities	Post-construction corporate environmental management system	Extensive monitoring programmes with independent verification	

⁴⁶ This table illustrates the main elements of environmental management plans addressed by the selected examples. The main elements considered reflect those identified in the characterization of the issue. For more detail, see the case studies in the final report on the issue (Ramsay 2006). The blue boxes indicate use of the element, and the green boxes indicate that the consultant considers the example to be particularly informative.

latest environmental management plan concepts into policies, regulations and procedures.

51. Organizations that implement environmental management systems may also require environmental management plan-type documentation (for example an environmental management programme as per ISO 14001:2004, Clause 4.3.3).
52. Depending on one's perceptions, the leading edge of environmental management plan practice could be regarded as somewhere between the recommendations of the World Commission on Dam on mitigation, resettlement and development action plans and the International Finance Corporation's new social and environmental assessment and management systems (WCD 2000; IFC 2006a, 2006b). This spectrum is reflected in the private finance sector, where many commercial banks voluntarily subscribe to the revised Equator Principles (Equator Principles Secretariat 2006), which are based on the International Finance Corporation's environmental and social standards. One of the major players, HSBC Group, however, has committed to following the World Commission on Dams framework for decision-making in its Freshwater Infrastructure Guideline (HSBC 2006).

6.2.2 Implementation

53. The concept of environmental management plans emerged from the field of environmental impact assessment. Following the prediction of potential impacts and an evaluation of their significance, the next step in the impact assessment process is the development of mitigation measures to prevent, minimize or offset significant adverse impacts. For projects that proceed, these measures, together with any approved enhancement measures,⁴⁷ are then formally integrated

into the project design (in impact assessment theory, this integrating step is considered part of the environmental impact assessment follow-up process) (Marshall 2004).

54. The document that clearly describes the mitigation measures to be incorporated into further stages of project design, implementation and operation, and how this will be done, is termed an environmental management plan. Environmental management plans provide an essential link between the impacts predicted and mitigation measures specified within an impact assessment report and final design, implementation and operational activities. Environmental management plans may be given legal status by being referred to or incorporated into environmental permits, financing agreements and other contractual documents.

6.2.3 Evolving scope of environmental management plans

55. The scope of environmental management plans has changed over time, reflecting the evolution of the impact assessment process (Figure 6.1). Five broad stages can be determined:

(a) Stage 1

56. Initially, impact assessment focused on environmental impact assessment, limiting its consideration to the potential impacts of proposed projects on important elements of the biophysical environment.⁴⁸ Environmental management plans were, therefore, similarly limited, dealing with the implementation of mitigation measures for biophysical impacts (on air, water, soil, wildlife) and with monitoring. This early type of plan tended to focus on the direct impacts of projects and on the construction phase. In a few jurisdictions, the plans remain limited to this scope.

47 Enhancement measure: Additional activity not strictly part of the main project but which would give significant environmental or social benefits at low cost.

48 Sometimes termed valued ecosystem components (VECs).

(b) Stage 2

57. Subsequently, social impact assessment evolved into a mainstream impact assessment topic, partly to cover the critical issue of involuntary resettlement.⁴⁹ This resulted in the emergence of socially related plans, such as resettlement action plans and indigenous peoples development plans (IFC 2003). In accordance with this approach, large projects financed by multilateral funding agencies could be required to develop an environmental management plan covering biophysical mitigation and monitoring and some social issues, a resettlement action plan covering compensation and resettlement, and a separate indigenous peoples development plan covering specific actions needed to support indigenous people.

(c) Stage 3

58. The picture changed again as a result of (a) widespread recognition that separation of environmental impact assessment and social impact assessment denies the reality in many large dam projects of the indivisible links between natural resources and rural livelihoods; and (b) reconsideration of impact mitigation as a planning principle. Simple mitigation is now widely regarded as an inadequate approach to sustainability. It is being complemented or replaced by a proactive development-type approach to maximize the developmental benefits of projects and to ensure equitable outcomes for all stakeholders and affected parties. Combined with the need to avoid further fragmentation of impact assessment reporting and to simplify project management, this led to the development of integrated impact assessment procedures and the production of integrated environmental and social management plans, for example the International

49 Both of the two major impact assessment streams (environmental and social) have developed specialized methodologies for specific topics such as biodiversity impact assessment and health impact assessment. The profession continues to evolve as it matures, extending into new fields such as sustainability, human rights and risk assessment.

Finance Corporation's environmental and social action plans (IFC 2003).

59. Under this approach what was once a relatively straightforward biophysical environmental management plan has become a much more complex product, potentially including substantive stand-alone subplans such as basin management plans, integrated water resource management plans, resettlement action plans, community development plans and cultural heritage management plans. In turn, these can include descriptions of further specialized programmes such as environmental flow plans, participation or public consultation and disclosure plans, gender action plans and environmentally friendly procurement plans.⁵⁰ The mitigation, resettlement and development action plans recommended by the World Commission on Dams fall within this group, in this case with an emphasis on formalizing the obligations and entitlements of stakeholders in accordance with a rights and risks approach (WCD 2000).

(d) Stage 4

60. The latest theme to emerge is the integration of environmental management plans into quality assurance and quality control systems, in particular environmental management systems based on the ISO 14000 series of international standards (ISO 2002). Environmental management systems have evolved in parallel with environmental management plans over the last decade and now appear set to take over or absorb many of the functions of environmental management plans.

61. The three major themes noted above – integrated impact assessment, environmental management plans and environmental management systems – have been combined in the latest safeguards terminology from the World Bank Group.

50 Procurement plan: Procedure to ensure that all goods and services procured for the project comply with environmentally responsible principles, for example certification of timber.

Figure 6.1 Evolving scope of environmental management plans (generalized)

Stage and approximate date	Impact Assessment (typical practice)	Environmental Management Plan (typical documentation)		
1. 1980 +	EIA	environmental management plan (biophysical) (direct impact)		
2. 1990 +	EIA+SIA	environmental management plan (biophysical + social) (direct + indirect impacts)	+ resettlement action plan	+ indigenous peoples development plan
3. 1995 +	Integrated ESIA	environmental & social action plan (high-level)	+ subplans: EMP, monitoring plan, RAP, community development plan, consultation plan, emergency response plan, reservoir operating rules, etc	
4. 2000 +	ESIA + EMS	action plan (high level) + social and environmental management system (internal/operational)	+ subplans: numerous plans for many topics at different administrative levels and project stages plans designed to enable quality control throughout project cycle	
5. Future	Sustainability assessment as framework?			

Key: EIA Environmental impact assessment
 EMP Environmental management plan
 EMS Environmental management system
 ESIA Environmental and social impact assessment
 RAP Resettlement action plan
 SIA Social impact assessment

The International Finance Corporation's new Performance Standard 1: Social and Environmental Assessment and Management Systems states (IFC 2006a):

"Social and Environmental Management System: The client will establish and maintain a Social and Environmental Management System appropriate to the nature and scale of the project and commensurate with the level of social and environmental risks and impacts. The Management System will incorporate the following elements: (i) Social and Environmental Assessment; (ii) management program; (iii) organizational capacity; (iv) training; (v) community engagement; (vi) monitoring; and (vii) reporting."

(e) Stage 5

62. Further evolution of the project management process for water resource projects is likely to include sustainability as the overarching principle, with mechanisms including sustainability assessment. Useful approaches and tools are given in the

International Hydropower Association's sustainability guidelines (IHA 2004).

6.3 Conclusions and recommendations

63. Four major findings emerge from the research carried out for this report on environmental management plans:

- The concept and scope of environmental management plans have changed and expanded in recent years. The original concept of an environmental management plan as a document to define mitigation and monitoring measures during project implementation has changed dramatically, in step with the continuing evolution of impact assessment methodology. The environmental management plan concept has expanded to cover the entire range of project environmental and social management activities in their widest sense and application. The new role of environmental management



Mark Edwards/Still Pictures

plans is likely to be superseded by the increasing importance of environmental management systems, which may eventually become the natural operational successor to environmental impact assessment reports within the project cycle, absorbing environmental management plans.

- Normative frameworks for environmental management plans vary widely. International normative frameworks for environmental management plans have evolved rapidly since about 1995 and especially since 2000, incorporating first, an integrated environmental-social approach; second, a rights and risks approach (WCD 2000); and third, a systems approach to environmental and social management throughout the project cycle. Some national normative frameworks have responded to these changes, with detailed requirements for environmental management plan preparation,

implementation and monitoring. Other national frameworks still do not capture environmental management plans based on clear principles and specific regulations.

- Public regulatory and commercial environmental management frameworks are converging. The increasing use of standardized environmental management systems by the private sector is being matched by increasing use of management system concepts in normative frameworks, especially those applied by major multilateral funding agencies and leading commercial banks. This convergence has yet to be recognized on any wide scale in national and subnational legislative and regulatory frameworks.
- The World Commission on Dams is an important information base. There is very little evaluative material on environmental management plans available on the Internet (with the exception of the specific topic of involuntary resettlement). As yet there are few examples of the latest approaches being carried all the way through to project operation, especially in developing countries.⁵¹ The most comprehensive review of the effectiveness of mitigation during implementation of dam projects remains that of the World Commission on Dams.

64. Based on this review, key factors in the effectiveness of environmental management plans include:

- Proponent and key partner commitment;
- Participation of all stakeholders in environmental management plan development;
- Ensuring comprehensiveness and quality;
- Providing adequate lead time and support to develop appropriate institutional capacity for environmental management plan implementation;
- Reinforcing the formal status of

⁵¹ For example, in relation to WCD-compatible projects: "To this date, such a project does not exist" (Schneider 2006).

- environmental management plans in project documents, agreements, permits and contracts;
- Including full environmental management plan costs in project costs, economic and financial analyses, and budgets;
 - Systematic supervision and monitoring, requiring the design, funding and implementation of rigorous supervision programmes to check on environmental management plan implementation and effectiveness, and to advise on corrective actions required (in multilateral development bank terminology: “environmental performance monitoring and supervision”);
 - Ensuring that environmental management plans are flexible and adaptive to be able to react to new situations and to anticipate changes.
65. Recommendations arising from this review include:
- Loosening of resource constraints affecting the preparation of comprehensive environmental management plans as a necessary component of environmental impact assessment reports will allow their implementation to commence as early as during the pre-construction phase;
 - Access to environmental management plan documentation can be improved by creating an Internet-accessible reference library of project-specific environmental management plan reports;
 - Benefits would arise from improved access to stakeholder evaluations of the effectiveness of project environmental and social management (except for resettlement, which has an extensive literature);
- Tools for the evaluation of environmental and social management effectiveness for water resource projects can be improved (a useful example might be the work of the Management Effectiveness Task Force of IUCN’s World Commission on Protected Areas);
 - There is an urgent need to promote the application of relevant practices in global regions where, at present, environmental and social practitioners are unable to identify examples of best practice.

6.4 Case studies

66. Additional information and detailed description of the examples mentioned in this chapter can be found in the report of the consultant (Ramsay 2006). The report examines the issue of environmental management plans throughout the project life cycle, including planning, construction, operation and decommissioning. The case studies were drawn from both developed and developing economies and illustrate relevant practice in real-life situations. The applicable elements and outcomes of each project’s environmental management plan are summarized and conclusions given (Annex II).
67. The consultant’s report (Ramsay 2006) contains an extensive set of references, including Internet links to the sources of information identified during the study of the issue. The report, which is open for review by the public, can be accessed in the DDP website at www.unep.org/dams/

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UNEP/Still Pictures

Compliance

Summary

The World Commission on Dams highlighted the fact that compliance remains a significant challenge for many dams. This chapter explores the compliance issue through consideration of a variety of mechanisms or approaches to ensure that a dam project follows all the requirements and procedures at every stage. They necessarily involve a mix of regulatory and non-regulatory measures to encourage, facilitate and compel compliance. The issue was selected for inclusion in the Compendium on the basis of the recommendations of the fourth meeting of the Dams and Development Forum (see Annex I).

The review involved a variety of instruments grouped under the categories of incentives, facilitative approaches and approaches to compel compliance. In addition to the regulatory framework, it is important to have in place an effective system of incentives and disincentives; monitoring and auditing, including by independent third parties; public participation, transparency, and accountability; independent means for resolving disputes, protecting rights, and enforcing responsibilities; and not least, institutional and human capacity, political will and addressing corruption.

The review of the literature indicates that incentives are encouraged as a means of providing industry with more flexibility in achieving social and environmental goals, but they have yet to be applied extensively or fully effectively to dams. Performance bonds and other financial assurances are widely used in the mining sector in some countries and could be used to promote compliance with environmental and social requirements in the context of dams. Facilitative measures can be important in promoting compliance; these include internal approaches (capacity-building of the various actors, compliance plan or environmental management plan, self-monitoring, appointment of an in-house compliance officer, following a code of conduct or entering into an integrity pact, or adoption of an environmental management system) and external approaches (independent compliance monitoring by NGOs, sometimes by a panel of experts, good neighbour agreements and similar pacts, transparency and access to information, and meaningful public participation and consultation). Such mechanisms may require more trust and some remain underutilized. Three facilitative approaches that are emerging in the context of dams are the use of trust funds, participatory processes and inclusion of detailed terms and adaptive management in a licence or contract.

If the various incentives and facilitative mechanisms are not effective, national and international bodies can review non-compliance, resolve disputes, and (to varying degrees) apply sanctions for non-compliance. These include, for example,

inspection panels, ombudspersons, panels of experts, and compliance advisers in various multilateral development banks; independent mediation and arbitration; national courts; and in rare instances international courts. Disincentives and deterrents can help to compel compliance, especially when there is a credible threat that non-compliance will be caught and punished.

The last decade has seen dramatic strides in measures to encourage, facilitate and compel dam owners and authorities to comply with laws, policies and other relevant norms. While much remains to be done, there are a number of innovative and promising experiences. However, the review suggests that there is still a significant gap between the availability of compliance mechanisms and their application. One of the most striking lessons of the case studies is the importance of support and leadership by high-level management. Three other observations also bear mention: the importance of transparency and public participation; the emergence of adaptive management; and the abiding role for measures that compel or promote compliance and motivate the use of facilitative measures. The will to comply is a particularly important factor for compliance, and industry leadership can be an important driver of change within the sector. In the discourse on dams, there is a preference for proactive approaches that encourage compliance at the outset, rather than those that remedy non-compliance after the fact. Empirical research suggests, though, that a strategic combination of deterrence-based (compelling compliance) and cooperation-based (encouraging and facilitating compliance) measures is most effective.

There is a need for more knowledge and for more sharing of knowledge regarding approaches that can effectively promote compliance in different contexts. More examples are necessary from developing countries, civil law countries, and other regions. More examples and analyses are also necessary regarding how the different compliance approaches relate to one another. In addition, it is necessary to build compliance capacity of the various stakeholders involved with dams.

7.1 Characterization of the issue

1. The World Commission on Dams highlighted the fact that compliance remains a significant challenge for many dams. Throughout the 1980s and 1990s, in response to concerns about the environmental, social and economic impacts of dams, many countries developed laws governing social, environmental, economic and good governance aspects of dams. Similarly, the World Bank Group, regional multilateral development banks and other institutions around the world have articulated and refined environmental and social safeguard policies that seek to prevent, minimize and mitigate the impacts of dams. Many companies working on dams have developed internal policies that govern the design, construction and operation of dams. Consequently, a significant body of laws, policies and other normative frameworks now governs the various phases of dams, from planning and construction to operation and decommissioning. Practice has shown, however, that the development of such frameworks is not enough. In many instances, requirements are followed selectively, are not followed at all, or are too vague to properly assess whether they are being followed.
2. Accordingly, attention is focusing on how to promote compliance of dams with the relevant legal and policy frameworks. In addition to the initiatives to promote compliance by dam owners and authorities, compliance approaches from other sectors may be adapted to dams and their alternatives.⁵²
3. Practitioners, regulators, NGOs and scholars have identified essential elements of compliance (Cropper, Bradlow and Halle 2000, p. 28–36; Klimpt and others 2004, p. 13–14; Mitchell 1996). A clear, consistent and fair set of requirements and procedures assists all stakeholders to be aware of their respective rights and responsibilities, and helps determine whether a particular dam is in compliance. In addition to the regulatory framework, an effective system of incentives and disincentives is important to steer projects and institutions toward compliance. Monitoring and auditing conducted by the regulated entity, regulators and independent third parties (including NGOs and the public) can help

⁵² Cropper, Bradlow and Halle (2000) prepared an input to the World Commission on Dams highlighting numerous approaches that could be developed to improve compliance by dams, as well as some existing approaches.

to track compliance and identify emerging non-compliance problems early so that they can be rectified. Public participation, transparency and accountability are especially important to help ensure that dams comply with the applicable rules (Klimpt and others 2004). Independent means for resolving disputes, protecting rights and enforcing responsibilities are important. The final elements are institutional and human capacity, political will and addressing corruption.

4. Table 7.1 lists the different approaches for encouraging, facilitating and compelling compliance that may be appropriate in different contexts and oriented to different target audiences. Some tools are more appropriate for use by certain types of institutions. As illustrated in Table 7.2, certain institutions are more likely to use

particular compliance-enhancing measures than others.

5. When considering which approaches to use to promote compliance, it is essential to take into account the particular context of the dam. Such contextual considerations include, for example, the broader legal framework, leadership and will to comply, relationship between the dam and other stakeholders, capacity to comply (or to monitor and enforce compliance) and the corporate culture. If the dam owner or operator has made a commitment to corporate social responsibility, the company may see an economic, financial and reputational advantage in demonstrating compliance or even in initiatives that go beyond compliance with the applicable legal requirements. With respect to organizations that have incorporated the

Table 7.1 Compliance elements and approaches

<p>Incentives</p> <ul style="list-style-type: none"> Economic incentives <ul style="list-style-type: none"> Access to markets Certification Access to credit/equity Cross-compliance for subsidy eligibility Green taxes Financial assurance <ul style="list-style-type: none"> Performance bonds Insurance Licence renewal <ul style="list-style-type: none"> Joint relicensing Awards <p>Facilitative approaches</p> <ul style="list-style-type: none"> Detailed terms in contracts/licences Adaptive management Licence amendments Capacity-building Awareness raising Public participation <ul style="list-style-type: none"> Participatory processes Stakeholder involvement NGOs as watchdogs Integrity pacts Trust funds Ownership structure Implementation/management plan Environmental management system Compliance report Self-monitoring <ul style="list-style-type: none"> In-house compliance officer Independent monitoring Community monitoring 	<ul style="list-style-type: none"> Implementation committee <ul style="list-style-type: none"> Advisory committee External review body/mechanism Monitoring plan <ul style="list-style-type: none"> Panel of experts Transparency <ul style="list-style-type: none"> Information to facilitate compliance Technological innovation <p>Approaches to compel compliance</p> <ul style="list-style-type: none"> Disincentives <ul style="list-style-type: none"> Sanctions Debarment Blacklisting Fines Negative publicity/shame/peer pressure Dispute resolution <ul style="list-style-type: none"> Independent review mechanisms Ombudsperson Mediation and arbitration Enforcement <ul style="list-style-type: none"> Administrative enforcement <ul style="list-style-type: none"> Compliance orders Civil enforcement Criminal enforcement Courts Access to justice <ul style="list-style-type: none"> Transboundary access to courts <ul style="list-style-type: none"> Public interest litigation National courts International courts and tribunals
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concept of corporate social responsibility, a range of incentives and facilitative approaches may be appropriate, while more coercive mechanisms might be applicable for organizations with systems that are less self-regulatory; indeed, companies that have a well-established culture of compliance have a strong incentive to encourage governmental regulators to ensure compliance by their competitors who might otherwise be able to avoid investing capital and labour expenses in efforts to comply.

6. In practice – and in theory – it may be difficult to place a particular approach on the spectrum of compliance approaches. For example, independent review panels occupy the juncture between facilitative and coercive mechanisms.

7.2 Compliance: Current status in frameworks and in implementation

7. The compliance case studies selected for this Compendium illustrate a range of tools that have been identified by the World Commission on Dams and others as essential to an effective compliance regime. In most countries, there are few reliable data available on the compliance status of dams. Table 7.2 illustrates how the various examples selected cover the range of main elements characterizing compliance mechanisms. Together, this growing range of approaches constitutes a toolbox of

Box 7.1 Low-impact certification of the Tapoco project

In the United States, certification of dams as “green” or “low-impact” has grown in recent years. By having their dam certified as such, dam owners or operators are able to charge an additional premium for the energy that they generate. The certified Tapoco project comprises four dams and reservoirs on the Little Tennessee and Cheoah Rivers, generating 360 megawatts of hydropower. Certification by the Low-Impact Hydropower Institute closely tracks requirements for compliance with the law and licence provisions. The institute’s certification criteria provide that dams that go beyond compliance and meet specific criteria may receive an additional three years of certification. Interest in certified dams is growing, as state governments are exploring options for expanding renewable portfolio standards as one measure to address climate change, and low-impact hydropower may be part of such standards.

market-based and regulatory tools. As with conventional tools, different approaches are more appropriate in certain contexts than others. Sometimes, a single approach is effective; usually, though, it is necessary to employ a combination of tools.

7.2.1 Incentives

8. Incentives for compliance include awards, performance bonds, certification, green taxes, licences that require periodic appraisal or relicensing, access to credit or better terms of credit, and insurance (Box 7.1). Such approaches provide industry with more flexibility in achieving social and environmental goals, though they have yet to be applied extensively or fully effectively to dams.
9. Performance bonds and other financial assurances can provide a powerful incentive to undertake certain actions (or risk forfeiture of the surety). While these are widely used in the mining sector in some countries and could be used to ensure resettlement or decommissioning, performance bonds have yet to be fully used to promote compliance with environmental and social requirements in the case of dams.⁵³
10. There is some disagreement among regulators, NGOs and scholars about whether awards should be used to promote compliance, with several arguing that companies should not be recognized for merely fulfilling their legal obligations. As such, awards are often considered more appropriate for recognizing industry actions that go beyond compliance.
11. Economic incentives have yet to reach their potential. Requiring certification of dams to take advantage of market preferences has grown steadily in the United States and could be used in other countries, especially

⁵³ Performance bonds and other forms of financial assurance are common for construction of dams (and other large infrastructure). However, this is usually a requirement for financing, and not a regulatory requirement. Moreover, they generally do not apply to the management and operation stages or to environmental or social aspects.

Table 7.2 Main elements of compliance measures addressed by the selected case studies⁵⁴

Project	Incentives				Facilitative approaches										Compelling compliance		
	Economic incentives	Licence renewal	Awards	Licence terms	Adaptive management	Capacity-building	Public participation	Trust funds	Implementation plan/committee	Environmental management system/plan	Independent monitoring	Information/awareness	Disincentives/sanctions	Dispute resolution	Enforcement		
Tapoco project (USA)	Green										Blue						
Nandoni Dam (South Africa)	Blue		Green														
Tyrone copper mine (USA)	Green																
Clark Fork project (USA)		Blue		Blue	Green						Blue						
Pelton Round Butte project (USA)		Green		Blue	Blue												
St. Lawrence-FDR power project (USA)		Blue		Blue	Green												
Palmiet pumped power storage scheme (South Africa)											Blue						
North Umpqua project(USA)		Blue		Blue						Green				Blue			
Zosel Dam (USA/Canada)											Blue						
Maguga Dam (Swaziland)											Green			Blue			
Lesotho Highlands water project											Blue		Green				
American energy projects (USA)													Green				
Bujagali Dam (Uganda)														Blue			
Pangué Dam (Chile)														Green			
High Ross Dam (USA/Canada)														Blue			
Gabcikovo-Nagymaros (Hungary/Slovakia)														Blue			

54 This table illustrates the approaches that the case studies adopted to promote compliance. For simplicity, the specific compliance-enhancing measures have been consolidated from the more than 50 described in the consultant's report to 15. Accordingly, a single box may – and often does – entail a combination of measures. For more detail, see the case studies in the consultant's report on the issue (Bruch 2006). The blue boxes indicate use of the approach, and the green boxes indicate that the consultant considers this example to be a particularly informative application.

Project	Incentives			Facilitative approaches										Compelling compliance			
	Economic incentives	Licence renewal	Awards	Licence terms	Adaptive management	Capacity-building	Public participation	Trust funds	Implementation plan/committee	Environmental management system/plan	Independent monitoring	Information/awareness	Disincentives/sanctions	Dispute resolution	Enforcement		
Institutions⁵⁵																	
Regulator																	
Lending institution																	
Dam owner/operator																	
NGO/public																	

55 This part illustrates which approaches different types of institutions might consider applying, with green being deemed more appropriate or likely and blue being possible. The classification is based on the consultant's professional judgment.

those that mandate a certain percentage of clean energy as a strategy to combat climate change.⁵⁶ Green taxes have yet to be applied to any great extent to dams, although there is growing interest and experience in carbon taxes, which could strengthen the market position of hydropower, especially for complying facilities. Another underutilized incentive that could be used more frequently is internalizing the costs of non-compliance into the terms and conditions of contracts or licences. Cross-compliance – requiring compliance with a variety of requirements, including specific environmental requirements – has been used in the agricultural sector, and it is only starting to be developed for dams, within the broader context of renewable energy (for example in the European Union) (Farmer and Swales 2004; Hanrahan and Zinn 2005).

12. The licensing process can also provide an ongoing incentive to comply. Many countries provide that dams need to be relicensed periodically. This allows regulators the opportunity to update the licence to account for changes in environmental laws and conditions (as well as social considerations) that occurred since the original grant of the licence. To the extent that there are non-compliance problems, applications for new or renewed licences may take such non-compliance into account. For example, in one case, the United States Federal Energy Regulatory Commission refused to grant a permit to an applicant that had non-compliance problems.⁵⁷

7.2.2 Facilitative approaches

13. Facilitative approaches include both internal and external mechanisms. Since one of the most significant limitations

to compliance is limited capacity – of dam owners or operators to comply, of regulators to monitor and enforce and of the public to know about non-compliance and to act accordingly – approaches to build capacity of the various actors and stakeholders can be an important measure to promote compliance (UNEP 2005; Sand 1996). Capacity-building may be in the form of training, added technical equipment, or technical and legal expertise.

14. Internal compliance mechanisms can be practical and effective, particularly where there is institutional will to use such mechanisms. They may include, for example, development of a compliance plan or an environmental management plan for a particular dam, self-monitoring, appointment of an in-house compliance officer, following a code of conduct or entering into an integrity pact,⁵⁸ and adoption of an environmental management system (Box 7.2).

Box 7.2 Environmental management plan and environmental management system at Palmiet pumped storage hydropower station

Located within an area of unique natural heritage in South Africa, the Palmiet project comprises two dams on the Palmiet River catchment (500 square kilometres), primarily for hydropower (400 megawatts) and drinking water supply. The pumped storage hydropower station has voluntarily undertaken many measures to ensure compliance and good environmental performance. These include the development of a management plan and an environmental management system. The management plan initially applied to construction of the dam and was extended to the operations stage. The environmental management system was developed more recently and addresses operations. In recognition of the significance of these measures in promoting compliance, the dam has received numerous awards for its performance.

56 Low-Impact Hydropower Institute (LIHI): www.lowimpacthydro.org/; Green-e Program: www.green-e.org/; International Hydropower Association (IHA) Sustainability Guidelines: www.hydropower.org/downloads/IHA_SAP.pdf. Certification has been used in many countries to promote various environmental and social goals (UNEP 2006, p. 376–382; Bartley 2003).

57 109 FERC 62,225 (2004); 111 FERC 61,072 (2005).

58 http://www.transparency.org/global_priorities/public_contracting/integrity_pacts.

15. External facilitative mechanisms can also be effective in promoting compliance. They include independent compliance monitoring (sometimes by NGOs, sometimes by a panel of experts⁵⁹), good neighbour agreements and similar pacts, transparency and access to information, and meaningful public participation and consultation. Such mechanisms may require more trust: trust by dam builders and operators that their confidential business information will be respected; trust by external experts that the dam owners are not trying to hide anything; and trust by the regulators that facilitative mechanisms are respecting their authority. Increasingly, such mechanisms provide options for encouraging compliance, and dam builders and operators are starting to overcome their initial hesitation. Some of these mechanisms remain, however, underutilized (Box 7.3).

16. Three facilitative approaches that are emerging in the context of dams are the use of trust funds, participatory processes and inclusion of detailed terms and adaptive management in a licence or contract. Trust funds are increasingly used – especially

Box 7.3 Independent monitoring of the resettlement plan for Maguga Dam, Swaziland

Part of the Komati Basin Development project, the Maguga Dam is located on the Komati River (catchment 11,100 square kilometres), and is primarily for irrigation and peak hydropower (20 megawatts). It is governed by Swaziland national law and treaties between Swaziland and South Africa. Construction of the dam required the resettlement of several families and communities (see Box 5.4). In order to monitor compliance with the resettlement plan, an independent monitoring plan and body was established. In addition, an external panel of experts provided independent perspectives of various aspects of the project. One of the key lessons from the independent monitoring process of Maguga Dam was the importance of engaging the various stakeholders as early as possible.

59 For example, the World Bank and the government of Lao People’s Democratic Republic have engaged an international advisory group and a panel of environmental and social experts, respectively, for Nam Thuen 2. See <http://web.worldbank.org/>

in the United States – to ensure that the financial commitments of the dam builder or operator are fulfilled. In contrast to performance bonds, which are intended to be returned upon performance of the required activity, trust funds provide an independent mechanism for channelling the funds to their intended end. Trust funds need to guard against corruption or misuse of the funds. As such, care may be warranted in extending the use of trust funds to contexts where corruption or lack of transparency may be a concern.

17. One of the most common emerging facilitative approaches relates to the involvement of stakeholders in decision-making processes, including implementation and monitoring. These processes can include local communities, indigenous peoples and traditional authorities, environmental organizations, municipalities, and businesses, as well as the regulators and dam owners or operators. Through extended dialogues – for example during the licensing process – such multistakeholder processes can provide a means to build understanding, foster trust and facilitate solutions that are widely acceptable. While such processes take time and money, experience in the United States, South Africa, Swaziland and elsewhere suggests that the outcomes tend to be more robust, less likely to be litigated and better supported. In fact, in the United States, the alternative and integrated licensing processes – which include enhanced public participation – typically are faster than the traditional licensing process.

18. Transparency and public participation throughout the process can improve compliance by bringing additional perspectives and resources to bear, as well as by shining a public light on planning, implementation and operation (Killmer and Killmer 2005). As such, transparent and broad participatory processes can help ensure compliance with various requirements intended to fight corruption.

19. Detailed licences or contracts that spell out environmental, social and technical obligations are a new phenomenon

and are increasingly being used to help attain compliance (Box 7.4). The detailed stipulations contained in such licences fully acquaint a company with the compliance requirements of the relevant normative framework, enabling it to take the necessary actions. Detailed licences also help regulators and the public to know whether a dam is in compliance or not, and make it more difficult for companies accused of non-compliance to argue that the licence was so vague that they did not know what was required of them, as has happened in the past in the United States.

Box 7.4 Relicensing of the Clark Fork project, United States

The Clark Fork project consists of two dams on the lower Clark Fork River (catchment area 56,550 square kilometres) generating 700 megawatts of hydropower. The experience of relicensing the Clark Fork project was characterized by significant collaboration with various stakeholders from the outset. This established the Living License™, which promotes ongoing problem solving through adaptive management.⁶⁰ It also generated detailed licence provisions, including requirements for adaptive management, funding mitigation measures and creating an external review body.

The licence terms regarding performance, mitigation and enhancement added specificity to the general mandates of the laws governing the licensing and operation of hydropower dams. This makes it easier for the dam operator to know what is necessary for compliance and to take appropriate measures to ensure compliance.

These experiences led to the development of more cooperative approaches for (re-)licensing of dams in the United States.

20. At the same time, a number of new licences (or renewals) are integrating adaptive management (Box 7.4). This is an important measure, considering the long terms of licences in most countries. Since the environmental and social contexts are not necessarily fully understood and are likely to change over time, it is useful to have an approach that can take

⁶⁰ The Living License™ process is based upon effective collaboration and the principles of adaptive management, which Avista Corp. (United States) saw as a solution to avoiding the often contentious relicensing procedure.

into account the uncertainty inherent in the decision-making process. Adaptive management can provide a dynamic approach to reaching certain goals by periodically monitoring progress toward those goals and making adjustments as necessary. Adaptive management thus entails a long-term commitment to monitoring and periodic evaluation. At the same time, experience increasingly shows that adaptive management is not a panacea; unless carefully monitored, it can provide a loophole for those seeking to avoid taking action. One way to address this concern is through the development of multistakeholder processes that build trust among the various interests. It can also be labour intensive, as it involves people serving on committees, often volunteering their own time. The work can be very technical (for example examining the status of fisheries), and many people do not have such expertise. These concerns seem to be manageable, though, as the use of adaptive management continues to grow.

7.2.3 Approaches to compel compliance

21. If the various incentives and facilitative mechanisms are not effective, national and international bodies can review non-compliance, resolve disputes and (to varying degrees) apply sanctions for non-compliance. These include, for example, inspection panels, ombudspersons, panels of experts and compliance advisers in various multilateral development banks; independent mediation and arbitration; national courts; and in rare instances international courts. In the panoply of environmental management tools, these are generally considered the means of last resort. Historically, however, facilitative mechanisms often have been limited, and courts and tribunals have by default become the primary means to ensure compliance.
22. Disincentives and deterrents can help to compel compliance, especially when there is a credible threat that non-compliance will be caught and punished. These approaches include blacklisting (so that firms that do not comply are barred from subsequent contracts temporarily or permanently), shame and peer pressure,

bad publicity, and fines and penalties. These measures have had mixed results. For example, while the World Bank has blacklisted over 200 firms in the last decade, NGOs have complained that these are generally small firms and that many large firms that were responsible for significant non-compliance were never blacklisted (Cropper, Bradlow and Halle 2000, p. 81). As such, the corruption convictions – and subsequent debarment by the World Bank – associated with the Lesotho Highlands water project were significant as it was the first time that a major consultant of the World Bank had been debarred.⁶¹ Potential future developments in this area include the development of cross-listing of debarred firms and expanding national regulations and institutions governing debarment.

23. There is a synergetic relationship between the coercive approaches and the softer approaches to encourage and facilitate compliance. The coercive approaches have often provided the leverage to bring those involved to the bargaining table. Without the threat of litigation or substantial penalties, regulators and NGOs have often found businesses unwilling to focus on compliance (Rechtshaffen and Markell 2003, p. 237–51). In order to be effective, the penalty must be significant and there must be a credible threat of its application (Shimshack and Ward 2005; Becker 1968).
24. A number of people attribute the improved culture of compliance by dams in the United States to the 1986 amendment of the Federal Power Act. By this amendment, the maximum penalty increased from US\$5,000 total to US\$10,000 per day per violation. Shortly after the amendment and some initial prosecutions, industry and the Federal Energy Regulatory Commission became more proactive about drafting detailed licences and implementing the licence provisions to promote compliance. Thus, the credible threat of meaningful penalties for non-compliance motivated the development and application of

facilitative approaches in the United States (Box 7.5).

25. Within the enforcement and compliance community, there is substantial agreement about the abiding need for coercive approaches, even as the more facilitative approaches are developed and promoted (Rechtshaffen and Markell 2003; Zeegers and others 2002; Cruden and Rubin 2002; Cohen 2000; Sparrow 2000; Downs 1998; Rechtshaffen 1998). However, there is also a significant lack of data regarding how effective various compliance mechanisms are in practice; this is true for dams, but it is also true for environmental enforcement in general (Silberman 2000). One of the key gaps to improving compliance is understanding what motivates compliance (and non-compliance) in practice (Tyler 2006; Vandenbergh 2003; Raustiala 2000).
26. As with public participation in facilitative approaches, members of the public can have an essential role in helping to enforce the relevant social, environmental and

Box 7.5 Federal Energy Regulatory Commission civil enforcement: American Energy, Inc. hydropower projects

As illustrated by the American Energy hydropower projects, the United States Federal Energy Regulatory Commission has at its disposal an array of compliance tools with which it can increase pressure on a non-complying facility to come into compliance.

Following multiple infractions at six American Energy dams, the Federal Energy Regulatory Commission repeatedly notified the company about specific infractions, giving it chances to make remedial measures. As the initial compliance orders were ineffective, the commission used increasingly coercive approaches. Facing the prospect of civil enforcement, the parties negotiated a stipulation and consent agreement. This agreement set forth a fine of US\$300,000, with \$140,000 paid as a civil penalty and \$50,000 to an account maintained by a state agency to improve fish habitat and passage. By the agreement, \$110,000 of the penalty could be conditionally remitted, provided that the licensees achieved and maintained compliance, with one third of the amount to be forgiven in each of the first three years after the effective date of the agreement. In addition to the penalty, the agreement also included a compliance plan, which specified actions and a schedule for American Energy to remedy all remaining compliance deficiencies.

61 Case study on World Bank Debarment – Lesotho Highlands Water Project.

administrative requirements governing dams. Such enforcement can complement efforts by governmental bodies, particularly where governmental agencies are unable to enforce due to limited resources or political considerations. Enforcement by NGOs and other members of the public is increasingly common at the international, national and subnational levels. This is true for dams,⁶² as well as environmental enforcement more generally (Hunter 2005).



62 Case studies on Bujagali Dam – World Bank Inspection Panel, Pague Dam – International Finance Corporation (IFC) and the Office of the Compliance Advisor Ombudsman (CAO), and The High Ross Dam controversy. In addition, a few examples of dam-related cases from around the world, in which communities and governments sought to compel compliance, include: Athirappally Grama Panchayat v. Union of India, W.P.(C) Nos. 9542, 11254, & 260763 (High Ct. of Kerala 2006) (India); National Association of Professional Environmentalists v. AES Nile Power Ltd., Misc. Cause No. 268 of 1999 (1999) (Uganda); Kajing Tubek v. Ekran Bhd, [1996] 2 Malayan L.J. (Malaysia); Scenic Hudson Preservation Conference v. Federal Power Comm'n, 354 F.2d 608 (2nd Cir. 1965) (USA).

27. Coercive approaches have their limitations. They can take a long time, be expensive, and the outcome can be uncertain, particularly in high-profile cases where there is political pressure to reach a particular outcome. Moreover, courts, tribunals, and inspection panels may lack the means for enforcing their findings or judgments. This is particularly true in international disputes. Thus, as in both the Gabčíkovo-Nagymaros case (before the International Court of Justice) and the High Ross Dam (in the United States),⁶³ a political outcome may be the most likely resolution.

28. Notwithstanding their limitations, courts and tribunals have significant value. They provide a (usually) neutral and objective forum that can ascertain compliance or non-compliance. They can also provide leverage to motivate the concerned parties to negotiate an outcome. They provide a means to compel compliance. Finally, their presence can motivate the use of more facilitative approaches to promote compliance.

7.3 Conclusions and recommendations

29. The last decade has seen dramatic strides in measures to encourage, facilitate and compel dams to comply with laws, policies and other relevant norms. While much remains to be done, there are a number of innovative and promising experiences.

30. Anecdotal evidence – including the contextual backdrop against which some of the case studies took place – suggests that there is still a significant gap between the availability of compliance mechanisms and their application. In fact, successful efforts of specific dam owners and authorities to comply with the various legal and policy requirements, some of which are highlighted in this Compendium, often stand out as exceptions, and compliance by country is very uneven.

63 Case studies on the High Ross Dam controversy and Gabčíkovo-Nagymaros hydropower project – International Court of Justice.

31. What accounts for the differing cultures of compliance? It is not necessarily the state of economic development. For example, in the United States, the 1986 amendments to the Federal Power Act that gave regulators the ability to impose significantly larger fines – as well as subsequent efforts to encourage and facilitate compliance – appears to have motivated a shift to compliance. But before the amendments, there were often compliance difficulties.
32. One of the most striking lessons of the case studies is the importance of support and leadership by high-level management. Three other observations also bear mention: the importance of transparency and public participation; the emergence of adaptive management; and the abiding role for measures that compel or promote compliance and that motivate the use of facilitative measures.
33. The case studies suggest that the will to comply is a particularly important factor for compliance.⁶⁴ Many of the case studies examined in this study – especially those relating to incentives and facilitative mechanisms – are characterized by the resolution of high-level leadership within the institution that was building or operating the particular dam to operate in accordance with compliance standards. This was a refrain, frequently iterated in case study interviews by professional staff at different dams (Tapoco, Nandoni, Clark Fork, Pelton Round Butte, St Lawrence, Palmiet and Maguga) that was manifested not only as a desire to protect the environment, but also to actively engage local communities and stakeholders in the process.
34. Industry leadership can be an important driver of change within the sector. Success with one dam can establish new modalities that other dams subsequently follow. For example, the alternative licensing approach that the Clark Fork project initiated with the United States Federal Energy Regulatory Commission has since
- been codified by the commission into its regulations, informing other initiatives and laying the ground for more participatory licensing processes.
35. In the discourse on dams, there is a preference for proactive approaches that encourage compliance at the outset, rather than those that remedy non-compliance after the fact. In many countries, however, such practice is the exception rather than the rule as regards dams. The most well-developed and frequently used approaches for dam compliance tend to be courts and other means of last resort. Empirical research suggests, though, that a strategic combination of deterrence-based measures (compelling compliance) and cooperation-based measures (encouraging and facilitating compliance) is most effective.⁶⁵
36. Most of the approaches illustrated in the case studies can be adapted to a wide range of legal systems, dams (large, small; hydropower, irrigation, other purposes), cultural contexts, and countries with different states of economic development. Adapting particular approaches to specific contexts is probably preferable to replicating the approaches.
37. There is a need for more knowledge and for more sharing of knowledge regarding approaches that can effectively promote compliance in different contexts. More examples are necessary from developing countries, civil law countries and other regions. Additional examples could also help to identify contextual factors that influence the effectiveness of a particular approach. More examples and analyses are also necessary regarding how the different compliance approaches relate to one another. In addition, it is necessary to build compliance capacity of the various stakeholders involved with dams.

64 In addition to the case studies, see see Klimpt and others 2004, p. 11.

65 Harrison (1995), noting that “the findings thus constitute prima facie evidence that cooperative enforcement is less effective than the more prosecution-oriented approach, at least in North America”; and Burby (1995), finding that in 20 US state programmes to control non-point source pollution cooperative approaches were not as effective as those based on deterrence.

7.4 Case studies

38. Annex II lists the case studies selected to illustrate this chapter, as well as 11 other case studies, indicating the main elements, frameworks and examples of implementation involved. Additional information and a detailed description of these examples can be found in the report of the consultant (Bruch 2006).
39. The core of the review of practice is a collection of 16 case studies. The case studies were selected to reflect a range of stages of the project cycle, different sizes and uses of dams, geographic diversity, developed and developing countries, different normative frameworks and governance systems, and a range of approaches for encouraging, facilitating and compelling compliance. They generally reflect promising or successful experiences that may be adapted to many contexts, while recognizing the limitations described in Chapter 1. The 16 case studies illustrate many, but not all, of the approaches for promoting compliance. Although selected to illustrate a particular approach, each example entailed multiple compliance-promoting approaches. The final selection of examples was ultimately more geographically constrained than intended.
40. The consultant's report (Bruch 2006) contains an extensive set of references, including Internet links to the sources of information identified during the study of the issue. The report, which is open for review by the public, can be accessed in the DDP website at www.unep.org/dams/.

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8

Mark Edwards/Still Pictures

International policy concerning shared river basins

Summary

Some 60% of global freshwater flows are contained in the world's 263 international river basins. Hence much of the world's freshwater is contained in catchments shared by two or more countries. Basin management presents a significant challenge to the countries involved when a basin is intersected by one or more political boundaries, introducing an additional level of complexity. Specific interventions for diverting water and constructing dams require constructive cooperation, which may be difficult to achieve due to differences between riparian States in economic development, infrastructure capacity, political orientation and institutional and legal set-up.

This chapter focuses on the role that the international community might play in avoiding conflict and facilitating inter-State processes for shared rivers to move towards compromise solutions that are to the mutual advantage of the States involved. Three core elements of the international community involvement relate to international frameworks; international community actors; and the nature of involvement of the international community. The involvement of the international community is discussed on the basis of the key international frameworks, including the Helsinki Rules on the Use of the Waters of International Rivers and the United Nations Convention on the Law of the Non-navigational Uses of International Watercourses (yet to be implemented). Other regional frameworks and examples of agreements are considered. The participation of actors in the international community – the United Nations, bilateral and multilateral development partners – and the roles they play in mediation, technical assistance and funding are highlighted.

Subsidiary elements requiring consideration include the need for negotiation, geographic scope and the main issues dealt with by agreements establishing and influencing the context for the involvement of the international community. The influence of internal political dynamics in countries on negotiations on shared waters is also discussed.

The chapter concludes that while reports on conflicts on shared waters make headlines, cooperation on water issues rarely does. There is more evidence for water playing a catalytic role in encouraging cooperation than in triggering conflicts. Countries have entered into a significant number of agreements for a basin or region, a stretch of shared river or a certain project for cooperation and mutual benefit. There is available a comprehensive set of legal instruments on internationally shared waters. The international community, in the form of the United Nations, regional political and financial institutions and donor countries, has played an important role in adjudication, mediation, facilitation, technical assistance and funding. The international community has played and will continue to play a positive role in promoting cooperative management of shared water resources and creating favourable conditions for the planning and management of shared rivers in general, and for the development of certain projects in particular. The participation of diverse United Nations agencies, and of

international and regional political and financial institutions and donor countries, in facilitating shared water agreements between countries by providing technical advice and financial assistance, and by implementing solid initiatives such as the establishment of development funds, has been a key factor in resolving complex situations and fostering cooperation based on sustainable perspectives.

The cases analysed show an almost exclusive participation by public organizations. However, donors and national governments have recognized in some cases that the desired development objectives could only be achieved if the views and concerns of civil society were addressed, and in these instances strategic and long-term stakeholder and civil society participation at basin level was considered to make a vital contribution to the shared initiatives.

8.1 Characterization of the issue

1. Some 60% of global freshwater flows are contained in the world's 263 international river basins, which cover nearly half of the global land surface and are home to around 40% of its human population. Much of the world's freshwater is thus contained in catchments shared by two or more countries. It has long been understood that management of a drainage basin as a unit helps achieve optimal use and protection of resources. This can present challenges even when the basin is located entirely within a single country. But when a drainage basin is intersected by one or more political boundaries, an additional level of complexity is introduced (McCaffrey and Reed 2005).
2. The mismatch between political boundaries and natural river basins becomes a focal point for the difficulties of joint planning, including the allocation of costs and benefits – economic, environmental and social – making it difficult to realize the advantages of scale and other aspects of integrated management on the basis of the river basin. Furthermore, differences between riparian countries – in economic development, infrastructural capacity, political orientation and institutional and legal set-up – add further complications (WWAP 2003).
3. Due to these complexities and differences, difficulties arise that riparian States might not overcome without the assistance of the international community. In this situation, the intervention of the international community can lead to successful outcomes and discourage unilateral actions. To

understand the current situation with respect to this key issue, a study of the literature and, particularly, of selected examples was undertaken. Based on this study, the substantive features of the topic were distilled and are illustrated in Figure 8.1. Three main elements of the issue under consideration are the actors, the nature of the involvement and the frameworks under which the international community intervenes. The relative significance and role of these elements depend on the context provided by the geographic scope and the substantive matters under consideration. These elements are part of a negotiation process that is triggered by specific circumstances and eventually concluded in the form of an agreement.

8.2 International policy on shared river basins: Current status in frameworks and in implementation

4. The information analyzed and the examples reviewed indicate the current status of the issue in frameworks and their implementation. Table 8.1, based on a review of the selected case studies, shows how they illustrate the key elements identified.

8.2.1 Regulatory frameworks

5. Below are details on some of the key frameworks identified.
 - (a) **International frameworks**
6. The Helsinki Rules on the Uses of the Waters of International Rivers were adopted by the International Law Association in Helsinki in August 1966. Among the provisions it was established that “Each basin State is entitled, within

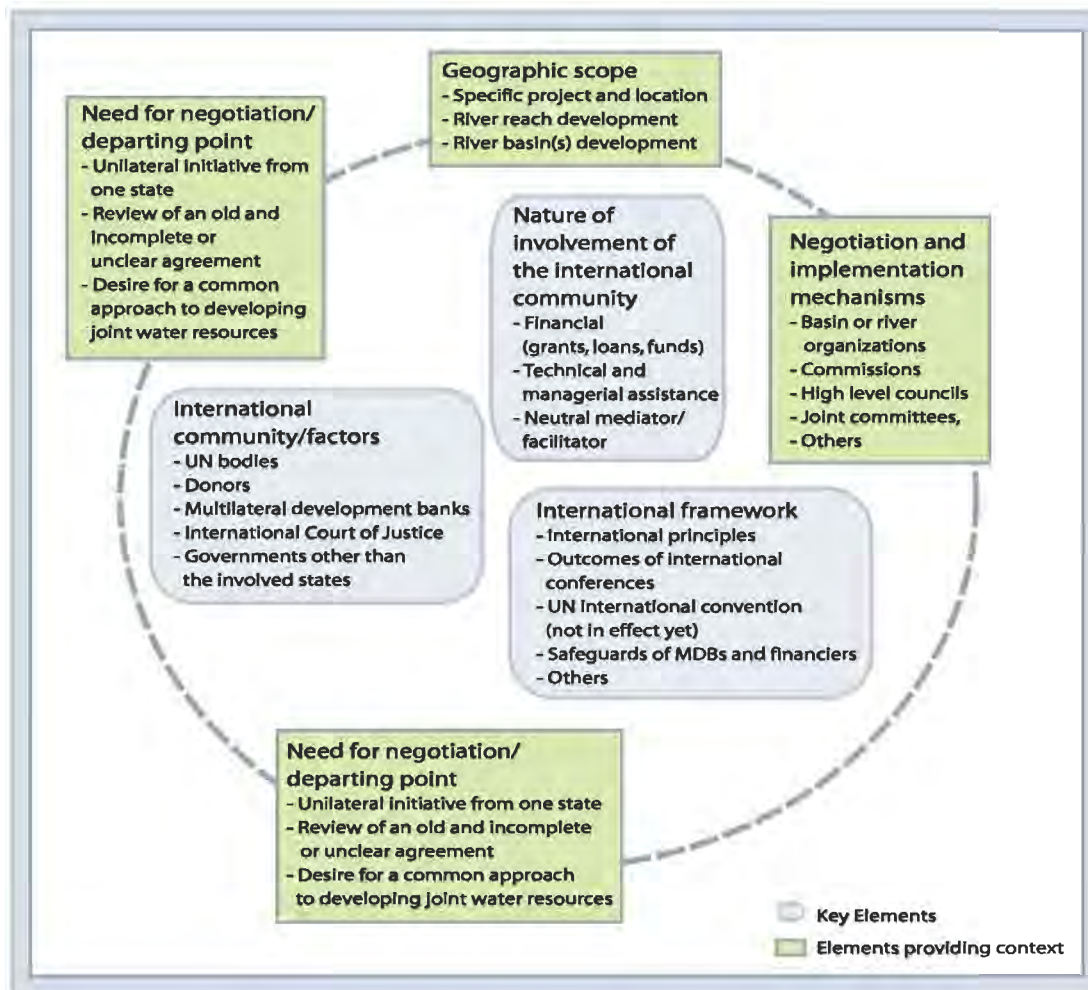


Figure 8.1 Elements of the International Policy on Shared River Basins

its territory, to a reasonable and equitable share in the beneficial uses of the waters of an international drainage basin.” What a reasonable and equitable share is needs to be determined in the light of all the relevant factors in each particular case, such as the geography and the hydrology of the basin; the past utilization of the waters; the economic and social needs of each basin State; the population dependent on the waters of the basin; and the degree to which the needs of a basin State may be satisfied, without causing substantial injury to a co-basin State (ILA 1966).

7. A State acts in accordance with the Helsinki Rules if, regardless of its location in a drainage basin, it furnishes notice to any other basin State, the interests of which may be substantially affected, of any proposed construction or installation that

would alter the regime of the basin in a way that might give rise to a dispute. It is recommended that the States concerned agree to submit their legal disputes to an ad hoc arbitral tribunal, to a permanent arbitral tribunal or to the International Court of Justice (ILA 1966).

8. The 1966 Helsinki Rules have no status in international law. While the principles set forth in them represent what many experts contend are long-accepted principles, these rules have not achieved the level of a binding international treaty.

9. The Declaration of the United Nations Conference on the Human Environment, held in Stockholm in June 1972, affirms, among other principles, that States have the sovereign right to exploit their own resources pursuant to their

own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction (UNCHE 1972).

10. Agenda 21, an outcome of the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992, states in Chapter 18: “Transboundary water resources and their use are of great importance to riparian States. In this connection, cooperation among those States may be desirable in conformity with existing agreements and/or other relevant arrangements, taking into account the interests of all riparian States concerned.”

11. In 1997, the United Nations General Assembly adopted the United Nations Convention on the Law of the Non-navigational Uses of International Watercourses (United Nations 1997). The Convention is a framework agreement setting forth general principles and rules that may be applied and adjusted by riparian States to suit the particular needs and conditions applicable in their basin or region. Due to the process by which the Convention was produced, a number of its provisions may be regarded as codifications of customary international law. The customary rules reflected in these provisions are, thus, binding on States even though the Convention itself is not yet in force as a binding treaty.

Table 8.1 Main elements of international policy addressed by the selected case studies⁶⁶

	International community / actors					Nature of involvement of international community			International framework referred to		
	UN bodies	Donors	Multilateral development banks	International Court of Justice	Other governments	Financial	Technical managerial	Neutral mediator	International principles	Outcomes of conferences	UN Convention (not in effect)
Nile Basin Initiative											
Zambezi SADC											
Water resource management on the Indus basin											
Ganges River											
Gandak project on Gandak River											
Kosi project on Kosi River											
Mahakali River											
Mekong hydropower development strategy											
Gabcikovo-Nagymaros											
Aral Sea basin											
Corpus-Itaipu Agreement, Paraná River											

⁶⁶ This table illustrates the relationship of the case studies to the key elements identified. For more detail, see the case studies in the consultant’s report on the issue (Pochat 2006). The blue boxes indicate use of the approach, and the green boxes indicate that the consultant considers this example to be a particularly informative application.

12. The Convention, which was negotiated on the basis of a draft prepared over a period of twenty years by the United Nations International Law Commission, embodies substantive rules on the use and protection of international watercourses and procedural rules on such matters as prior notification and consultation regarding new projects and the sharing of data and information. The principal categories of rights and obligations set forth in the Convention are (a) equitable and reasonable utilization and participation; (b) prevention of significant harm; (c) cooperation; (d) regular exchange of data and information; (e) no inherent priority of any one kind of use over other kinds of uses; (f) notification of planned measures with possible adverse effects on other riparian States; (g) protection and preservation of ecosystems; (h) prevention, reduction and control of pollution; and (i) notification of and cooperation with respect to emergency situations (United Nations 1977).
13. The World Commission on Dams views the principles of the Convention as an emerging body of customary law and considers that States will reduce the possibility of conflict if they are prepared to endorse and adhere to them.
14. In 2004, the International Law Association presented in its Berlin Conference the Water Resources Law, whose rules incorporate the experience of the nearly four decades since the Helsinki Rules were adopted, taking into account the development of important bodies of international environmental law, international human rights law and the humanitarian law relating to war and armed conflict, as well as the adoption of the United Nations Convention on the Law of the Non-navigational Uses of International Watercourses. Chapter III, on internationally shared waters, deals with such topics as participation by basin States, cooperation, equitable utilization, determining an equitable and reasonable use, preferences among uses, using allocated water in other basin States and avoidance of transboundary harm (ILA 2004).

(b) Regional frameworks

15. The United Nations Economic Commission for Europe has adopted two agreements of particular note concerning shared water resources. They are the 1992 Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE 1992) and the 1999 Protocol on Water and Health (UNECE 1999). Both agreements embody strong obligations to protect and preserve shared water resources in a way that does not endanger the health of the populations that rely upon them.
16. The signing of the Protocol on Shared Watercourse Systems in 1995 by the Member States of the Southern African Development Community (SADC) (Angola, Botswana, the Democratic Republic of the Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, the United Republic of Tanzania, Zambia and Zimbabwe), and the setting up of the SADC Water Sector Coordination Unit in 1996, are clear manifestations of SADC's recognition of the need for regional integrated water resource development and management on the shared watercourses of the region (Box 8.5). The main thrust of the Protocol is to ensure equitable sharing of water and efficient conservation of the scarce resource. A revised Protocol was signed in August 2000 (SADC 2000).
17. The EU Water Framework Directive binding on all its 25 Member States and providing for integrated river basin management is another important regional framework. It is complemented by the international commissions for the protection of the Danube, Elbe, Rhein, Maas and Odra Rivers.

(c) Particular agreements

18. While general principles and rules of international law provide guidance to riparian States, cooperative management of international drainage basins is best ensured and implemented through agreements between them. In these agreements the States apply and adjust

those general principles and rules to the specific characteristics of the basin and the circumstances and needs of the States concerned.

19. The particular agreements may deal with development at basin level or they may be specifically related to a river reach or a project. Their negotiation may be initiated by one of the involved States or may be in response to a shared initiative by some or all of them. Sometimes old agreements are in place but need adaptation to changed conditions, and therefore need to be reviewed.
20. The examples provide a wide array of particular agreements, which are either overarching or result from the negotiation processes described (Table 8.2).
21. The observations that can be made regarding the current status of the issue in frameworks are:
 - The analysis of the institutional framework shows that, though there is as yet no internationally binding agreement, there is an important set of sound documents, such as the Helsinki Rules (recently updated), the United Nations Convention on the Law of the Non-navigational Uses of International Watercourses, and a significant group of multilateral, regional and bilateral cooperation arrangements, that can serve as an adequate basis for the development of future agreements on internationally shared river basins.
 - Several cases in different regions of the world that have been analysed show how the involved countries have dealt with potential conflicts related to the construction and operation of dams or other water management measures. Other cases refer to the purpose of joint development of the resources of a basin or region. The agreements signed by the countries in that regard offer the legal and institutional framework on which they have based their decisions related to the construction and operation of dams and other water management measures.
 - It is noteworthy that, besides the

proposal of Pakistan to take the Indus basin issue to the International Court of Justice or the United Nations Security Council (a proposal rejected by India), there is only one detected case in which countries had to submit their differences for consideration by the International Court of Justice in 1993 Slovakia and Hungary submitted their dispute over the implementation of the Gabčíkovo-Nagymaros project (Table 8.2).

8.2.2 Participation of the international community

22. The ability of States to implement dam projects on shared rivers is often related to financial and technical support from external agencies. The processes that have led to the previously mentioned agreements have been carried out directly by the respective countries or – in most cases – with the participation of international organizations, which have played a facilitating role in order to assist the inter-State processes to progress to an acceptable compromise solution in the best interest of the States.
23. The simplest and most effective way the international community has impacted on inter-State relations leading to cooperative arrangements around shared river basins is through international legal principles, reflected in the international and regional frameworks and particular agreements mentioned in section 8.2.1.
24. The international organizations generally involved have been United Nations agencies or programmes and international or regional, political or financial, institutions. Donor countries have sometimes also had an important influence (Box 8.1).
25. The United Nations General Assembly was directly involved in negotiations between Bangladesh and India regarding the distribution of Ganges water from the Farakka Barrage (Box 8.2).
26. At the request of the Aral Sea basin countries, the United Nations Development Programme and the United Nations

Table 8.2 Examples of agreements on shared river basins and projects⁶⁷

Scope of agreement	Agreement and countries involved	Focus
Basin	La Plata basin (Del Castillo Laborde 1999; case study on Corpus-Itaipu Agreement, Paraná River) Asunción Declaration on the Uses of International Rivers (June 1971) Argentina, Bolivia, Brazil, Paraguay, Uruguay	Establishment of basic principles for water management in contiguous and successive international rivers
	Aral Sea basin (Boisson de Chazournes 1998; case study on Aral Sea basin) Agreement on Cooperation in the Management, Utilization and Protection of Water Resources in Interstate Sources (February 1992) Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan	Declaration of common interests and equal rights and responsibilities of the riparian countries in the use and protection of shared water resources
	Lower Mekong basin (Kirmani and Le Moigne 1997; case study on Mekong hydropower development strategy) Agreement on the Cooperation for Sustainable Development of the Mekong River Basin (April 1995) Cambodia, Lao People's Democratic Republic, Thailand, Vietnam	Establishment of the legal and institutional framework for cooperation to develop the Mekong's resources
	Nile basin (Nile Basin Initiative 2006; case study on Nile Basin Initiative) Nile Basin Initiative (February 1999) Burundi, Democratic Republic of the Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Uganda, United Republic of Tanzania	Establishment of a transitional mechanism towards the creation of a regional partnership to facilitate the joint pursuit of sustainable development and management of Nile resources
	Indus basin (Indus Waters Treaty 1960; Salman and Uprety 2002; case study on water resource management in the Indus basin) Indus Waters Treaty (September 1960) India, Pakistan	Agreement for increasing the amount of water available to the two parties and for apportioning the water resources of the Indus equitably between them
River and project	Mahakali River (Mahakali River Treaty 1996; Salman and Uprety 2002; case study on Mahakali River) Treaty between His Majesty's Government of Nepal and the Government of India Concerning the Integrated Development of the Mahakali River, Including Sarada Barrage, Tanakpur Barrage and Pancheshwar Project (February 1996)	Laying down of the principle that as a boundary river on large stretches, the Mahakali River will be developed in an integrated way to maximize the total net benefit from such development
Project specific	Kosi project (Kosi Project Agreement 1954, 1966; Salman and Uprety 2002; case study on Kosi project on Kosi River) Revised Agreement between the Government of India and the Government of Nepal on the Kosi Project (December 1966)	Establishment of the international rights and obligations of India and Nepal regarding the Kosi River
	Gandak project (Gandak Project Agreement 1959; Salman and Uprety 2002; case study on Gandak project on Gandak River) Agreement between His Majesty's Government of Nepal and the Government of India on the Gandak Irrigation and Power Project (December 1959)	Establishment of the international rights and obligations regarding the Gandak project. Specification that the project would be built by and at the cost of the government of India
	Gabcikovo-Nagymaros system of locks (Kurland, Fortunato and Barcus 1997; case study on Gabcikovo-Nagymaros). Treaty between the Hungarian People's Republic and the Czechoslovak People's Republic Concerning the Construction and Operation of the Gabcikovo-Nagymaros System of Locks (September 1977)	Establishment of the process for and the characteristics of the construction and operation of the Gabcikovo-Nagymaros system of locks as a joint investment
	Corpus and Itaipu projects (Agreement on Paraná River Projects 1979; case study on Corpus-Itaipu Agreement, Paraná River) Argentina-Brazil-Paraguay: Agreement on Paraná River Projects (October 1979)	Establishment of rules in order to harmonize the Brazilian-Paraguayan development of Itaipu with the Argentinean-Paraguayan development of Corpus, both on the Paraná River
	Farakka project (Treaty on Ganges Waters at Farakka 1996; Salman and Uprety 2002; case study on Ganges River) Treaty between the Government of the Republic of India and the Government of the People's Republic of Bangladesh on Sharing of the Ganga/Ganges Waters at Farakka (December 1996)	Establishment of the rules for the sharing of waters of the Ganga/Ganges River between both countries at Farakka Barrage
Lesotho Highlands Water Project (Treaty between the Kingdom of Lesotho and Republic of South Africa on Lesotho Highlands Water Project 1986)	Establishment of bi-national water transfer and hydroelectric project involving the construction of several large dams and tunnels.	

67 See also www.africanwaterlaw.org/, which contains a database of more than 150 transboundary water treaties for Africa.

Box 8.1 Mekong basin

Among the case studies, the greatest involvement of international organizations and donor countries occurs in the Mekong basin located in South-East Asia. Since the early 1950s, the United Nations Economic Commission for Asia and the Far East has been interested by the great potential of the Mekong River and initiated the concept of using this potential for economic development of the basin countries.

The Mekong Committee – established in 1957 – was supported by a secretariat headed by an executive agent who was appointed by the United Nations in consultation with four of the riparian countries (Cambodia, Lao People's Democratic Republic, Thailand and Vietnam). The administrative costs were financed by the United Nations Development Programme.

The cost of planning, investigations and studies was financed by such donor countries as Australia, Canada, France, Germany, Japan, the Netherlands, New Zealand, the United Kingdom and the United States. The Asian Development Bank also supported the effort.

The World Bank was requested to review an indicative plan prepared by the Mekong secretariat and lead the effort to mobilize donor support for its implementation.

Environment Programme, together with the World Bank, the European Union and other international aid agencies, provided support in assisting those countries in elaborating their ideas for a long-term solution to the basin's problems. This action culminated in the adoption of a comprehensive Aral Sea Basin programme in January 1994.

27. External financing agencies have influenced and can continue to influence countries that require financial or technical support for a significant proportion of the project itself and those that may be capable of undertaking the project independently, but rely on external support for other projects and programmes in the same sector. While the decision to build a dam is often considered a sovereign decision, the decision of external agencies to support

a dam depends on whether the proposed project complies with that agency's policies and guidelines.

28. In January 2001, the World Bank prepared an Operational Policy for use by its staff when dealing with projects on international waterways. The Operational Policy refers to projects on international waterways that may affect relations between the Bank and its borrowers and between States (whether members of the Bank or not). The Bank recognizes that the cooperation and good will of riparians is essential for the efficient use and protection of a waterway. Therefore, it attaches "great importance to riparians making appropriate agreements or arrangements for these purposes for the entire waterway or any part thereof". The Bank stands ready to assist riparians in achieving this end (World Bank 2001).

Box 8.2 Ganges River

On 21 August 1976, Bangladesh decided to take its dispute with India regarding the Farakka Barrage to the United Nations. A consensus statement issued by the General Assembly proved to be a stimulus to the resumption of Indo-Bangladesh negotiations over the Ganges. However, the political change that resulted from the elections in India in March 1977 proved more important to the Ganges dispute. The new government moved quickly in the direction of reaching an agreement with Bangladesh. The two parties were finally able to define the issues for a temporary arrangement for sharing the waters of the Ganges while a long-term solution for augmenting its flow during the dry season was being sought.

However, a long-term solution was not found and with direct communications deteriorating, Bangladesh raised the issue again at the United Nations. Under those circumstances, it looked quite clear that unless some major political changes took place in both countries, the deadlock would last for a long time. Major political changes did, indeed, take place in both India and Bangladesh in 1996. The new foreign minister of India, Inder Kumar Gujral, announced that India needed to be more generous with its smaller neighbours in seeking more regional cooperation, and should not always expect a quid pro quo in such dealings. This principle – which came to be known as the Gujral Doctrine – was a major factor in shaping the political and economic relations of India with its neighbours during the years that his party was in power.

Box 8.3 Indus basin

As regards the Indus basin, the World Bank was aware of the strained relations between India and Pakistan and was reluctant to make loans for projects that involved any unresolved disputes, not only because the investment was risky, but also because, once built, these projects could exacerbate the existing dispute.

The World Bank proposed a comprehensive plan for the joint development of the waters of the Indus basin, but the plan failed to take into account all the sensitive issues and was not endorsed by either party. From the proposals and counterproposals of both countries, it became apparent that political sovereignty and the joint development and use of water resources of a river basin as a single unit were not compatible. The only formula that was likely to provide an acceptable basis for settlement was the quantitative division of waters between the two countries, leaving each of the two countries free to carry out its own development independently.⁶⁸

Pakistan contended that a system of link canals would not be adequate to meet all uses without including storage reservoirs in the replacement works. Recognizing the difficulties of resolving the dispute without additional financing for the huge cost of replacement works, the Bank decided to mobilize funds from bilateral donors.

29. The Bank attempts to ensure that the international aspects of a project on an international waterway are dealt with at the earliest possible opportunity. If such a project is proposed, the Bank requires the beneficiary State, if it has not already done so, formally to notify the other riparians of the proposed project and its project details. If the prospective borrower indicates to the Bank that it does not wish to give notification, normally the Bank

68 The formula adopted at the time of the agreement in 1960, which resulted in negative social and environmental impacts on downstream provinces of the Indus basin, could not reflect the current approaches to integrated water resource management in transboundary waters, as described in the conclusions to this chapter. A stakeholder from the NGO advocacy group highlighted that it resulted in devastating social and environmental impacts on downstream provinces of the Indus basin.

itself does so. If the borrower also objects to the Bank's doing so, the Bank discontinues processing of the project.

30. The World Bank participated proactively in relation to the Indus basin system, where India and Pakistan – after their independence – needed to find the means of distributing their shared waters (Box 8.3).
31. Preparation of the Eastern Nile Subsidiary Action programme investment projects is funded through grants from the African Development Bank, the World Bank, and the governments of Austria, Canada, France, Japan, the Netherlands and Norway. The World Bank, the United Kingdom Department for International Development and the government of Finland are the main donors to the core budget of the Eastern Nile Technical Office and comprise its consultative committee (ENTRO 2006).

Box 8.4 Nile Basin Initiative

Under the auspices of the Technical Cooperation Committee for the Promotion of the Development and Environmental Protection of the Nile Basin (TECCONILE), with the support of the Canadian International Development Agency (CIDA), a series of 10 Nile conferences were launched in 1993 to provide an informal mechanism for dialogue among the Nile basin countries (Burundi, Democratic Republic of the Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Uganda and the United Republic of Tanzania) and the international community. As a result, TECCONILE prepared a Nile River basin action plan in 1995.

In 1997, the Council of Ministers of Water Affairs of the Nile Basin States (Nile-COM) asked the World Bank to lead and coordinate donor support for their activities. Thus, the World Bank, UNDP and CIDA became cooperating partners to facilitate dialogue and cooperation among the basin countries. A World Bank-managed, multidonor trust fund – the Nile Basin Trust Fund – was established as the preferred initial funding mechanism. Donors that contribute through the fund include Canada, Denmark, the Netherlands, Norway, Sweden and the United Kingdom (World Bank 2003).

Box 8.5 Zambezi action plan

On 28 May 1987 the governments of Botswana, Mozambique, the United Republic of Tanzania, Zambia and Zimbabwe signed an agreement on the action plan for the environmentally sound management of the common Zambezi River system, known as the Zambezi action plan, or ZACPLAN. To meet its goals, several programme categories and activities, known as Zambezi action plan projects (ZACPRO), were planned.

ZACPRO 6, Phase II project (ZACPRO 6.2) was designed based on the vision that the eight riparian States would achieve greater sustainable socio-economic development for all, through equitable and sustainable utilization of the shared water resources of the Zambezi basin.

In March 2001, within the context of implementing the Protocol on Shared Water Resources, the Southern African Development Community obtained funding to execute ZACPRO 6.2 from the Nordic countries through their development cooperation agencies – the Swedish International Development Cooperation Agency (SIDA), the Danish International Development Agency (DANIDA) and the Norwegian Agency for Development Co-operation (NORAD) (ZACPRO 6 2006).

32. Regional political groupings have played important roles in promoting processes towards cooperation agreements within the context of regional integration (Box 8.4 and Box 8.5).
 33. The establishment of funds is a particularly noteworthy illustration of the potential role of international financing organizations that are able to mobilize expertise and sizeable international financial resources for development (Salman and Upreti 2002). Among them, the Indus Basin Development Fund, the International Fund for the Aral Sea and the Nile Basin Trust Fund (Box 8.4) are significant examples.
 34. Whilst in some cases there was no direct involvement of the international community, its influence through other interventions encouraged the riparian countries to reach cooperative agreements.
 35. Financial assistance can support the execution of scientific and technical activities and the design of legal regimes, and can contribute to identifying and remedying problems. Financial and technical assistance may open a path for negotiating international agreements and setting up of mechanisms to monitor the regimes put in place and to allow for their adaptation to new needs (Boisson de Chazournes 1998).
- influence on the decisions regarding international rivers. The major political changes that took place in India and Bangladesh in 1996 serve as an example. This was a turning point in the relations between both countries, which had severely deteriorated due to differences over the operation of the Farakka Barrage on the Ganges River (see Box 8.2).
37. Another example deals with the cooperation between India and Nepal on the issues related to water, which has not been easy and forthcoming, in particular because of the extreme sensitivities and divergent interests and approaches of the political parties. Their bilateral relations have been heavily influenced by politics. The vested interests and inward-looking dynamics of the political actors in both countries, rather than technical discussions related to water, have influenced the decision-making process. During the early 1960s, criticism of the Kosi agreement – signed in April 1954 – intensified and pressure was put on the Indian government to revise the agreement (See Table 8.2). India expressed its readiness to amend it in light of the complaints lodged by Nepal. Because each and every provision of the 1954 agreement had been subjected to criticism, the modification was extensive.

8.2.3 Influence of the countries' political scene

36. The political will of different parties constituting the political scene in a particular country can have a significant
38. While the propensity of freshwater to strain relations between countries frequently makes headlines, the other side of the coin – water as an agent of cooperation – rarely

8.3 Conclusions and recommendations

- receives sufficient attention. Research has shown much more historical evidence of water playing the role of a catalyst for cooperation than acting as a trigger of conflict (United Nations Department of Public Information 2006).
39. Within the context of internationally shared river basins, the discussions on dam projects cannot be limited to the projects themselves and their diverse characteristics and impacts. They generally include a wider spectrum of issues related to the political relationships between the countries involved. It is necessary to analyse the issue within the broader context of water resource management in a selected river basin. In some cases, it is as important to deal with that context for the development of a certain project as with the project itself.
 40. Innovative solutions are needed to solve apparently intractable problems. Often, negotiations over shared rivers have developed into disputes over allocating what may appear as an insufficient resource. A more equitable and sustainable resolution may be possible by shifting from a primary focus on the allocation of the water resource to a focus on the benefits derived from the use of the water, capturing the consideration of wider development objectives and the diverse options available to meet them. This shift provides an opportunity to look more constructively at alternative programmes for meeting development objectives. It is possible to expand the horizon of negotiations further to include other issues. In the wider negotiation arena, the principles of sharing benefits can include an array of other resources, including cooperation in other sectors, or financial payments.
 41. The more collaborative basin management arrangements go beyond the issue of quantitative sharing of the waters of rivers to include other areas such as regulation, hydropower generation, flood control and environmental protection. Although international water rights have been essentially based on customary law for which the importance of rivers related mainly to consumptive use, it is very important to tackle issues pertaining to non-consumptive use of water (Salman and Uprety 2002). Indeed, an analysis of transboundary water law in Africa illustrates that there has been a gradual evolution away from simple allocation to inclusion of concepts such as “equity” and sustainable development”. (Lautze and Giordano, 2006).
 42. There is available a comprehensive set of legal instruments on internationally shared waters – as a product of sound studies and practical experience – that can serve as a valuable basis for future agreements between countries sharing a certain river basin or dealing with dam projects.
 43. The international community has played and will continue to play a major role in promoting cooperative management of shared water resources and creating favourable conditions for the planning and management of shared rivers in general, and for the development of certain projects in particular.
 44. The participation of diverse United Nations agencies, of international and regional political and financial institutions and donor countries, by offering their facilitating support for agreements between countries dealing with shared water problems, by providing technical advice and financial assistance, and by implementing solid initiatives – such as the establishment of development funds – has been a key factor for the resolution of complex situations and encouraging cooperation in building sustainable perspectives.
 45. The inclusion of all countries of a certain basin or river reach in joint dialogues or cooperative activities opens up new opportunities for arriving at mutually beneficial solutions. It also holds the potential for greater regional integration, both economic and political, with benefits far exceeding those derived from the basin or river itself.
 46. New management approaches are best based on regional cooperation principles, focusing on river basins, with an emphasis

on social equity, economic efficiency and environmental integrity. Public health and smallholder livelihood concerns can be explicitly and quantitatively incorporated into dam planning and operations within large basins (for example that of the Nile) (Lautze and Kirshen, 2006).

47. Adequate institutional arrangements and regulatory frameworks are a precondition for sustainable management of transboundary waters. The creation of shared watercourse bodies has become a helpful tool for the implementation of the agreements and of the programmes and projects resulting from them, as well as for the discussion of bilateral or multilateral issues (Boisson de Chazournes 1998). Such bodies are most effective and provide optimal benefit to States sharing a resource when they are utilized to identify and address all potential areas of misunderstanding and conflict in a frank and open manner (Tekateka 2003).
48. The cases analysed show an almost exclusive participation of public organizations. Donors and national governments have recognized in some cases that the desired development objectives

could only be achieved if the views and concerns of civil society are addressed. Stakeholder participation is a priority at all stages in project development, including the capacity to consult effectively and equitably with local communities in project-affected areas. At the same time it was recognized that there was a need for civil society to organize at a basin level in order to establish more strategic and long-term inputs into the respective initiatives (Nile Basin Initiative 2005).

49. The 2002 World Summit on Sustainable Development recognized that there are two tracks towards sustainable development. Track I refers to formal contacts, including negotiations, between political units. Track II refers to initiatives by informal, non-political groups to establish contacts between countries or other political units. Academic intellectuals, NGOs and other similar groups could be precursors to formal contacts at a political level between riparians in a transboundary basin (Stockholm World Water Week 2006). The two tracks are complementary and their potential synergy is great. Track I reflects past experience. Track I plus Track II may contribute to a constructive future.



Mark Edwards/Still Pictures

8.4 Case studies

50. The elaboration of this issue involved the identification and collection of information on examples of regional and international frameworks and implemented mechanisms that have contributed or may effectively contribute to the settlement of conflicts, either adopted by the countries sharing the basin, by established basin organizations or by international organizations that have the capacity to influence national and regional decision-making processes. The following two main criteria were adopted to select examples:
- Cases that enabled the analysis of the role, involvement and opportunities for collaboration of the international community in general, and funding agencies in particular, in the development of shared water resources involving dams.
 - Cases that incorporated the issue within the broader context of water resource management in a selected river basin. In internationally shared river basins the discussions on dam projects on shared rivers cannot be limited to the projects themselves and their diverse characteristics and impacts, since they generally impinge on a wider spectrum of issues related to the political relationships between the countries involved and their influence on the decisions on those projects.
51. Information on over 15 examples from across the world was reviewed and information and feedback was received from experts related to several projects. Based on these criteria, 11 examples in different situations in several regions of the world were finally selected for further analysis and documentation. A detailed discussion of these case studies is given in the consultant's report on the key issue (Pochat 2006). In Annex II the 11 examples from different situations in several regions of the world are summarized, analyzed in detail and documented.
52. The consultant's report contains an extensive set of references, including Internet links to the sources of information identified during the study of the issue. The report, which is open for review by the public, can be accessed in the DDP website at www.unep.org/dams/.

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9

Conclusions and recommendations

1. In addition to the findings around each issue resulting from the expert review of literature and examples commissioned by DDP, comments and discussions undertaken during the consultation process on the draft Compendium, particularly those made during the fifth meeting of the Dams and Development Forum (DDP 2007),⁶⁹ provide the basis for some general conclusions and recommendations as follows:

- The nine priority key issues dealt with by the Compendium cover a set of very important issues that, given appropriate consideration, would improve substantially the planning and management of dams. However, at the fifth meeting of the Dams and Development Forum stakeholders identified other issues that should also need to be elaborated in the same manner. Thus, further development

of the Compendium to include other very relevant issues, as well as taking into account the evolving nature of experience in this area, would be considered in future.

- The issues in the Compendium need to be better captured in national and international normative frameworks if they are to receive full consideration in decision-making. This requires the strengthening of national regulatory frameworks, filling gaps and harmonizing them at regional and even international level, including with financial safeguards and operational policies and current and developing corporate social responsibility approaches. Carrying out this action will benefit from a participatory approach that takes account of the views and expectation of stakeholders.
- Examples of practice on these issues with published or online information are limited. There is a need to enhance sharing of innovative approaches and practical experiences. Thus more examples will need to be documented and information on them made

⁶⁹ Inputs came also from other fora that considered the drafts (the Seering Committee and the Government Advisory Consultative Group) and individual stakeholders.

available and accessible to the public. Country-specific experiences should be documented and published. Developers and financiers will need to be encouraged to disclose information. Communication of the information to managers and practitioners needs to be improved.

- Examples of implementation available usually lack assessment of their outcomes by various stakeholders, particularly by local stakeholders. There is a need to open reports on experiences to public scrutiny and comment, and to establish the relevant feedback mechanisms that will result in improved practices and more effective and efficient implementation.
- Awareness and capacities of decision makers, managers and practitioners in dealing with these emerging crucial issues need to be enhanced and strengthened through sharing of experiences and training. The dissemination of relevant practices – real-life efforts to do things better – is

instrumental in this regard, and the Compendium intends to contribute to this endeavour.

2. In the field of dams planning and management, trends are set by the application of approaches and methods that assist in ensuring the best outcomes in a particular set of circumstances. As the knowledge base increases, the adoption of more relevant practices can be accelerated by sharing success, and failure, with others. This Compendium contains a wealth of information that could be used to build capacity and an improved understanding of all the relevant issues that need to be taken into account when developing and managing dams.

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Annex I: The Compendium

1. Background

1. The shared basis for DDP phase 2 agreed by the Project Steering Committee established among other issues that DDP should “produce non-prescriptive tools which can help decision makers” (DDP 2004). Accordingly, DDP Phase 2 established as one of its two main objectives “to produce non-prescriptive tools drawing on all appropriate existing bodies of criteria and guidelines for planning and management of dams and their alternatives, which can help decision makers”.
2. The need for a practical tool was identified by many stakeholders involved in the DDP dialogue activities during DDP Phase 1, at both national and global levels. It was recognized that integrating criteria and recommendations, such as the analytical framework proposed by the WCD, into local policy and regulatory frameworks involved the consideration of a broad range of issues, and it was agreed that these key issues should be identified and clarified as a prerequisite to further discussing their institutionalization into frameworks and

practices at country level. This was precisely the focus of the issue-based workshops convened by DDP during Phase 1 and Phase 2⁷⁰. From the discussions during the workshops, it became apparent that a tool should be produced to provide information regarding priority key issues and their implementation. Accordingly, the eighth meeting of the DDP Steering Committee recommended that UNEP compile a Compendium on relevant practices, and agreed on the nature and scope of the tool and the process for its elaboration. Based on these recommendations a phased process was adopted to elaborate the Compendium (Box A1.1). This publication constitutes the outcome of the first three stages.

2. Purpose and scope

3. The Compendium is intended to be a non-prescriptive informative learning tool to assist stakeholders (in general)

⁷⁰ See proceedings of DDP issue-based workshops, Dams and Development Forum meetings and scoping reports of national dialogue processes at <http://www.unep.org/dams>.

Box A1.1 Process of developing the Compendium

- Stage 1: Analysis of the key issues concerning planning and management of dams and their alternatives drawing on the WCD and other relevant materials, and selection of priority issues;
- Stage 2: A review of good examples of relevant practice of how the priority key issues were captured into national and international frameworks and their implementation;
- Stage 3: Consultation on collected case studies with governments (GACG) and stakeholders (SC and DD Forum) with the view of compiling such information into the Compendium and the publication of the document;
- Stage 4: Wide dissemination of the Compendium to countries and international and national organizations.

and decision-makers, managers and practitioners (in particular) involved in policy development, planning and management of dams and their alternatives. It aims to promote appropriate consideration of key environmental and social issues throughout the project cycle, thereby enhancing project sustainability, including development goals such as poverty reduction. It does so by providing factual information on how a set of key issues are dealt with by national and international policy and regulatory frameworks (“normative frameworks”), and on how these frameworks and issues have been implemented in practice in a range of countries and economies around the world. The objectives of the Compendium are summarized in Box A1.2.

4. Given that the examples are drawn from both developing and developed countries, the Compendium substantively contributes to South-South and North-South cooperation, showing how in different regions and settings common problems are tackled by both conventional and innovative measures.

3. Approach

5. The agreed purposes of the Compendium, coupled with the sensitive nature of the issues addressed, largely determined the approach adopted for its preparation. The approach is termed the ‘issue-framework-implementation approach’, and was developed in consultation with stakeholders during the first part of DDP Phase 2. The approach:

- Deals with a set of prioritized key issues and their main elements, focusing the analysis on the constituent elements of each issue rather than on more general principles or strategies.
- Looks at how the issues and their main elements have been considered by normative frameworks, thus, providing a regulatory context to the example and information to assist in the improvement of policies, laws and regulations.
- Describes relevant practices dealing with implementation of the issues and their main elements, while not judging

Box A1.2 Objectives of the Compendium

- To raise awareness on a set of priority key environmental and social issues that constitute core elements of sound planning and management of dams and their alternatives. While this set comprises only part of the broader range of issues that needs to be taken into account, they address fundamental emerging aspects, whose significance has been highlighted by the multi stakeholder global forum.
- To provide a basis for assessing and strengthening national and local policy, and legislative and regulatory frameworks, so that an appropriate consideration of these key environmental and social issues by decision-makers is legally backstopped and enforced. Experience shows that many of these issues require improved coverage in normative frameworks guiding the planning and management of infrastructure, particularly those dealing with the environment, water and energy.
- To provide information to assist bilateral and multilateral development agencies and banks and private financiers to assess and screen projects as part of their investment decision-making process, thereby fulfilling their safeguards, operational policies and performance standards.
- To provide information to facilitate management practices adopted by the private sector in the context of their corporate social responsibility, such as environmental management systems (ISO 14001 series) and the IHA sustainability guidelines.
- To constitute training material for capacity building of managers and technical practitioners dealing with the management and planning of dams and their alternatives. The effective and efficient implementation of policy, legislative and regulatory frameworks, either national or international, depends on the skills and capacities of managers and practitioners. In many cases these need strengthening to deal appropriately with the key issues described in the Compendium.

or evaluating the performance of the project as a whole.

(a) Strategy

6. The debate about dams and development has traditionally been around general principles/concepts and projects. The strategy taken for the elaboration of the Compendium departs from this approach with the aim of narrowing the divide. Firstly, as explained above, dealing with issues and clarifying them in terms of their main elements underpinned and guided the dialogue process put forward by DDP since its inception. It can be understood as a mechanism for moving the debate about the implementation of sensitive topics from the whole to the parts. This analytical process depoliticizes the discussion by placing it at a more technical and operational level. Focusing on issues and their main elements, rather than the more general principles or , helps people move away from polarized and conflicting positions to constructive consensus positions. However, this approach narrows down and segments the scope of the analysis and thus limits the number of issues addressed at one time.
7. Conversely, the strategy aims at disengaging from assessing projects and their performance as a whole, and focuses on the implementation of the key issues (or their main elements). It presupposes that, due to the complex nature of dam development, even if the overall outcomes are not fully satisfactory, they do not preclude the existence of specific positive and relevant practices that merit being shared with the public. The case studies collected in the process of elaborating the Compendium support this assertion.

(b) Practical examples

8. The practical nature of the Compendium was addressed through describing examples of relevant practice documented from a wide range of situations and countries. Keeping the contents informative and non-judgemental with respect to the practices described ensures its non-prescriptive character. Most literature about the performance of dams focuses on their

shortcomings and failures, highlighting the lessons that need to be learnt resulting from poor or insufficient consideration of appropriate environmental and social practices. While such an approach provides very valuable lessons learnt that constitute a sound basis for improvement, it was felt that the Compendium should, instead, present practices that, though not exempt from weaknesses, show a positive way forward. Thus, the examples were selected on the basis of the relevance of the practice to the issue addressed, while avoiding judgement about the quality of the practice in terms of good, better or best available. This approach of identifying positive practices underpinned the whole process of elaborating the Compendium. The concept of “good examples of relevant practices” was therefore adopted to refer to this approach and is utilized in all documents pertaining to the development of the Compendium.

9. Some of the environmental and social methodologies included in the Compendium are not yet common practice, and therefore are not widely incorporated in normative frameworks, particularly in developing countries. This situation highlights the objective of providing information on normative frameworks concerned with the key issues, to support the process of improving policies, laws and regulations. In the background reports, descriptions of the framework, be it a policy or strategy, law, regulation, programme or project, in association with the implementation of an issue, provides a formal context and a linkage to the prevailing institutional setting of the practice described.

4. Priority key issues

11. As mentioned above, DDP convened issues-based workshops during Phase 1 and Phase 2 aimed at clarifying the WCD and identifying the main issues involved, as a prerequisite to taking the discussion of their institutionalization to country level. These multi-stakeholder meetings covered the following : gaining public acceptance, comprehensive assessment of options,

addressing existing dams, and compliance. The proceedings of the workshops provided insight into the issues and main elements associated with the priorities discussed by the participants.

11. With the assistance of consultants, the DDP Secretariat went through a systematic process of configuring a list of key issues based on the outcomes of the issue-based workshops, the WCD final report and other reference materials, such as the World Bank operational policies, the IHA sustainability guidelines, and ICOLD environmental papers. A preliminary list of key issues (Table A1.1) was submitted to the fourth meeting of the Dams and Development Forum on 4–5 October 2005 in Nairobi, Kenya. The participants considered the list and prioritized issues for consideration when elaborating
12. Time and resource constraints limited the number of issues addressed by the first version of the Compendium to nine (Table A1.2). They include those issues prioritized by all working groups at the Forum meeting and cover all strategic priorities. It is envisaged that future versions of the Compendium will address the remaining key issues, provided that the methodological approach being tested through this first effort proves robust and the outcomes are well received by end users.
13. Selection of the nine priority key issues concluded the first stage of Compendium preparation. The second stage involved the

the Compendium. On the basis of the recommendations from the DD Forum, the DDP Secretariat (in consultation with the Steering Committee) selected the set of key issues presented in Table A1.1.

Table A1.1 Preliminary list of key issues submitted to the 4th Dams and Development Forum meeting on 4–5 October 2005 in Nairobi, Kenya

1. GAINING PUBLIC ACCEPTANCE 1.1 Stakeholder identification and involvement 1.2 Access to and dissemination of information 1.3 Stakeholders participation 1.4 Indigenous free, prior and informed consent	4 SUSTAINING RIVERS AND LIVELIHOODS 4.1 Policy 4.2 Baseline information 4.3 Environmental assessments 4.4 Environmental management plan
2. COMPREHENSIVE OPTIONS ASSESSMENT 2.1 Needs assessment 2.2 Identification of options 2.3 Strategic environmental assessment 2.4 Screening of options 2.5 Screening alternative dam projects	5. RECOGNIZING ENTITLEMENTS AND SHARING BENEFITS 5.1 Compensation policy 5.2 Social Impact Assessment 5.3 Benefit sharing 5.4 Resettlement Plans 5.5 Special agreements 5.6 Dispute resolution mechanisms
3. ADDRESSING EXISTING DAMS 3.1 Performance evaluation 3.2 Performance optimization 3.3 Outstanding environmental issues 3.4 Outstanding social issues 3.5 Decommissioning	6 ENSURING COMPLIANCE 6.1 Compliance enforcement 6.2 Compliance incentives 6.3 Compliance mechanisms 6.4 Compliance monitoring 6.5 Compliance Plan 6.6 Independent monitoring/review body 6.7 Anticorruption mechanisms
7 SHARING RIVERS FOR PEACE DEVELOPMENT AND SECURITY 7.1 National policy concerning shared river basins 7.2 International policy concerning shared river basins 7.3 Basin agreements 7.4 Dispute resolution	

Note: The full preliminary list comprised first, second and third order issues, organized according to the strategic priorities. The information resulting from the analysis of each issue will contribute to improvement of the contents of the list in all three levels. Therefore the list is a work in progress until all issues are analysed.

Table A1.2 Selected priority key issues

WCD Strategic Priorities	DDP Priority Key Issues for Inclusion in Compendium, v1
Gaining public acceptance	Stakeholder participation: scope, mechanism
Comprehensive options assessment	Identification of options
Addressing existing dams	Addressing outstanding social issues
Sustainable rivers and livelihoods	Environmental management plans
Recognising entitlement and sharing benefits	Compensation policy Social Impact Assessment Benefit sharing
Ensuring compliance	Compliance enforcement/mechanism
Sharing rivers for peace, development and security	International policy concerning shared rivers

commissioning of consultants to analyse each issue, obtain accessible secondary information and identify, select and describe relevant examples. The consultants produced reports characterizing the issues and giving detailed descriptions of examples of relevant practice. The reports take into account comments that emerged from the DDP consultation undertaken with Governments and stakeholders⁷¹. They can be accessed on the DDP website⁷² and are open to comment. These reports, under their author's name, constitute the main reference material for this Compendium.

14. The issue-framework-implementation approach entailed disaggregating the WCD into issues and their main elements. As a result of this analytical process, the inter-relatedness of the issues became readily apparent, as did both overlaps and gaps between the various issues. In addition, each issue was analysed independently by external specialists, resulting in a need for adjustment of the issue descriptions to avoid duplication and clarify linkages. These challenges were encountered in the second stage of the Compendium preparation process which involved the identification and collection of examples associated with each issue.
15. The presentation of the issues in Chapters 2 to 8 reflects the outcomes of this process.

71 Issued by stakeholders before and at the 2nd Government Advisory Consultative Group meeting (28-29 August 2006, The Hague) and 11th Steering Committee meeting (29-30 August 2006, The Hague).

72 www.unep.org/dams

Overall consistency between the chapters is assisted through cross-referencing.

5. Limitations

16. This first edition of the Compendium deals with a limited set of key environmental and social issues associated with the planning and management of dams and their alternatives. Knowledge and understanding of these issues is anticipated to increase over time. Despite efforts to identify and present examples of relevant practices from all continents, some regions remain under represented (for example the former Soviet Union and East Asia). Equally, while the Compendium reviews examples of implementation based on projects and programmes, it limits itself to discussing information relevant to illustrate the implementation of each issue without judging the overall success of the project or programme in question, which is a result of many factors.
17. The background studies on the key issues were prepared as a desktop exercise primarily based on publicly available sources of information. The causes and nature of most environmental and social problems associated with the key issues have been well described and captured in many documents, but mostly as “grey literature”⁷³. Mechanisms for addressing these issues are in many cases new and still rapidly evolving and, thus, little studied, documented and assessed. Consequently, lack of published and readily available

73 Documents not formally published and with limited circulation, such as project reports.

information on solutions and mechanisms was found to be a constraint affecting all nine key issues, particularly identification of options, outstanding social issues, and benefit sharing. The corresponding background reports serve, therefore, as introductory studies of these topics.

18. A number of case studies used in the background reports were not able to incorporate information about independent monitoring (evaluation of the effectiveness of mitigation measures), or, where this was done, the reports were either unavailable in the public domain or had been carried out by the project proponent or financier, and therefore potentially lacked credibility. The consultants attempted within their possibilities to fill the gaps, resorting to email and telephone consultations with affected people, reviews of the media, and input from the civil society stakeholder group in the DDP Steering Committee. Primary research to fill these information gaps would have involved a substantial change of scale well beyond the scope and resources allocated to the study.
19. Language barriers were a constraint to identify and access documentation, although essential translations were undertaken.
20. Although the key issues relate to topics with a long history of debate, some have only recently been placed on the political agenda and received intensive management attention. Consequently, approaches and tools to manage these issues are relatively new and rapidly evolving. Countries are going through testing and trial stages, and the ways they are addressing these issues provide useful lessons for further improvements and more effective solutions to the challenges.
21. In many countries, normative frameworks have evolved rapidly over the last decade. As a result, the laws and regulations governing many of the documented case studies are now out of date, having been superseded by revised legislation. Further, the results of the implementation of

new regulations are still not available in published format. This situation calls for further research.

22. Despite these limitations, the review of the available literature, the examples of relevant practice identified (including those not selected for referencing in this publication), and the expertise and experience of the consultants provide a basis from which to draw general conclusions and recommendations. It is expected that these will help to trigger actions to overcome the limitations noted above and to further develop the knowledge base necessary to manage these highly important matters.

6. Structure

23. The Compendium is divided into four parts: the introduction (Chapter 1); selected priority key issues for sustainable development of dams and their alternatives (Chapters 2 to 8); recommendations and conclusions (Chapter 9); and annexes.
24. Chapters 2 to 8 constitute the core of the Compendium. Information on the selected issues is presented following a template with five sections: the introduction; the characterization of the issue; the current status in frameworks and in implementation; the conclusions and recommendations; and the case studies. The section on current status discusses the normative frameworks applying to each issue and the implementation of the issue in relevant examples.
25. A table listing all the case studies used to illustrate each key issue is included in the annexes. In addition, a database of references for more information on the case studies under each selected issue will be available in printed and CD format and distributed in associations with the Compendium.
26. The Compendium summarizes the main observations from the analysis of the information. The summaries of some of selected case studies illustrating salient aspects of these observations are presented in boxes. More detailed information

on the analysis and all the selected case studies is found in the reports prepared by consultants on each selected issue on the DDP website⁷⁴.

27. Most of the priority key issues selected for the Compendium apply to the various stages of the project cycle. The case studies illustrating them have been selected in order to reflect these stages. Based on this understanding, the nine priority key issues are presented in the order that follows, to the extent possible, the sequence of their consideration in the planning process and project cycle. Some issues have been grouped into a single chapter due to their close links.

7. How to access information in the Compendium

29. Given the multiple purposes of the Compendium and the diverse interests and knowledge base of its users, there are several entry points to its use (Figure A1.1):

- **Issues.** As it is envisaged that it will be used primarily as a reference document by senior managers and practitioners to understand specific issues, how they are incorporated into frameworks and how they are dealt with in practice, the major entry point to the Compendium is through the issues, that is, what the reader wants to understand more about. The issues are disaggregated into the first and second level. The issues lead to frameworks and implementation examples, as well as to other information through the database of references linked to each issue.
- **Case studies.** The other main entry point to using the Compendium is through the case studies, if the reader has an idea about the case to learn from. The case studies lead to the main issues handled. From these, it will be possible to go to the frameworks and other issues related to the implementation of the main issues. Again, through the case studies, it will be possible to get additional information through the

database of references.

- **Countries.** An important subsidiary entry point to the Compendium is through individual countries and the case studies. Again, this will lead to the main issues, the frameworks and the examples of implementation. This will further lead to the database of references for more information.
- **Index.** The index is yet another important subsidiary entry point to the Compendium. An attempt has been made to capture key issues and projects in the index to assist users to enter the Compendium. The index leads to the issues, frameworks and examples of implementation from where it will be possible to go to the database of references for further information.

29. The Compendium provides an overview of key elements of issues, frameworks and examples of implementation in as concise a manner as possible. For more information,

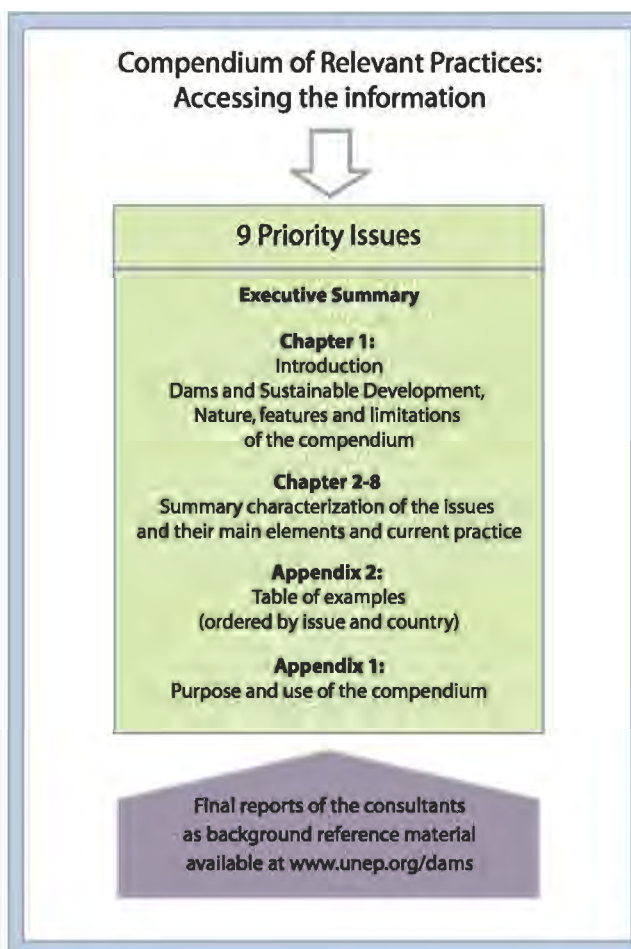


Figure A1.1 Accessing the information in the Compendium

74 www.unep.org/dams/.

the Compendium is supported by detailed reports on each key issue prepared with the help of consultants. Each report is linked to its respective database of references through which additional information can be accessed.

8. Transferability and adaptation of relevant practices

30. During research on the case studies, efforts were made to determine and describe the context of each example. This involved collecting and including information on the institutional and organizational setting, the associated project and stakeholders' assessment of the outcomes. The resulting description of the examples in the consultants' background reports follows a format established by DDP. The contextual information is intended to assist in determining the transferability of the practices from one situation to another.
31. When considering the possibility of applying practices in a different context the challenge is to find a way of relating the experience and understanding to the specific requirements of the new setting. This includes explicit and implicit factors

influencing the possibility of transferring solutions, such as understanding of place, market and industry knowledge, technological knowledge, water and energy systems and infrastructure, service delivery mechanisms and structures, the policy environment and the socio-economic environment⁷⁵.

32. Key elements of transferability include governance structure, cultural characteristics, political agendas and institutional systems. The possibility of applying some practices in dealing with specific issues related to dams and their alternatives is by and large shaped by the adopting country's governance structure. This, in turn, is constructed within a specific cultural environment and political ideology. The institutional system is particularly important as the development and management of water and energy is a matter of public-interest often entailing contentious issues (Figure A1.2).
33. When considering whether and how to adapt the practices described in the case studies, it is essential to duly consider the above-mentioned contextual aspects and their potential implications.

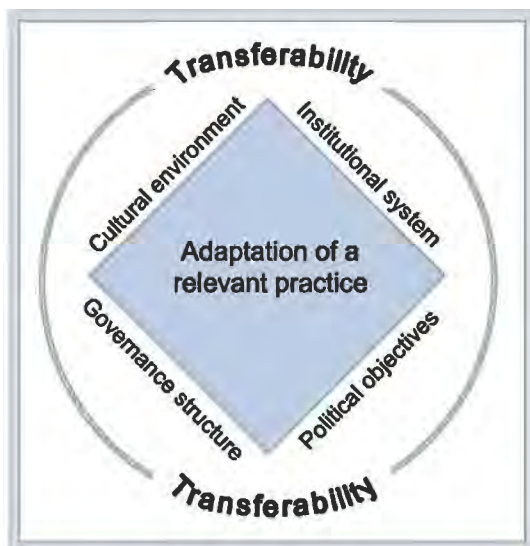


Figure A1.2 Transferability concept of relevant practices in dams development

75 http://www.prisma-eu.com/deliverables/Transport_Implications.PDF.

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ANNEX II: List of Case Studies Selected to Illustrate the Issues and their Main Elements

Issues	#	Sub-issue	Framework	Example of Implementation	Country
Identification of Options	1	Investigation, description and ranking of options to increasing agricultural production	Goulburn Broken Catchment management Authority Irrigation project. National Action Plan. Intergovernmental Agreement on Water quality and salinity of 2001	Goulburn Broken Region Catchment: Scenario Planning for Future Irrigation, Victoria (Implementation)	Australia
	2	Investigation and screening of least cost electricity generation options (Strategic social and environmental assessment of power development options, Assessment of power needs, Identification of power development options. Screening of options, Multi-criteria assessment)	Niles River Basin Initiative (1999). The Nile Equatorial Lakes Subsidiary Action Program (NELSAP) and the Eastern Nile Subsidiary Action Program (ENSAP)	NELSAP Power Development Programme (Sectoral level). Assessment of Power Development Options in the Nile Equatorial lakes Region (Strategic Planning)	Burundi, Rwanda, Uganda, Tanzania, Kenya, Sudan, Eritrea, the Democratic Republic of Congo (DRC), Ethiopia and Egypt
	3	Stakeholder participation in the selection of operating regime for hydroelectricity facility (Identification of alternatives for the operation of hydroelectric facilities, Screening and selection of an operating regime for a hydroelectric facility)	British Columbia Water Act (1996). Water Use Plan Guidelines (1998). Environmental Act. Fisheries Act (1985)	The British Columbia Water Use Guidelines (Operation)	Canada
	4	Identification of policy options for the internalisation of external costs of electricity generation	EU Directives 2003/54/EC and 2003/55/EC on the Internal Market in Electricity and Natural Gas European Commission White Paper on Renewable Energy (COM (1997)599) Council Decision 1999/21/EC, Green Paper of 29 November 2000 "Towards a European strategy for the security of energy supply," Decision No 1230/2003/EC Various Member States' Energy Policies and Strategies	EU Policy Options for Electricity Generation	EU countries
	5	Selection and ranking of medium hydropower options	National Hydropower Development Policy (1992). Environmental regulatory frameworks (1990s).	Medium Hydropower Study, (Sectoral level) (Strategic planning)	Nepal
	6	Investigation and screening of storage options	Ceara State Water Resources Act	Ceara Integrated Water Resource Management Project (Planning and Implementation)	Brazil
	7	Stakeholder participation in the validation of preliminary identification of options	South Africa, Water Act (1997), National Environment Management Act (1997)	Berg Water Project, Western Cape Town (Implementation)	South Africa
	8	Investigation of options for immediate needs and different stakeholders	Water Services Act (1997) National Water Act (1998). Environmental Conservation Act (1989). National Water Strategy. South Africa	Olifants River Water Resources Development Project (ORWRDP) (Project planning)	South Africa
	9	Stakeholder involvement in identification and selection of medium sized hydropower option	Ministry of Energy and Minerals - Hydropower Development Master Plan (1997) Uganda Energy Policy, 2002 Nile Equatorial Lakes Subsidiary Action Programme (NELSAP)	Identification of Power Development Options in Uganda (Strategic and Project Planning)	Uganda
	10	Needs assessment, description and ranking of community level options	Rural District Councils Act (1998) Traditional Leaders Act (2000)	Community Based Planning for Local Water and Food Security in Zimbabwe (Strategic Planning and Implementation)	Zimbabwe

Issues	#	Sub-issue	Framework	Example of Implementation	Country
Stakeholder Participation (mechanism)	11	Stakeholder analysis and consultation plan Features of tools and techniques Financing for stakeholder participation Timing Level of participation spectrum	Commonwealth Environmental Protection and Biodiversity Conservation Act Aboriginal and Torres Strait Islanders Act Integrated Planning Act 1997 Aboriginal Heritage Act 2003	Wivenhoe Dam Upgrade Option (Upgrading)	Australia
	12	Features of tools and techniques Financing for stakeholder participation Timing Level of participation spectrum	Waters Code 1934 1988 Brazil Constitution	Salto Caxias resettlement (Implementation and resettlement)	Brazil
	13	Stakeholder analysis and consultation plan Features of tools and techniques Financing of stakeholder participation Timing Level of participation spectrum	Canadian Environmental Assessment Act 1992 BC Heritage Conservation Act	Coquillam Dam Seismic Upgrade Project, BC (Upgrading)	Canada
	14	Stakeholder analysis and consultation plan Features of tools and techniques Timing Level of participation spectrum	James Bay and Northern Québec Agreement Chapter II of Québec's Environment Quality Act Canadian Environmental Assessment Act	Eastmain A1/Rupert Diversion Project, James Bay Hydroelectric (Project-planning)	Canada
	15	Features of tools and techniques Timing Level of participation spectrum	The Environmental Management Law (1999) Environmental Regulation for Electric Activities The Ecuadorian Electric Sector Law	Jondachi Hydropower Development (Project planning (Pre-feasibility))	Ecuador
	16	Stakeholder analysis and consultation plan Features of tools and techniques Timing Level of participation spectrum	Water Resources Act 1991 Environment Act 1995 The Water Resources England and Wales: The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 EU Water Framework Directive Aarhus Convention	Ribble River Basin Planning (River basin planning)	England
	17	Stakeholder analysis and consultation plan Features of tools and techniques Timing Level of participation spectrum	Environmental Protection Law 1999 Forestry Law 1996 Water Law 1996 Electricity Law 1997 The World Bank's Public Consultation and Acceptance Process for the Nam Thuen 2 Hydroelectric Project	Resettlement re Nam Theun 2 Dam, Hydropower Project (Project implementation and resettlement)	Lao PDR

Issues	#	Sub-issue	Framework	Example of Implementation	Country
Stakeholder Participation (mechanism)	18	Features of tools and techniques Timing Level of participation spectrum	Land Acquisition Act of 1977	Andhikhola Hydropower (Project planning, construction, implementation, operation, resettlement)	Nepal
	19	Features of tools and techniques Timing Level of participation spectrum	Resource Management Act 1991 (RMA) The Treaty of Waitangi	Manapouri Monitoring (Operation and Monitoring)	New Zealand
	20	Features of tools and techniques Timing Level of participation spectrum	Revised Protocol on Shared Watercourses in the SADC Region Constitution of the Republic of South Africa Act Development Facilitation Act National Heritage Resources Act National Water Act Promotion of Access to Information Act Promotion of Administrative Justice Act Expropriation Act Communal Land Rights Act National Environmental Management Act Environment Conservation Act Conservation of Agricultural Resources Act Guideline Document - Environmental Impact Assessment Regulations on the implementation of Sections 21, 22 and 26 of the Environment Conservation Act Generic Public Participation Guidelines, 2001 of the Department of Water Affairs and Forestry Guideline Document - Environmental Impact Assessment Regulations	Olifants River Water Resources Development Project (ORWRDP) (Project planning and EIA)	South Africa
	21	Features of tools and techniques Financing for stakeholder participation Timing Level of participation spectrum	National Involuntary Resettlement Policy of 2003 National Environmental Act of 1980 Environmental Regulations of 1993 of the Central Environment Authority National Policy on Involuntary Resettlement (NIRP) Regulations of the Urban Council	Upper Kotmale Hydropower Project (Resettlement)	Sri Lanka
	22	Features of tools and techniques Timing Level of participation spectrum	Natural Environmental Quality Act of 1992 Information Act 1997	That-Baan Community Response (Community-based monitoring of implementation and operation)	Thailand
	23	Stakeholder analysis and consultation plan Features of tools and techniques Financing for stakeholder participation Timing Level of participation spectrum	National Environmental Policy Act (NEPA) National Pollutant Discharge Elimination System (NPDES) Federal Clean Water Act Endangered Species Act, and on cultural or historic properties under the National Historic Preservation Act	Tennessee Valley Authority (TVA) River Operation Planning, Reservoir Operations Study (Implementation and Operation)	USA
	24	Stakeholder analysis and consultation plan Features of tools and techniques Financing of stakeholder participation Timing Level of participation spectrum	Commonwealth/Federal Government Legislation. Environment Protection and Biodiversity Conservation Act, 1999. Environmental Protection Act, 1994. Queensland State Legislation. State Development and Public Works Organisation Act, 1971. Water Infrastructure Development (Burnett Basin) Act, 2001.	Burnett River Dam, Burnett River, Queensland (Construction)	Australia

Issues	#	Sub-issue	Framework	Example of Implementation	Country
Social Impact Assessment	25	Social Impact Assessment Mitigation Monitoring	Brazilian National Environment Policy Act (Law 6938/81). Inter-American Development Bank Environmental Policy: Operational Policy – 703. Inter-American Development Bank Involuntary Resettlement: Operational Policy 7-10. Inter-American Development Bank Environment and Safeguards Compliance Policy. National Heritage Resources Act	Campos Novos Hydroelectric Power Project, Canoas River (Construction)	Brazil
	26	Public Involvement Alternatives, Mitigation.	Brazilian National Environment Policy Act (Law 6938/81). CONAMA Resolution No. 1 (January 1986). CONAMA Resolution No. 2 (April 1996). CONAMA Resolution No. 237 (December 1997).	Salto Caxias Hydroelectric Power Plant, Iguagu River (Operation)	Brazil
	27	Public Involvement. Profile of Baseline Conditions. Scoping and Projection of Estimated Effects. Estimate of Indirect and Cumulative Impacts. Mitigation. Monitoring.	Canadian Environmental Assessment Act (1992). British Columbia Environmental Assessment Act (1995)	Brilliant Expansion Project, Kootenay River (Revamp- Redevelopment)	Canada
	28	Public Involvement. Identification of Alternatives. Prediction and Evaluation of Responses to Impacts.	Environmental Protection Law of the People's Republic of China (1989). World Bank Operational Policy 4.01 Environmental Assessment. World Bank Operational Directive 4.30 – Involuntary Resettlement.	Xiaolangdi Dam Project, Yellow River (Operation)	China
	29	Profile of Baseline Conditions. Prediction and evaluation of responses to impact Mitigation. Monitoring	Article 50 of the Constitution of the Islamic Republic of Iran Land Acquisition Law (1980) Law on Economical, Cultural, Societal Development (1989) Law for Environmental Protection and Development (1991) Article 50 of the Constitution of the Islamic Republic of Iran. Land Acquisition Law (1980). Law on Economical, Cultural, Societal Development (1989). Law for Environmental Protection and Development (1991). World Bank Operational Policy 4.01 Environmental Assessment. World Bank Operational 4.12 Involuntary Resettlement.	Alborz Integrated Land and Water Resource Management Project (Construction (Alborz Dam) and development (ALLWMP))	Iran

Issues	#	Sub-issue	Framework	Example of Implementation	Country
Social Impact Assessment	30	Public Involvement Profile of Baseline Conditions. Mitigation. Optimization of benefits.	Nepal National Environmental Impact Assessment Guidelines (1993). Environmental Protection Act (1996). Nepal Environmental Rule (1997 as amended in 1999). Acquisition, Compensation and Rehabilitation Plan (1999)	Upper Seti Storage Hydroelectric Project, Seti River (Planning)	Nepal
	31	Profile of Baseline Conditions. Projection of Estimated Effects.	Niger "Code de l'Environnement". World Bank Operational Policy 4.01 Environmental Assessment	Kandadji Dam Project, Niger River (Planning)	Niger
	32	Public Involvement. Alternatives. Profile of Baseline Conditions. Prediction and evaluation of response to impacts Mitigation.	Polish Environmental Protection Law (2001). Polish Historical Conservation and Protection Act (2003). Various World Bank Policies: Operational Policy 4.01 – Environmental Assessment. Operational Policy Note 11.03 – Cultural Property. Operational Policy 4.12 – Involuntary Resettlement. Bank Policy 17.50 – Public Disclosure. Various EU Directives and International Treaties. EU Council Directive 85/337/EEC on Environmental Impact Assessment. EU Council Directive 2001/42 (Strategic Environmental Assessment Directive). World Cultural and Natural Heritage (1972). Convention of Environmental Impact Assessment in trans-boundary context (1991). Aarhus Convention ¹⁰ (1998).	Odra Dam, Odra River Basin Flood Protection Project (Planning/river basin)	Poland
	33	Public Involvement. Alternatives. Profile of Baseline Conditions. Scoping and Projection of Estimated Effects. Mitigation.	National Environmental Policy (1990). Environmental Protection Act (2000). World Bank Safeguard Policies. OP and BP 4.01: Environmental Assessment. OP 4.12: Involuntary Resettlement.	Bumbuna Hydroelectric Project, Seti River (Construction)	Sierra Leone
	34	Public Involvement. Scoping and Projection of Estimated Effects. Mitigation.	Republic of South Africa (RSA)/KaNgwane ¹¹ Permanent Water Commission Policy	Driekoppies Dam (Implementation)	South Africa

76 Dealing with the free access to information and public participation in environmental issues.

Issues	#	Sub-issue	Framework	Example of Implementation	Country
Social Impact Assessment	35	Social Impact Assessment: Public Involvement. Alternatives. Scoping and Projection of Estimated Effects. Prediction and Evaluation of Responses to Impacts. Estimate of Indirect and Cumulative Impacts. Mitigation.	Rio Earth Summit 1992 – Concept of Sustainability. World Commission on Dams – Strategic Priorities. South Africa’s international agreements and obligations. Revised SADC Protocol on Shared Watercourses. South Africa’s national legislation and associated regulations. Constitution of the Republic of South Africa Act (Act 108 of 1996) as amended by the Constitution of Republic of South Africa Amendment Act (Act 35 of 1997). National Environmental Management Act (Act 107 of 1998). Environment Conservation Act (Act 73 of 1989). National Water Act (Act 36 of 1998). National Heritage Resources Act (Act 25 of 1999).	Olifants River Water Resources Development Project (Phase 2) (Policy/Strategy/River Basin)	South Africa
	36	Social Impact Assessment: Prediction and evaluation of response to impact Mitigation.	Integrated Environmental Management Principles. Constitution of the Republic of South Africa Act (Act 108 of 1996) as amended by the Constitution of Republic of South Africa Amendment Act (Act 35 of 1997). Environment Conservation Act (Act 73 of 1989).	Thukela Water Project, Thukela and Bushman’s Rivers (Feasibility)	South Africa
	37	Social Impact Assessment: Alternatives. Prediction of responses to impacts.	Law on Environmental Protection, 1993. Decree on Providing Guidance for the Implementation of the Law on Environmental Protection, 1994 (Government Decree No. 175-CP, 1994). Guidelines for Resettlement and Rehabilitation in Vietnam. Environment Policy of the Asian Development Bank, 2002. Asian Development Bank: Involuntary Resettlement, 1995.	Son La Hydroelectric Power Project, Da River (Planning and Construction)	Vietnam
	38	Social Impact Assessment: Prediction and evaluation of response to impacts. Estimate of indirect impacts.	Law on Environmental Protection, 1993. Decree on Providing Guidance for the Implementation of the Law on Environmental Protection, 1994 (Government Decree No. 175-CP, 1994). Guidelines for Resettlement and Rehabilitation in Vietnam. World Bank Operational Policy 4.01 Environmental Assessment. World Bank Operational Directive 4.30 Involuntary Resettlement.	Tuyen Quang Dam and Flood Prevention Project, Gam River (Planning (feasibility))	Vietnam
Addressing Outstanding Social Issues	39	Remedy fund for indigenous communities	James Bay and Northern Québec Agreement (JBNQA, 1975). Naskapi Indian Band Agreement (NEQA, 1978).	James Bay Complex	Canada
	40	Remedy fund	Land Administration Law of the Peoples Republic of China (1986, revised in 1996) Later stage support fund (LSSF)	Three Gorges Dam	China
	41	Remedy fund	Land Administration Law of the Peoples Republic of China (1986, revised in 1996) Post resettlement and rehabilitation fund	Danjiangkou Dam	China

Issues	#	Sub-issue	Framework	Example of Implementation	Country
Addressing Outstanding Social Issues	42	Ombudsman	Rheinisch-Westfälische Elektrizitätswerk resettlement policy (2001) Jüchen Agreement (1998)	Lignite exploitation	Germany
	43	Remedy fund	World Bank Operational Manual Statement 2.33 – Social Issues Associated with Involuntary Resettlement in Bank-Financed Projects" in 1980. Revised in 1986 (Operations Policy Note 10.08), 1990 (OD 4.30) and 2001 (OP 4.12)	Chixoy dam	Guatemala
	44	Remedy fund	National Law and Corporate Social Responsibility Watercourse Regulation Act Master Plan and Protection Plans	Glomma-Lågen River Basin	Norway
	45	Remedy fund	Pakistan Land Acquisition Act (1894 with subsequent amendments) World Bank and the Asian Development Bank Operational Policy on Involuntary Resettlement (OPIR)	Ghazi Barotha & Tarbela	Pakistan
	46	Restitution of land titles	1997 White Paper on Land Policy Right to Land Restitution (1994). Land Restitution Programme	Kruger National Park	South Africa
	47	Remedy fund	World Bank Bank Operational Policy on Involuntary Resettlement (OPIR, 1980) Thailand's Electrical Generating Authority (EGAT) policy	Pak Mun Dam	Thailand
	48	Verdict on claims by native Americans	Federal Law (USA) Supreme Court of Justice (USA) US Congress	Grand Coulee dam	USA
	49	Monetary compensation for lost assets Livelihood restoration and enhancement (sustainable agricultural and non-agricultural employment) Community development	Brazilian Environmental Legislation (1981, revised in 1986 and in 1988 Constitution) Second Master Plan for the Protection and Improvement of the Power Sector Works and Services (1990).	Saito Caxias Dam (1998)	Brazil
Non Monetary Benefit Sharing	50	Monetary compensation for lost assets Livelihood restoration and enhancement (local employment during construction and operation) Community development Catchment development (custodianship or management of catchment resources)	Hydro-Québec's Integrated Enhancement Program (1994) Participatory Approach on Partnerships with Indigenous Communities	Sainte-Marguerite-3 Dam (2002)	Canada
	51	Livelihood restoration and enhancement Community development Catchment development (environmental enhancement for wildlife resources)	Opimiscow-La Grande (1992) Agreement between Hydro-Québec, Grand Council of the Crees – Eeyou Istchee (GCC-EI) Cree Regional Authority and the Cree Nations of Chisasibi and Wemindji.	Lafarge-1 Dam (1994)	Canada
	52	Monetary compensation Livelihood restoration and enhancement (sustainable agricultural and non-agricultural employment) Community development	Chinese Draft Regulation for Land Acquisition and Resettlement for the Construction of Large and Medium Sized Water Conservancy Projects (1991). World Bank Operational Directive OD 4.30 on Involuntary Resettlement (1990).	Shuikou Dam	China
	53	Monetary compensation for lost assets Livelihood restoration and enhancement (sustainable agricultural employment) Community development	Resettlement Policy of the Electricity Sector in Colombia (1992).	Urja 1 Dam (2000)	Colombia
	54	Monetary compensation for lost assets Livelihood restoration and enhancement (sustainable agricultural employment) Community development	Costa-Rican expropriation law Inter-American Development Bank requirements for development projects during 1970s.	The Arenal Dam (1980)	Costa Rica

Issues	#	Sub-issue	Framework	Example of Implementation	Country
Non Monetary Benefit Sharing	55	Monetary compensation Livelihood restoration and enhancement (sustainable agricultural and non-agricultural employment) Community development (roads, schools and health services)	Indian Land Acquisition Act (1894) National Hydroelectric Power Corporation's Resettlement and Rehabilitation Framework (date unknown) Canadian International Development Agency Swedish International Development Agency requirements for bilaterally-funded development projects.	Indian Land Acquisition Act, NHPC Resettlement and Rehabilitation Framework and CIDA and SIDA Requirements for Development Projects: The Chamera and Uri Dams	India
	56	Monetary compensation Livelihood restoration and enhancement (reservoir fisheries) Community development	Indonesian expropriation law (1961) World Bank Operational Manual on Social Issues associated with Involuntary Resettlement (1980)	Saguling and Cirata Dams in West Java (1988)	Indonesia
	57	Monetary compensation Livelihood restoration and enhancement (sustainable agricultural and non-agricultural employment) Community development (roads, schools and health services) Compensation defined through multi-stakeholder consultation forum. Settlement of outstanding compensation claims from the Tarbela dam	Pakistan's Land Acquisition Act (1894) and World Bank Operational Directive 4.30 on Involuntary Resettlement (1990).	Pakistani Land Acquisition Act and World Bank Operational Directive OD 4.30 on Involuntary Resettlement: The Ghazi Barotha Dam	Pakistan
Monetary Benefit sharing	58	Monetary compensation Livelihood restoration and enhancement Community development	Treaty for the Joint Development and Utilisation of the Resources of the Komati Basin between South Africa and Swaziland (1992). Komati River Basin Development Project, Phase 1B: Maguga irrigation dam and associated infrastructure, Resettlement and Compensation Policy (1996).	Maguga Dam	Swaziland and South Africa
	59	Revenue transfers from the power sector to central government, regional and local authorities	Brazilian Legislation on revenue transfers from the power sector to the Federal Government, States and Municipalities Itaipu Treaty (1973) Constitution of the Federal Republic of Brazil (1988) Law 7990 (1989) Law 8001 (1990) Law 9433 (1997) Law 9984 (2000)	Itaipu Project (1980)	Brazil and Paraguay

Issues	#	Sub-issue	Framework	Example of Implementation	Country
Monetary Benefit sharing	60	Revenue sharing Development fund	Columbia Basin Trust	Duncan (1968), Keenleyside (1969) and Mica (1975) dams, Columbia	Canada
	61	Equity sharing	Hydro-Québec approach on partnership with indigenous and with local communities	Minashtuk (2000)	Canada
	62	Equity sharing Revenue sharing	Hydro-Québec approach on partnership with indigenous and with local communities	Toulnoustou Dam and three partial river diversions (2005)	Canada
	63	Revenue sharing Development fund	Paix des Braves Agreement between Cree Indigenous communities and the Québec Government (Canada)	Eastmain-1 Dam (2007) and Eastmain-1-A and Rupert Diversion Project (2011)	Canada
	64	Revenue sharing Development fund Preferential electricity rates	Chinese legislation on post resettlement and rehabilitation for hydropower projects Land Administration Law (1986) Regulation on later stage support fund (1991, revised in 1996)	Shuikou Project (1996)	China
	65	Equity sharing	Western region development program (China)	Hydropower Development in Poor Areas of Hubei (first unit commissioned in 2005)	China
	66	Revenue transfers from the power sector to regional and local authorities	Colombian legislation on the management of the environment and renewable resources in Colombia and on revenue transfers from the Electricity Sector to regional environmental agencies and municipalities (Law 99 of 1993 and Decree 1933 of 1994).	Urrá 1 Project (2000)	Colombia
	67	Partnership agreement using equity sharing	Proyecto Hidroamazónico (PROHA) (bi-national agreement between the governments of Germany and Ecuador)	Jondachi Hydroelectric Project (planning stage)	Ecuador
	68	Development fund	Treaty between Lesotho and the Republic of South Africa on Lesotho Highlands Water Project (October 1986) Lesotho Fund for Community Development established through a legal notice in March 1999	Lesotho Highlands Water Project (2004)	Lesotho
	69	Revenue sharing	Nepalese legislation on the payment of royalties to districts and villages: 1992 Electricity Act 1999 Local Self-Governance Act and Local Self-Governance Regulations 2001 Hydropower Development Policy	Kali Gandaki hydropower project (2002)	Nepal
70	Taxes and fees paid to regional and local authorities Equity sharing Property taxes Preferential electricity rates Development fund	Norwegian Legislation Relating to Taxes and License Fees: Industrial Licensing Act No. 16 (1917) Act relating to regulation of watercourses (1917) Act relating to River Systems and Groundwater (2000 Water Resources Act) Power Taxation Act	The Glomma and Laagen River Basin Development (1970s) and the Tokke Hydropower Project (1960s)	Norway	

Issues	#	Sub-issue	Framework	Example of Implementation	Country
Environmental Management Plan	71	Mitigation Measures Social Issues Resettlement Community Development Public Involvement Institutional Arrangements Environmental Management System Monitoring & Auditing	Law No. 4 of 1994 promulgating the Environment Law Executive Regulations to Law 4/1994 (338/1995) OECD DAC. 1992. Guidelines on Aid and Environment: No. 1, Good Practices for Environmental Impact Assessment of Development Projects OECD DAC. 1992. Guidelines on Aid and Environment: No. 3, Guidelines for Aid Agencies on Involuntary Displacement and Resettlement in Development Projects Environment Protection Act, 1973 Water Management Act, 1999	New Naga Hammadi Barrage and Hydropower Plant (Detailed design, tendering, construction, operation)	Arab Republic of Egypt
	72	Mitigation Measures Environmental Flows Catchment/Basin Management Social Issues Public Involvement Institutional Arrangements Environmental Management System Monitoring and Auditing	Environment Protection Act, 1973 Water Management Act, 1999	King River Power Development, Tasmania (Design, Construction, Operation)	Australia
	73	Environmental Flows Institutional Arrangements Environmental Management System Monitoring & Auditing	Environment Protection Act 1997 (ACT) ACT Water Resources Act (1998) Environment Protection and Biodiversity Conservation Act 1999 Utilities Act 2000 (ACT) ISO 14001	ACTEW EMS (Operation)	Australia
	74	Mitigation Measures Environmental Flows Social Issues Resettlement Community Development Public Involvement Institutional Arrangements Environmental Management System Monitoring and Auditing	National Environmental Policy Act, 1981 Subsidiary legislation and regulations	Salto Caxias Hydroelectric Power Plant (Construction, Operation)	Brazil

Issues	#	Sub-issue	Framework	Example of Implementation	Country
Environmental Management Plan	75	Mitigation Measures Environmental Flow Social Issues, Community Development Public Involvement Institutional Arrangements Environmental Management System Monitoring & Auditing	Canadian Environmental Assessment Act (1992) Province of British Columbia's Environmental Assessment Act (1995) ³	Arrow Lakes Generating Station, Province of British Columbia (formerly Keenleyside Powerplant Project) (Planning, design, construction and operation)	Canada
	76	Mitigation Measures Social Issues Public Involvement Institutional Arrangements Monitoring and Auditing Decommissioning	Canadian Environmental Assessment Act (1992) Province of British Columbia's Environmental Assessment Act (2002)	Coursier Dam Decommissioning Project, Province of British Columbia (Decommissioning)	Canada
	77	Catchment/Basin Management Social Issues Public Involvement Institutional Arrangements	Equity Markets Law, 1993 General Financial Institutions Law, 1994	National Water Fund (Operation)	Ecuador
	78	Mitigation Measures Environmental Flows Catchment/Basin Management Social Issues Community Development Public Involvement Institutional Arrangement Monitoring & Auditing	Environment Conservation Act (Act 73 of 1989) National Environmental Management Act (Act 107 of 1998: NEMA) National Water Act (Act 36 of 1998)	Berg Water Project, Western Cape Province (Tender Design, Construction, Operation)	South Africa
	79	Environmental Flows Resettlement Public Involvement Institutional Arrangements Environmental Management System Monitoring and Auditing	National Environmental Act, No 47 of 1980	Kukule Ganga Hydropower Project (Construction)	Sri Lanka
	80	Environmental Flows Social Issues Public Involvement Institutional Arrangements	Water Act (1948, last amended 1994)	Itzhi-Itzhi Dam (Operation)	Zambia

Issues	#	Sub-issue	Framework	Example of Implementation	Country
Compliance	81	Ombudsman Independent Review Mechanism Dispute Resolution Awareness Raising	Chilean law IFC's safeguard policies until the IFC divested from the project in 2002.	Pangue Dam – International Finance Corporation (IFC) and the Office of the Compliance Advisor Ombudsman (CAO) (Construction and post-investment)	Chile
	82	Independent Monitoring Monitoring Plan Panel of Experts Capacity Building	Environment Management Act 2002 (Act No. 5. of 2002 [Swaziland Environment Authority Act 1992 (No. 15 of 1992) (now repealed)] Water Act of 2003 (No. 7 of 2003) Environment Audit, Assessment, and Review Regulations, 2000 (L.N. No. 31 of 2000) 2002 Rural Resettlement Policy 1992 Treaty on the Joint Development and Utilisation of the Water Resources of the Komati River Basin Joint Water Commission Treaty	Maguga Dam Resettlement (Implementation and Operation)	Kingdom of Swaziland South Africa.
	83	Sanctions Debarment Blacklisting	Lesotho National Law. The Project's design, construction, and Implementation are also subject to the World Bank's Safeguard Policies	World Bank Debarment – Lesotho Highlands Water Project (Design, Development, and Operation)	Lesotho
	84	Dispute Resolution International Court	Bilateral treaty between Hungarian People's Republic and the People's Republic of Czechoslovakia for the construction of a series of dams.	Case Concerning the Gabčíkovo-Nagymaros Hydropower Project – International Court of Justice Judgment (Design and Construction)	Slovak Republic Hungary
	85	Awards, Incentives, Stakeholder Involvement	South Africa legal framework Rules of the IAIAsa awards	IAIAsa Premium Award for the Nandoni Dam Relocation Project (Implementation)	South Africa
	86	Management Plan Environmental Management System (EMS) Public Participation Advisory Committee	1998 National Water Act Agreement between ESKOM and Department of Water Affairs and Forestry for the Ownership and Commercial Operation of Palmiet Pumped Storage Scheme (May 1998) Draft "Palmiet River System Operating Rules" ISO 14001	Palmiet Pumped Storage Hydropower Station (Design, Construction, and Operation)	South Africa
	87	Independent Review Mechanism Dispute Resolution	Ugandan law. World Bank's safeguard policies.	Bujagali Dam – World Bank Inspection Panel (Design, Appraisal, Financing)	Uganda
	88	Financial Assurance (including Performance Bonds) Compensation	Primarily state law (the laws and regulations of New Mexico, USA) and secondarily U.S. Federal law	Iyrone Copper Mine – Financial Assurance for Mine Reclamation (Operation)	USA
	89	External Review Mechanism Public Participation	United States Federal law, Washington state law, and the 1909 Boundary Waters Treaty (Canada-United States of America)	International Joint Commission (IJC) Oversight of the Zosel Dam (Design, construction, and operation)	USA
	90	License Provisions Adaptive Management Participatory Processes External Review Body	Federal Power Act, as amended by the Electric Consumers Protection Act of 1986 Endangered Species Act Clean Water Act National Environmental Policy Act National Historic Preservation Act Montana Major Facility Siting Act	Clark Fork Project (Relicensing and operation)	USA

Issues	#	Sub-issue	Framework	Example of Implementation	Country
Compliance	89	Certification External Review Mechanism Economic Incentives	U.S. Federal Law Federal Power Act, as amended by the Electric Consumers Protection Act of 1986 LHl certification criteria	Tapoco Project (Operation)	USA
	90	License Conditions Ownership Structure Joint Relicensing License Amendments Implementation Committees Funds Implementation Plan Adaptive management	U.S. Federal Law, Administered by the Federal Energy Regulatory Commission (FERC)	Pelton Round Butte Project (Relicensing and operation)	USA
	91	Trust Funds Implementation Plans Adaptive Management Advisory Committees Compliance Report	U.S. Federal Law Administered By The Federal Energy Regulatory Commission (Ferc) The 1909 Boundary Waters Treaty Administered By The International Joint Commission (IJC) Operation	St. Lawrence-FDR Power Project (Operation)	USA
	92	Community Monitoring Independent Monitoring Public Participation Technological Innovation Enforcement Information to Facilitate Compliance Capacity Building	U.S. federal law and the Project's license that incorporates a settlement agreement among interested parties.	North Umpqua Stranding Watch (Operation)	USA
	93	Sanctions Fines Civil Enforcement Awareness Raising Compliance Order	Federal Power Act, as amended by the Electric Consumers Protection Act of 1986	FERC Civil Enforcement – American Energy, Inc. Hydropower Projects (Operation)	USA

Issues	#	Sub-issue	Framework	Example of Implementation	Country
Compliance	94	Dispute Resolution National Courts Transboundary Access to Courts, Access to Justice Intervention by NGOs Public Interest Litigation	The normative framework for this case study is United States federal law, including the Federal Power Act, the Wild and Scenic Rivers Act, and the National Environmental Policy Act. The 1909 Boundary Waters Treaty between Canada and the United States also governs. Particularly important in both are the provisions relating to public access to courts.	The High Ross Dam Controversy (Swinomish Tribal Community v. Federal Energy Regulatory Commission, United States Court of Appeals, District of Columbia Circuit) (Operation, but partly suspended in accordance with a negotiated settlement agreement)	USA
	95	International community/actors: UN bodies, donors. Nature of involvement of the international community: Financial: grants; technical assistance. International framework referred to: International principles, outcomes of international conferences, UN international convention, not in effect yet.	SADC Revised Protocol on Shared Watercourse Systems, August 2000	Zambezi SADC (Southern African Development Community) (Policy)	Angola Botswana Malawi Mozambique Namibia Tanzania Zambia Zimbabwe
International Policy for Shared River Basin	96	International community/actors: UN bodies, donors and multilateral development banks (through GEF). Nature of involvement of the international community: Financial (grants), technical assistance. International framework referred to: International principles	Treaty of the La Plata Basin, signed by Argentina, Bolivia, Brazil, Paraguay and Uruguay, 23 April 1969	Corpus Itaipu Agreement, Paraná River (Corpus Christi Dam: project planning. Itaipu Dam: operation)	Argentina Brazil Paraguay
	97	International community/actors: UN bodies. Nature of involvement of the international community: Neutral mediator / facilitator. International framework referred to: International principles.	Treaty of Friendship, Cooperation and Peace between the Republic of India and the People's Republic of Bangladesh, 19 March 1972. A Partial Accord for the test running of the Farakka feeder canal through diversion of waters from the Ganges, 18 April 1975. Agreement between the Government of the Republic of India and the Government of the People's Republic of Bangladesh on Sharing of the Ganga Waters at Farakka and on Augmenting its Flows, 7 November 1977. Indo-Bangladesh Memorandum of Understanding on the sharing of the Ganges, 7 October 1982. Memorandum of Understanding, 22 November 1985. Treaty between the Government of the Republic of India and the Government of the People's Republic of Bangladesh on Sharing of the Ganga/Ganges Waters at Farakka, 12 December 1996.	Ganges River (Implementation)	Bangladesh India

Issues	#	Sub-issue	Framework	Example of Implementation	Country
International Policy for Shared River Basin	98	International community/actors: UN bodies, donors, multilateral development banks. Nature of involvement of the international community: Financial, technical assistance, neutral facilitator. International framework referred to: International principles.	Nile Basin Initiative Act, 2002	Nile Basin Initiative (Project planning and implementation)	Burundi DR of Congo Egypt Eritrea Ethiopia Kenya Rwanda Sudan Tanzania Uganda
	99	International community/actors: UN bodies, donors, multilateral development banks. Nature of involvement of the international community: Financial (grants), technical and managerial assistance.	Establishment of Mekong Committee, 1957 Agreement on the Cooperation for Sustainable Development of the Mekong River Basin, 5 April 1995.	Mekong Hydropower Development Strategy (Strategic planning)	Cambodia Lao PDR Thailand Vietnam China Myanmar
	100	International community/actors: International Court of Justice, governments other than the involved states. Nature of involvement of the international community: Neutral mediator / facilitator. International framework referred to: International principles.	Treaty between the Hungarian People's Republic and the Czechoslovak People's Republic concerning the construction and operation of the Gabčíkovo- Nagymaros System of Locks, 16 September 1977	Gabčíkovo-Nagymaros (Implementation)	Hungary Slovakia
	101	International community/actors: Donors, multilateral development bank. Nature of involvement of the international community: Financial: grants, loans; technical assistance, neutral mediator / facilitator.	Standstill Agreement between the Chief Engineers of East Punjab (India) and West Punjab (Pakistan), 20 December 1947. Delhi Agreement, 4 May 1948. Indus Waters Treaty, 19 September 1960.	Water Resources Management on the Indus Basin (Policy, development and operation)	India Pakistan
	102	International community/actors: UN bodies, donors. Nature of involvement of the international community: Financial (grants), technical assistance.	Agreement between the Government of India and the Government of Nepal on the Kosi Project, 25 April 1954. Revised Agreement between the Government of India and the Government of Nepal on the Kosi Project, 1966.	Kosi Project on Kosi River (Operation)	India Nepal
	103	International community/actors: UN bodies, donors, multilateral development banks. Nature of involvement of the international community: Financial (grants, loans).	Sarada Treaty, Letters of Exchange dated 23 August 1920 and 12 October 1920. Memorandum of Understanding on Tanakpur Barrage Project, 6 December 1991. Treaty between His Majesty's Government of Nepal and the Government of India concerning the Integrated Development of the Mahakali River including Sarada Barrage, Tanakpur Barrage and Pancheshwar Project, 12 February 1986.	Mahakali River (Implementation)	India Nepal
	104	International community/actors: multilateral development banks. Nature of involvement of the international community: Financial (loans)	Agreement between His Majesty's Government of Nepal and the Government of India on the Gandak Irrigation & Power Project, Kathmandu, 4 December 1959. Exchange of letters between the Government of India and His Majesty's Government of Nepal regarding amendment to the Gandak project agreement, Kathmandu, 30 April 1964	Gandak Project on Gandaki/Gandak River (Operation)	India Nepal
	105	International Policy in International Rivers International community/actors: UN bodies, donors, multilateral development banks. Nature of involvement of the international community: Financial (grants, fund), technical assistance. International framework referred to: International principles.	Agreement on Cooperation in the Management, Utilization and Protection of Water Resources in Interstate Sources, 18 February 1992	Aral Sea Basin (Implementation)	Kazakhstan Kyrgyz Republic Tajikistan Turkmenistan Uzbekistan

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**Statement from some civil society advocacy groups and people's movements
involved in the DDP process**

We are very disappointed with the DDP Compendium. It has not taken advantage of input from people directly affected by the projects that are used as case studies and instead relies almost exclusively on documents from agencies and companies involved in dam development.

The disregarding of the perspectives of dam-affected people is particularly frustrating as the Compendium comes at the end of a decade-long process started by the World Commission on Dams, the single most important feature of which was its efforts to listen to the opinions of all stakeholders.

The WCD report itself contains numerous relevant findings on the outcomes of existing practices, and recommendations for how these practices need to be improved. Sadly much of the important work of the WCD goes ignored in the Compendium.

The Compendium makes the fundamental error of assuming that what is written on paper in planning documents is what actually happens in the real world. In big-dam projects even seemingly comprehensive plans often make little difference to outcomes. What actually happens is dictated by political interests and realities on-the-ground that are invariably detrimental to the interests of affected communities and the environment.

We disagree strongly with the implication in the Introduction that small-scale water and energy infrastructure is only complementary to the construction of mega-projects. Small-scale, decentralized projects are frequently superior in benefits and lower in costs and yet receive only a fraction of the investments showered on large projects. It will only be possible to meet the Millennium Development Goals for poverty alleviation and access to water if investments are redirected to a "soft path" centered on small-scale decentralized projects.

Because of its systematic bias and flawed research methodology, the Compendium unfortunately fails to discuss many of the innovative approaches to water and energy sector development that effectively reduce poverty while protecting the environment.

Shripad Dharmadhikary, Manthan Resource Centre, India

Patrick McCully, International Rivers Network, USA

Dinesh Kumar Mishra, Barh Mukti Abhiyan, India

Hope Ogbeide, Society for Water and Public Health Protection/African Rivers Network, Nigeria

Himanshu Thakker, South Asia Network on Dams, Rivers and People, India