

Chapter 9:

Criteria and Guidelines – Applying the Strategic Priorities



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DAMS AND DEVELOPMENT:
A NEW FRAMEWORK FOR DECISION-MAKING
THE REPORT OF THE WORLD COMMISSION ON
DAMS

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Many technical guidelines for the construction of dams and their associated infrastructure have been developed by professional technical networks to ensure high engineering and quality standards. What is lacking is a comprehensive and integrated framework for decision-making on the provision of water and energy services. The Commission's contribution is to provide a framework that emphasises a structured process incorporating the full range of social, environmental, technical, economic and financial criteria and standards.

The framework is built upon the seven strategic priorities described in Chapter 8 and derives its strength from recognising the rights and assessing the risks of all stakeholders in the process.

Social, environmental, governance and compliance aspects have been undervalued in the past. It is here that applying the Commission's proposals will make a difference. The framework identifies key decision points and incorporates associated criteria that translate the Commission's policy principles into a programme for implementation. Within this framework the Commission proposes a set of *guidelines* firmly anchored in examples of good practice from the Knowledge Base to describe how its policy principles can be realised. These guidelines add to existing decision-support

instruments and should be incorporated by governments, professional organisations, financing agencies, civil society and others as they continue to improve their own relevant guidelines and policies over time (see Figure 9.1).

This chapter shows how implementing a decision-making process based on the Commission approach will safeguard rights, reduce the risk of conflicts emerging, and lower overall costs. The framework provides the opportunity for agencies and communities to screen out unfavourable alternatives at an early stage. It is intended to open channels of dialogue between stakeholders, increase mutual understanding and help decision-makers, practitioners and affected people assess whether needs have been adequately addressed. Proposals for dam

projects that emerge from the screening process will have greater public acceptance.

Figure 9.1 WCD Criteria and Guidelines strengthen other decision support instruments



Turning the strategic priorities and their underlying policy principles into reality requires a new focus for planning and management in the water and energy sectors. This chapter concentrates on what needs to change in the way water and energy management plans are developed and projects are designed and implemented. Bringing about this change will require:

- planners to identify stakeholders through a process that recognises rights and assesses risks;
- States to invest more at an earlier stage to screen out inappropriate projects and facilitate integration across

sectors within the context of the river basin;

- consultants and agencies to ensure outcomes from feasibility studies are socially and environmentally acceptable;
- the promotion of open and meaningful participation at all stages of planning and implementation, leading to negotiated outcomes;
- developers to accept accountability through contractual commitments for effectively mitigating social and environmental impacts;
- improving compliance through independent review; and
- dam owners to apply lessons learned from past experiences through regular monitoring and adapting to changing needs and contexts.

The changes will involve reform of existing planning processes and an emphasis on the key stages where decision-makers and stakeholder groups can verify compliance. Among the multitude of decisions to be taken, five critical decision points have been identified as having a particularly strong influence on the final outcome. The first two relate to water and energy planning, leading to decisions on a preferred development plan.

1. Needs assessment: validating the needs for water and energy services.
2. Selecting alternatives: identifying the preferred development plan from among the full range of options.

Where a dam emerges from this process as a preferred development alternative, three further critical decision points occur.

3. Project preparation: verifying that agreements are in place before tender of the construction contract.

4. Project implementation: confirming compliance before commissioning.
5. Project operation: adapting to changing contexts.

The contractual steps of signing agreements and issuing licences are located within this overall framework. Although in these latter stages the Commission has focused on issues related to dam projects, the principles and general guidance presented here are also relevant to non-dam options for water and energy services.

The five decision points are supported by a set of *key criteria* that describe the processes required for compliance. The criteria are presented in the form of checklists for each decision point that provide a clear and open mechanism for determining whether the Commission's recommendations have been followed and the process can proceed to the next stage of planning or implementation.

The criteria cover the full planning and project cycles and include aspects related to existing dams. There are also many dams currently in the planning, design, or construction stage. These 'dams in the pipeline' should also be assessed to identify improvements that can be made. Practical steps are proposed to determine the extent to which such current projects comply with the Commission's recommendations, and to identify how any needed adjustments can be made.

Recognising that guidelines are available from other sources, the Commission focused principally on what needs to be done differently. Introduction of a new decision-making framework through appli-

Five critical decision points have been identified as having a particularly strong influence on the final outcome. They are supported by a set of key criteria that describe the processes required for compliance.

cation of the criteria and guidelines will add significant value to existing processes and form a basis for good practice in water and energy resource development. Taken together, the criteria and guidelines will improve development outcomes and minimise problems encountered in the past.

Five Key Decision Points: The WCD Criteria

As noted, the Commission has identified five key stages and associated decision points for the energy and water sector. The most fundamental of these is selection of the preferred development plan. This determines what options will be pursued to meet needs and whether or not a dam is to be built. This decision is only taken after needs and the available options to meet those needs have been fully assessed. Each of the five stages requires a commitment to agreed procedures culminating in a decision point that governs the course of future action and allocation of resources (see Figure 9.2). At each decision point it is essential to test compliance with preceding processes before giving authority to proceed to the next stage. These points are not exhaustive, and within each stage many other decisions are taken and agreements reached. The five key stages and associated decision points are generic and need to be interpreted within the overall planning contexts of individual countries.

1. *Needs assessment: validating the needs for water and energy services.* Confirmation is required that plans for water and energy development reflect local and national needs adequately. An appropriate decentralised consultation process is used to validate the needs assessment and modify it where necessary.

2. *Selecting alternatives: identifying the preferred development plan from among the full range of options.* The preferred development plan is selected through a participatory multi-criteria assessment that gives the same significance to social and environmental aspects as to technical, economic and financial aspects and covers the full range of policy, programme, and project options. Within this process, investigations and studies are commissioned on individual options to inform decision-making as required; for example, demand-side management studies or feasibility studies.

Where a dam emerges as a preferred option, the following key decision points occur for project preparation, implementation and operation.

3. *Project preparation: verifying agreements are in place before tender of the construction contract.* The preparation stage covers detailed planning and design. Licences issued for development of a project incorporate any conditions that emerge from the options assessment process. Tendering the construction contract is conditional upon reaching negotiated agreements for benefit-sharing mechanisms and for mitigation, compensation, development and compliance measures, in addition to technical requirements.

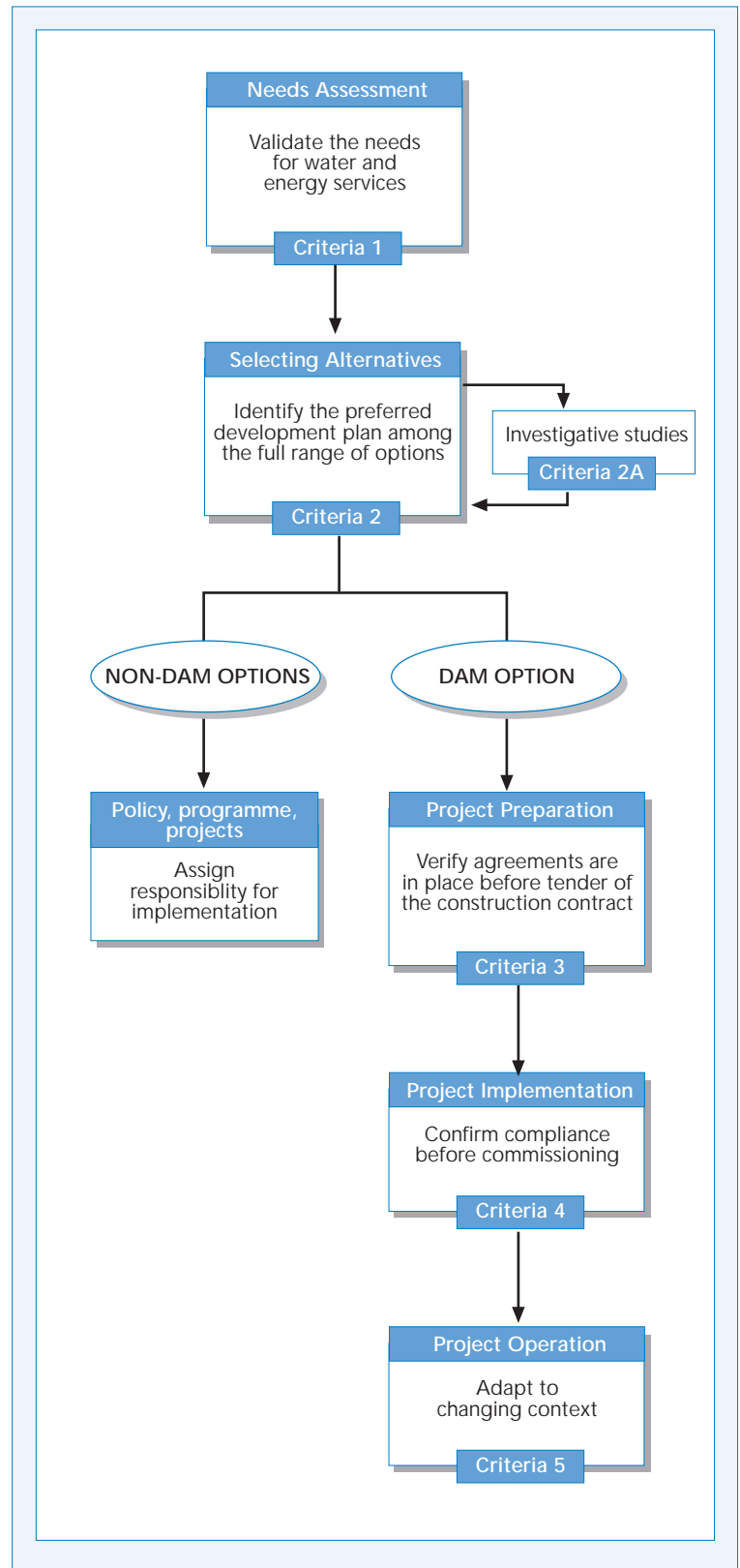
4. *Project implementation: confirming compliance before commissioning.* The implementation stage covers procurement and construction. Issuing the licence to operate is contingent on implementation of specific benefit sharing and mitigation measures at various stages through the implementation period. Compliance with all relevant time-bound commitments is required before commissioning the project.

5. *Project operation: adapting to changing contexts.* Any decisions to modify facilities, operating rules, and licence conditions to meet changing contexts are based on a participatory review of project performance and impacts.

The five key stages and decision points provide a framework within which decision-makers and stakeholder groups can be assured of compliance with agreed procedures and commitments. The benefits of this approach include lowering risks to livelihoods and cost escalation, reducing the number of disputes, and encouraging local ownership. In the short term, additional financial resources for needs and options assessment will be required to achieve compliance with the Commission's policy principles, and efforts will be required to strengthen institutional capacity. In the longer term, the potential exists for major cost savings and increased benefits.

The remainder of this chapter describes each of the five key decision points and provides a related list of criteria for checking compliance. Stakeholder involvement is central to these processes. The composition of a forum of stakeholder groups associated with each stage is different and evolves throughout the process (see Guideline 1: *Stakeholder Analysis*).

Figure 9.2 Five key decision points in planning and project development



Stage 1: Needs assessment: validating the needs for water and energy services

Intended outcome

A clear statement of water and energy services needs at local, regional, and national levels that reflects decentralised assessments and broader national development goals. An assessment based on participatory methods appropriate to the local context resulting in a clear set of *development objectives* that guide the subsequent assessment of options.

Determining needs and setting priorities between and within sectors are continuous processes specific to individual countries. The Commission's policy principles describe characteristics that should be reflected in such processes and define a shift in emphasis to more open and inclusive procedures. Country-level responses are required to ensure that priority setting embodies a fair representation of basic water and energy needs and provides the appropriate balance between local and national demands.

A country's policy framework for water, energy, social issues and the environment guides the whole planning process. The open and participatory approach to needs and options assessment envisaged by the Commission requires a review of these policies to identify and address elements that may hinder its implementation.

The primary influence defining a country's portfolio of development activities, is a set of development objectives that may be embodied in a five-year plan or in a regulatory planning framework. Ensuring that the outcome of the needs assessment for water and energy services reflects stakeholder priorities requires an entry point early in the planning process. The Commission proposes a validation process to confirm the setting of

priorities and the formulation of development objectives.

An open and decentralised planning process provides opportunities for public scrutiny. In situations where this has not been implemented, a programme of national and sub-national public hearings, targeted community consultations, and field surveys can assess the validity of the needs assessment. The subject of the consultations may relate to an overall development strategy, master plan, sector plan, or basin plan, and the breadth of consultation can be determined accordingly. The WCD Knowledge Base demonstrates the need for such a review, since plans are often narrowly focused, reflect social and environmental impacts inadequately, are weak in identifying affected groups, and fail to deal adequately with the distribution of costs and benefits.

In countries where a large proportion of the population does not have access to basic services, a key parameter in the validation process should be the extent to which basic human needs will be met. To ensure that these needs are given prominence, the process of validation should empower those who are least able to influence planning systems.

Responsibility for this validation process rests with the State. Independent facilitation for consultations and surveys and the presence of civil society groups will enhance confidence that the needs of disadvantaged groups are being considered. Briefing materials, records of meetings, and results of the overall process should be available in appropriate languages. If the development objectives are not confirmed by the validation exercise, they should be reviewed and updated using processes consistent with the Commission's policy principles.

Stage 1 Criteria Checklist

NEEDS ASSESSMENT

Selecting alternatives

Project Preparation

Project Implementation

Project Operation

Needs assessments may have been conducted through a range of processes including national, regional, sector-specific, or basin-wide plans. The verification process to be applied will need to be tailored to suit the particular circumstances.

Gaining Public Acceptance

- A consultation plan was developed using a stakeholder analysis to define the groups involved. The plan defines mechanisms for verifying needs at the local, sub-national and national level (Guideline 1).
- Verification of the needs for water and energy services was achieved through a process of public consultation and the results of public consultation were disseminated to stakeholders.
- Development objectives reflect a river-basin-wide understanding of relevant social, economic, and environmental values, requirements, functions, and impacts that identifies synergies and potential areas of conflict.
- An appropriate process was established to address any disparities between the needs expressed through the public consultations and the stated development objectives.

Comprehensive Options Assessment

- Legal, policy and institutional frameworks were reviewed and any bias against resource conservation, efficiency and decentralised options, and any provisions that hindered an open and participatory assessment of needs and options were addressed.

Addressing Existing Dams

- Outstanding social and environmental impacts from past projects were evaluated and incorporated into the needs assessment (see Chapter 8, policy principle 3.3).

Sustaining Rivers and Livelihoods

- Ecosystem baseline studies and maintenance needs were assessed at a strategic level (Guidelines 14, 15)

Stage 2: Selecting alternatives: identifying the preferred development plan

Intended outcome

A mix of alternatives that reflects the needs and meets the *development objectives* has been selected through a multi-criteria assessment of the full range of policy, programme, and project alternatives and included in a preferred *development plan*.

A major concern about past projects is that too limited a range of options was considered before deciding to construct a dam. To address this, the inventory of options must respond to the agreed development objectives (Stage 1) and explicitly identify the beneficiary groups. The inventory of options needs to be sufficiently diverse in terms of policy, programme, and project alternatives, project scale, and geographic coverage.

Strategic impact assessments provide an initial level of screening to remove alternatives that have unacceptable social and environmental consequences. They need to reflect the importance of avoiding adverse impacts and the precautionary approach. The assignment of relative weights to designate the importance of various parameters should be a participatory process and form the basis of a multi-criteria analysis to screen and rank alternatives. For example, the gestation period in delivering benefits, the scale of adverse impacts and costs are all key considerations.

The information available on each option will not be at the same level of detail. Decisions need to be taken during the screening process on whether to commission further investigations and studies on individual alternatives, while at the same time not jeopardising or delaying alternatives

that can deliver benefits within the short-term.

Studies are required to assess the extent to which policy and programme options can meet the development objectives. The policy principles cover a number of such areas, including:

- optimising existing investments by increasing operational efficiency and improving productivity;
- demand-side management assessment;
- decentralised supply options and community-level initiatives; and
- policy and institutional reforms.

Some options will need reconnaissance, pre-feasibility, and feasibility studies appropriate to the stage in the process and incorporating social and environmental surveys and impact assessments. The decision to allocate financial resources to such studies should be taken within the overall context of the options assessment process. For example, it may have been agreed that detailed investigations of supply-side approaches should await the outcome of demand-side studies that could influence the scale of any project intervention.

Criteria relevant to project-related studies are described as a subset of the process of selecting alternatives (see Stage 2A). The findings of the studies are fed back into the screening process for consideration with all other remaining options. This approach deviates from existing practice in many countries by cutting the direct link between the feasibility study and project approval. It encourages a broader consideration of all feasible options in setting priorities.

Stage 2 Criteria Checklist

| Needs Assessment | SELECTING ALTERNATIVES | Project Preparation | Project Implementation | Project Operation |
|--|------------------------|---------------------|------------------------|-------------------|
| <div data-bbox="196 410 573 446" data-label="Section-Header"> <h3>Gaining Public Acceptance</h3> </div> <div data-bbox="196 455 816 872" data-label="List-Group"> <ul style="list-style-type: none"> ■ Stakeholders participated in creating the inventory of options, assessing options, and in negotiating those outcomes that may affect them (Guidelines 1, 2). ■ An agreed dispute resolution mechanism for negotiated processes was established with the participation and agreement of stakeholders (Guideline 2). ■ Indigenous and tribal peoples gave their free, prior and informed consent to the inclusion in the development plan of any planned option that would potentially affect them (Guideline 3). </div> <div data-bbox="196 887 708 923" data-label="Section-Header"> <h3>Comprehensive Options Assessment</h3> </div> <div data-bbox="196 932 816 1761" data-label="List-Group"> <ul style="list-style-type: none"> ■ Strategic impact assessments and life cycle analysis were integrated and undertaken as an initial step in the process (Guidelines 4, 7, 8, 14, 17). ■ A multi-criteria assessment was used to screen and select preferred options from the full range of identified alternatives (Guideline 6). ■ The screening of options: <ul style="list-style-type: none"> ■ covered all policy, programme, and project alternatives; ■ gave social and environmental aspects the same significance as technical, economic and financial factors; ■ gave demand-side options the same significance as supply options; ■ prioritised consideration of improving performance of existing systems; ■ considered river-basin-wide aspects and cumulative impacts; ■ took account of potential changes in climate; and ■ reflected the precautionary approach. ■ Distributional and risk analyses were conducted at an appropriate level (Guidelines 9, 11) and environmental and social impacts were valued where appropriate (Guideline 10). </div> <div data-bbox="885 410 1516 589" data-label="List-Group"> <ul style="list-style-type: none"> ■ Approval to proceed with any project-level investigations was informed by a comprehensive assessment of options (see Criteria Checklist 2A). ■ Rejection of any options was explained in an open and timely manner. </div> <div data-bbox="885 602 1256 638" data-label="Section-Header"> <h3>Addressing Existing Dams</h3> </div> <div data-bbox="885 646 1516 749" data-label="List-Group"> <ul style="list-style-type: none"> ■ Provisions were made for resolving outstanding social and environmental impacts (see Chapter 8, policy principle 3.3) </div> <div data-bbox="885 759 1357 798" data-label="Section-Header"> <h3>Sustaining Rivers and Livelihoods</h3> </div> <div data-bbox="885 804 1521 1149" data-label="List-Group"> <ul style="list-style-type: none"> ■ An established policy exists to maintain selected rivers with high ecosystem functions and values in their natural state. ■ Consideration of options took into account: avoiding dams on the main-stem of rivers wherever possible; avoiding or minimising negative impacts on endangered species, ecosystems, livelihoods, human health and cultural resources; and respecting the provisions and guidance of relevant international treaties. </div> <div data-bbox="885 1161 1427 1234" data-label="Section-Header"> <h3>Recognising Entitlements and Sharing Benefits</h3> </div> <div data-bbox="885 1242 1484 1410" data-label="List-Group"> <ul style="list-style-type: none"> ■ For any project option, stakeholders negotiated the guiding principles and criteria for: benefit-sharing, mitigation, resettlement, development and compensation measures (Guidelines 2, 18, 20). </div> <div data-bbox="885 1423 1187 1461" data-label="Section-Header"> <h3>Ensuring Compliance</h3> </div> <div data-bbox="885 1468 1502 1570" data-label="List-Group"> <ul style="list-style-type: none"> ■ Sufficient institutional capacity exists, or will be enhanced, to monitor and enforce commitments for social and environmental components. </div> <div data-bbox="885 1583 1510 1655" data-label="Section-Header"> <h3>Sharing Rivers for Peace, Development and Security</h3> </div> <div data-bbox="885 1661 1513 1766" data-label="List-Group"> <ul style="list-style-type: none"> ■ Any objections from riparian states were resolved through good faith negotiations or independent dispute resolution procedures (Guideline 26). </div> | | | | |

Stage 2A: Investigative studies

The authority to proceed with a preparatory study for a dam project should not be a signal that the project will be implemented. Rather, such a decision should be integrated into the overall options assessment process. This will provide a break in the traditional planning cycle to encourage more open decision-making. Viewing project options within the overall framework of options assessment also facilitates the rejection of projects that fail to meet social and environmental objectives in favour of better alternatives. The WCD Knowledge Base has demonstrated that more rigorous estimates of project costs are also required as a part of such studies, and the risk of cost overruns must be fully considered in the assessment process.

Meaningful participation in preparatory studies is central to the success of the investigation and the ultimate outcome. Careful analysis to recognise the rights and assess the risks of stakeholder groups is essential. A forum of stakeholder groups needs to be identified based on project boundaries. Agreement on the participatory elements of the studies should be formalised in a consultation plan.

The strategic impact assessment undertaken early in the options assessment will have outlined the key unknowns and the areas to be investigated across all sectors. The issues will be defined in more detail in the scoping stage of project-related impact assessments. On this basis, terms of reference and work plans for the diverse range of sector specialists can be integrated. Project-related impact assessments have to go beyond environmental and social impact assessments to include health and cultural impacts. To be effective, they require an improved level of baseline studies.

Preliminary negotiations with project-affected people, their community representatives, and other stakeholders are central to the preparatory studies in considering mitigation measures for any unavoidable adverse impacts and investigating benefit-sharing plans. By the time a study reaches feasibility stage, the scope of such measures should be clearly defined in order to reduce the likelihood of protracted negotiations and a breakdown of discussions later in the process. 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.

Ultimately the results of the study, including any outstanding issues, will be fed back into the screening and ranking exercise (see Criteria Checklist 2) for comparison with remaining alternatives prior to any decision to proceed further with detailed project development. The following plans, with indicative budgets, need to be developed as a minimum requirement to act as a foundation for any further project planning:

- an outline environmental management programme, including provision for an environmental flow to maintain downstream ecosystems;
- an outline social mitigation, resettlement, and development plan; and
- an outline monitoring plan, including outcome-based indicators.

A compliance plan will be required to cover these aspects and other regulatory requirements throughout subsequent stages of project planning, development, and operation.

Stage 2A Criteria Checklist

Needs Assessment

SELECTING ALTERNATIVES

Project Preparation

Project Implementation

Project Operation

Project-related pre-feasibility and feasibility studies need to meet the following criteria. Policy and programme related studies may also be required, and are covered in Criteria Checklist 2.

Gaining Public Acceptance

- Stakeholders participated in baseline, impact and investigative studies and the negotiation of outcomes that potentially affect them (Guidelines 1, 2, 14, 17).
- The studies and impact assessments were open and independent, and were preceded by a participatory scoping phase (Guideline 5).

Comprehensive Options Assessment

- The investigations were analysed on a river-basin-wide understanding of social, economic, and environmental values, requirements, functions, and impacts including cumulative impacts, and the precautionary approach was applied. (see Guideline 5).
- The recommendations of studies undertaken on resource conservation measures, demand-side management, local supply-side options and improvement of existing systems were reflected in the demand forecast for the sector.
- Within-project alternatives were assessed using a multi-criteria approach (Guideline 6).

Addressing Existing Dams

- Studies examined possible synergies from interactive operation of related water resource infrastructure in the basin.

Sustaining Rivers and Livelihoods

- An environmental flow requirement to maintain downstream species, ecosystems and livelihoods was defined (Guideline 15).

- Impacts on fish have been assessed and measures to avoid or minimise impacts were considered, including an effective fish pass where feasible (Guideline 16).

Recognising Entitlements and Sharing Benefits

- Stakeholders negotiated agreements for compensation, mitigation, resettlement, development and monitoring measures affecting them, including draft contracts where necessary (Guideline 19).
- Effective benefit-sharing strategies were identified and agreed with people adversely affected by the project (Guideline 20).

Ensuring Compliance

- Institutional capacity to monitor and enforce commitments for social and environmental components of the project was analysed and measures to strengthen capacity identified.
- An independent panel reviewed the assessment of impacts and the planning of social and environmental mitigation plans (Guideline 22).

Sharing Rivers for Peace Development and Security

- Riparian states were notified of options affecting them and agreed procedures for impact assessments. Objections were addressed through good faith negotiations and agreed dispute resolution procedures (Guideline 26).

Stage 3: Project preparation: verifying commitments are in place before tender of the construction contract

Intended outcome

Clearance to tender the construction contract is given by the relevant authority and includes conditions for the award of the contract and operations. Mitigation and monitoring measures are formalised into contracts between responsible parties, and compliance arrangements are in place.

The Commission considers that all large dams should have time-bound licences. Where a large dam emerges as a preferred option, a licence for project development should be issued to the developer by the appropriate regulatory agency. Project preparation continues with detailed planning and design stages, including drafting of tender documents and plans for benefit-sharing and mitigation. Adaptation of the criteria described here may be necessary where the design and construction are part of a single package.

Negotiations with all project-affected people, their community representatives, and other stakeholders will continue in good faith based on the outline agreements reached during the feasibility stage. They would cover all environmental and social plans; development programmes, including benefit-sharing plans; and construction-related issues. A clear agreement with the affected people on the sequence and stages of resettlement will be required before construction on any project preparatory works begins, such as access roads or river diversion works. In cases where these negotiations stall, an independent dispute resolution process is required. The negotiated agreements will result in signed contracts between the developer and affected communities and individuals, with clear targets for assessing compliance.

The responsibilities of the developer in relation to mitigation, development of affected communities, and benefit-sharing will be clearly reflected in the licence and the compliance plan. The operation phase should be contingent on compliance with specific commitments identified in the licence. Conditions for impoundment and commissioning should be explicitly stated.

If the tender cost estimate is substantially higher than the feasibility study estimate, the choice of project should be reviewed to see if it still meets the selection criteria. A similar check is required if needs have changed substantially since the outset, or if the project scope has changed materially. If the actual price of the lowest responsive tender exceeds agreed cost limits, procurement should be interrupted and options reviewed.

Social and environmental mitigation measures should be defined in the tender in similar detail to construction elements, namely the 'bill of quantities'. The tender should clearly identify responsibilities of the contractor, the developer, and the government in relation to:

- the environmental management plan;
- measures to mitigate adverse social impacts, including development opportunities for affected communities;
- access to and management of new resources in the reservoir;
- the construction method and schedule, and the construction camp;
- impact monitoring and reporting during the operations stage; and
- compliance instruments.

Stage 3 Criteria Checklist

Needs Assessment

Selecting Alternatives

PROJECT PREPARATION

Project Implementation

Project Operation

Gaining Public Acceptance

- Stakeholders participated in the project design and the negotiation of outcomes that affect them (Guidelines 1, 2).
- Indigenous and tribal peoples gave their free, prior, and informed consent to the project as designed (Guideline 3).

Comprehensive Options Assessment

- The stakeholder forum participated in assessing alternatives for the detailed layout of the dam, associated infrastructure, and its operation.

Addressing Existing Dams

- Cumulative and interactive impacts of existing infrastructure were addressed in the design of the dam and agreements reached with stakeholders and operators to modify operating rules of existing dams where needed.

Sustaining Rivers and Livelihoods

- Acceptable rules were developed for reservoir filling, commissioning and operation.
- The final design includes provisions for emergency drawdown and decommissioning and is sufficiently flexible to accommodate changing future needs and values, including ecosystem needs and ecosystem restoration (Guideline 12).
- An environmental management plan incorporating environmental flows and other mitigation and enhancement measures was agreed with stakeholders and defines monitoring and evaluation programmes.
- The developer provided sufficient evidence to demonstrate that proposed mitigation and development measures will be effective in meeting their objectives.

Recognising Entitlements and Sharing Benefits

- Mitigation, resettlement, monitoring, and development plans were agreed with affected groups, and relevant contracts signed (Guideline 19).
- Detailed benefit sharing mechanisms, and the means to deliver them, have been agreed and set in place with affected groups (Guideline 20).

Ensuring Compliance

- Independent panels reviewed and endorsed mitigation plans (Guideline 22).
- Provisional sums for mitigation are included in the tender, and their financing has been confirmed.
- A Compliance Plan was prepared, presented to the stakeholder forum and formalised. Individual compliance measures include mechanisms for dispute resolution (Guideline 21).
- The developer has allocated funds for an effective monitoring and evaluation system covering project performance, safety and impacts. Institutional capacity exists to monitor and enforce agreements effectively.
- A transparent process for short-listing contractors and selecting tenders is in place and contractors with a record of under-performance or corruption on past projects were identified and debarred where appropriate.
- Relevant performance bonds have been secured, trust funds established and integrity pacts signed (Guidelines 23, 24, 25).
- The licence for project development defines the responsibility and mechanisms for financing decommissioning costs.

Sharing Rivers for Peace, Development and Security

- Resolution was achieved where affected riparian states had outstanding objections (Guideline 26).

Stage 4: Project implementation: confirming compliance before commissioning

Intended outcome

Clearance to commission the project is given by the relevant authority after all commitments are met. Relevant elements of performance bond sureties are released. The operating licence is confirmed, including specific requirements for monitoring, periodic review and adaptive management.

Issuing the licence to operate will be contingent on compliance with mitigation measures in addition to technical requirements. The licence will contain a number of conditions for the operation stage, including compliance with operating rules, public notifications, dam safety, monitoring and periodic review. All contingencies cannot be anticipated, and a balance should be struck on a case-by-case basis between the necessary level of certainty and sufficient flexibility to accommodate open, transparent, adaptive management.

Phasing of resettlement is required where the reservoir is being impounded as the dam is constructed. Special attention is necessary to ensure that compensation and development measures are in place well in advance.

Reservoir filling, commissioning of productive capacity and the initial years of operation are critical phases that require special attention, intensive monitoring and continued dialogue with stakeholder groups. Agreements on operating conditions are required for three stages of commissioning:

- reservoir filling;
- test operation; and
- initial operation.

Full compliance with technical, environmental and social measures must be

achieved before the project is commissioned and enters full operation. This includes the broad commitments of the project developer as laid down in the project licence, compliance plan, and related agreements, as well as the commitments of the contractor acting as agent of the developer. Once the developer has met specified staged commitments, the associated financial sureties of any performance bond or outstanding contractual payments may be released.

Arrangements for public safety must be in place in order to warn the downstream population that sudden releases of water may occur and may be dangerous. Compensation should be paid for any loss of livelihood, such as the loss of fishing opportunities. If test operations cause downstream inconvenience, compensation should also be paid – for example, if a test takes place during the dry season and damages recession agriculture plots.

A range of agreements on initial and long-term operation should be incorporated in the operating licence and provisions for implementation verified. Licence periods should not normally exceed 30 years. They should include:

- agreement on environmental flow releases to the downstream river;
- releases to the downstream river for other functions (navigation, water supply, downstream irrigation);
- operating rules during normal and exceptional floods;
- procedures for opening spillway gates;
- monitoring and publication of relevant operation data; and
- periodic review of operating rules.

Stage 4 Criteria Checklist

Needs Assessment

Selecting Alternatives

Project Preparation

PROJECT IMPLEMENTATION

Project Operation

Gaining Public Acceptance

- Stakeholders participated in monitoring mitigation measures and in negotiating outcomes that affect them (Guidelines 1, 2).
- Consultation mechanisms were agreed in advance with stakeholders for any technical, social, environmental, or other problems that may be encountered during reservoir filling and commissioning.
- Contingency plans for emergency drawdown of the reservoir were agreed with stakeholders before commissioning and were widely disseminated.

Comprehensive Options Assessment

- Affected stakeholders have reviewed any changes proposed to the tender design that substantially affect impacts, mitigation measures, benefit sharing, operational practices, or the monitoring programme.

Addressing Existing Dams

- Institutional co-ordination mechanisms that recognise interactive effects and cumulative impacts are in place to adjust operation of existing dams.

Sustaining Rivers and Livelihoods

- Required environmental mitigation measures were implemented.

Recognising Entitlements and Sharing Benefits

- The mitigation, resettlement and development action plan has been implemented and disputes resolved (Guideline 19).

Ensuring Compliance

- An independent panel reviewed and endorsed implementation of social, environmental, health and cultural heritage mitigation measures (Guideline 22).
- Preparations have been made to implement licence conditions for operations, implement continuing mitigation measures, undertake monitoring and regular evaluation, and disseminate information.
- Monitoring of social, environmental and technical aspects includes an intensive phase to cover the rapid changes that occur in the impoundment and commissioning period.
- The developer has complied with pre-commissioning commitments as defined in the Compliance Plan (Guideline 21).

Sharing Rivers for Peace, Development and Security

- Mechanisms were initiated for sharing monitoring information with riparian provinces or States (Guideline 26).

Stage 5: Project operation: adapting to changing contexts

Intended outcome

Conditions for operating under the licence are fulfilled and the licence conditions modified as necessary to adapt to changing contexts. Monitoring programmes feed back into project operation. A process is initiated to decide on reparations, if necessary.

The objectives of dam management need to be transformed from purely technical to development-oriented goals that include social and environmental considerations. This has major repercussions for operation, monitoring, and evaluation of both existing dams and dams implemented in the future. Adaptive management is needed to continuously assess and adjust operational decisions within the changing context of environmental, social, physical and market conditions. This requires a close relationship between the local community, other stakeholders and dam owners and operators in order to minimise problems and quickly resolve any that do arise.

Monitoring programmes should:

- include a full range of technical, environmental, social, and economic parameters decided openly with the stakeholders;
- have an intensive phase in the first five years, or after a major change in operation;
- feed back into project operations; and
- be available to all stakeholders, perhaps in the form of an annual report.

A comprehensive project evaluation is required three to five years after commissioning and at regular intervals thereafter (every five to ten years is suggested). The evaluation is undertaken by the dam operator but is a stakeholder-driven process and may draw on the Commission's case study methodology.

The evaluations would be:

- comprehensive across all environmental, social, economic, and institutional impacts;
- integrated to cover the interactions between impacts;
- long-term to consider impacts over several decades; and
- cumulative to reflect impacts of other structural and non-structural measures in the basin.

In addition to periodic evaluations, parties other than the dam operator, or exogenous factors may prompt re-planning studies. For example, a strategic or sectoral impact assessment may indicate the need for a re-planning exercise for a group of projects. Licence conditions should make provision for such studies and for any required changes to operating conditions through good faith negotiations that recognise the rights of all parties. Any re-planning studies should be done on the basin level.

Licences should specify transparent processes for stakeholder participation in operations and procedural requirements for monitoring and evaluation, safety inspection, contingency planning and information disclosure. The regulatory authority or responsible government line agency must ensure compliance with provisions of the licence. Non-commercial aspects of the licence should be made public. Re-licensing procedures should examine present-day alternatives and be informed by an integrated review of project performance and impacts. Impact assessments should be undertaken for all major changes including decommissioning where dams are no longer required or are too expensive to maintain.

Stage 5 Criteria Checklist

Needs Assessment

Selecting Alternatives

Project Preparation

Project Implementation

PROJECT OPERATION

These criteria are relevant to both existing dams (Chapter 8, Strategic Priority No.3) and the operational stages of future dams.

Gaining Public Acceptance

- Stakeholders are identified for consideration of operational issues and any proposed changes that impact on them or the environment (Guideline 1).

Comprehensive Options Assessment

- Periodic evaluations of all aspects of project operation and performance are undertaken with the involvement of the stakeholder forum every 5 to 10 years and agreements renegotiated as necessary.
- Modernisation programmes and alternative operational regimes are considered as part of periodic reviews, replanning, or relicensing exercises through a participatory multi-criteria approach (Guideline 13).
- Monitoring and evaluation programmes should explicitly consider the influence of climate change (namely increasing and decreasing rainfall and flows) on benefits and dam safety.
- A full feasibility study, including analysis of alternatives and impact assessment, is undertaken for any proposal for any major physical change, including decommissioning.

Sustaining Rivers and Livelihoods

- Operations take account of environmental flow requirements (quantity and quality) and ecosystem and social impacts are monitored (Guideline 15).

Recognising Entitlements and sharing benefits

- Detailed benefit-sharing mechanisms are modified as necessary with the agreement of affected groups (Guideline 20).

Ensuring Compliance

- Adverse social and environmental impacts and reparations issues are referred to the appropriate recourse body (Guideline 19).
- Annual reports of project monitoring programmes, including social and environmental aspects, are issued promptly and corrective measures are initiated to address issues raised in the reports.
- The requirements of remaining performance bonds or trust funds outlined in the Compliance Plan are periodically reviewed, and financial guarantees are released on satisfactory compliance with agreed milestones (Guideline 23).
- Dam safety and inspection programmes are implemented.

Sharing Rivers for Peace, Development and Security

- Mechanisms exist to share monitoring information and resolve issues as they arise.

A Special Case: Dams in the Pipeline

The strategic priorities and policy principles outlined in Chapter 8 are as relevant to projects already at an advanced stage of planning and development as they are to the selection of a project in the earlier options assessment stage.

Currently a large number of dam projects are at various stages of planning and development.

While acknowledging that delays in implementation can cause unacceptable delays in delivering intended benefits, the WCD Knowledge Base has

demonstrated that it is never too late to improve outcomes. On this basis, the Commission proposes an open and participatory review of ongoing and planned projects to ascertain the extent to which project formulation can be adapted to accommodate the principles outlined in this report.

The essence of the process is that stakeholder groups should have an opportunity to define the scope of the review and to propose changes in keeping with the Commission's recommendations. The extent of any additional study or changes in project configuration would depend on the stage of planning, design, or construction and be determined from a synthesis of the stakeholder consultations and, where appropriate, an inter-ministerial review. General actions to guide the review for all projects would include:

- undertake a stakeholder analysis based on recognising rights and assessing risks to identify a stakeholder forum that is consulted on all issues affecting stakeholders;

- provide support to vulnerable and disadvantaged stakeholder groups to participate in an informed manner;
- undertake a distribution analysis to assess who shares the costs and benefits of the project;
- develop agreed mitigation and resettlement measures to promote development opportunities and benefit-sharing for displaced and affected people;
- avoid, through modified design, any severe and irreversible ecosystem impacts;
- provide for an environmental flow requirement and mitigate or compensate any unavoidable ecosystem impacts; and
- design and implement recourse and compliance mechanisms.

Governments may also use the review of 'dams in the pipeline' as an opportunity to compare the existing policy framework for planning and implementation of water and energy options with the criteria and guidelines proposed by the Commission. This can serve to launch a process of internal review and modification of existing policies and legislation, and reinforcement of appropriate capacity that will facilitate implementation of the Commission's recommendations in future.

At specific stages of planning and project development, regulators, developers and, where appropriate, financing agencies should ensure that the following project-related points are addressed:

Projects at feasibility stage

- The stakeholder forum confirmed that the set of options considered was appropriate, or identified other alternatives to consider as part of the project impact assessment.

The Commission's Knowledge Base has demonstrated that it is never too late to improve outcomes.

- Any bias in selection of alternatives is removed or justified in a transparent fashion (for example subsidies to particular sub-sectors or groups).
- Demonstrated public acceptance exists for the recommended options.
- The assumptions underlying the economic, financial, and risk analysis are justified and subject to sensitivity analysis.
- Mechanisms for benefit-sharing are identified.
- An environmental flow requirement is determined.

Projects at detailed design stage

- The stakeholder forum is consulted on decisions related to project layout, operation and mitigation and development measures and relevant agreements are negotiated with affected groups.
- Environmental flow requirements are determined and incorporated into the design and operation rules.
- A Compliance Plan is prepared, and recourse mechanisms are identified.
- Compliance mechanisms are provided for in tender documents.
- Benefit-sharing contracts are negotiated for displaced and project affected people.
- A process for stakeholder involvement during operation is established.

Projects under construction

- The record of compliance is reviewed and a compliance plan is developed for remaining mitigation measures.
- Existing commitments for resettlement and benefit-sharing are converted into formal contracts.



- An adequate social, environmental and technical monitoring plan is financed by the developer.
- The operating rules and commissioning plan are agreed with a stakeholder forum.
- A comprehensive post-project review is agreed for two to three years after commissioning, and every five to ten years thereafter.

This process of review implies added investigations or commitments, the re-negotiation of contracts and the incorporation of a Compliance Plan. As in the case of initial planning, the additional financial costs incurred will be recouped in lower overall costs to the operator, to government, and to society in general as a consequence of avoiding negative outcomes and conflicts.

Governments may also use the review of 'dams in the pipeline' as an opportunity to compare the existing policy framework for planning and implementation of water and energy options with the criteria and guidelines proposed by the Commission.

A Set of Guidelines for Good Practice

The guidelines outlined here describe in general terms how to assess options and plan and implement dam projects to meet the Commission's criteria. The 26 guidelines add to the wider range of technical, financial, economic, social and environmental guidelines. They are advisory tools to support decision-making and need to be considered within the framework of existing

international guidance and current good practice. Further information is available on many of these aspects in the WCD Knowledge Base.

The guidelines are presented under the same sub headings as the Commission's seven strategic priorities. There are clear linkages between individual guidelines and cross references to them are given in the criteria checklists for the key decision points of the planning and project cycles.

Strategic Priority 1: Gaining Public Acceptance

- 1 Stakeholder Analysis
- 2 Negotiated Decision-Making Processes
- 3 Free, Prior and Informed Consent

Strategic Priority 2: Comprehensive Options Assessment

- 4 Strategic Impact Assessment for Environmental, Social, Health and Cultural Heritage Issues
- 5 Project-Level Impact Assessment for Environmental, Social, Health and Cultural Heritage Issues
- 6 Multi-Criteria Analysis
- 7 Life Cycle Assessment
- 8 Greenhouse Gas Emissions
- 9 Distributional Analysis of Projects
- 10 Valuation of Social and Environmental Impacts
- 11 Improving Economic Risk Assessment

Strategic Priority 3: Addressing Existing Dams

- 12 Ensuring Operating Rules Reflect Social and Environmental Concerns
- 13 Improving Reservoir Operations

Strategic Priority 4: Sustaining Rivers and Livelihoods

- 14 Baseline Ecosystem Surveys
- 15 Environmental Flow Assessment
- 16 Maintaining Productive Fisheries

Strategic Priority 5: Recognising Entitlements and Sharing Benefits

- 17 Baseline Social Conditions
- 18 Impoverishment Risk Analysis
- 19 Implementation of the Mitigation, Resettlement and Development Action Plan
- 20 Project Benefit-Sharing Mechanisms

Strategic Priority 6: Ensuring Compliance

- 21 Compliance Plans
- 22 Independent Review Panels for Social and Environmental Matters
- 23 Performance Bonds
- 24 Trust Funds
- 25 Integrity Pacts

Strategic Priority 7: Sharing Rivers for Peace, Development, and Security

- 26 Procedures for Shared Rivers

Gaining Public Acceptance

1. Stakeholder Analysis

The absolute value and the relative significance of 'stakes' vary, especially in what they represent for the interested party. Stakeholders have unequal power and this can affect their ability to participate in and influence decisions. A stakeholder analysis based on recognising rights and assessing risks should be used to identify key stakeholders for planned activities. The analysis will also seek to understand and address potential factors that may hinder their involvement. The analytic approach can involve stakeholder workshops, community-level surveys, key informant surveys, and literature review.

The stakeholder analysis leads to the constitution of a temporary stakeholder forum as a basis for participation and, where relevant, negotiation processes throughout the planning and project cycles. A stakeholder forum is a dynamic construct and will need to be applied to meet changing needs through the planning and project cycles beginning with needs assessment/verification and options assessment. The composition of a stakeholder forum, the level of representation of various interests, and the means of facilitating the process changes from stage to stage.

The stakeholder analysis will:

- *Recognise existing rights and those who hold them.* Those groups whose livelihoods, human rights and property and resource rights may be affected by an intervention are major rights holders and thus core stakeholders in a stakeholder forum within which negotiated outcomes should be achieved.
- *Identify those at risk* through vulnerability or risk analysis and consider them as core stakeholders, including those who face risk to their livelihoods, human rights, and property and resource rights. Special attention should be given to indigenous and tribal peoples, women and other vulnerable groups as they may face greater risks from development interventions (Guideline 3). In the case of a dam, the analysis should include those upstream, downstream and in the proposed reservoir area. Relevant civil society groups or scientists are included in a stakeholder forum to ensure that environmental risks, for which there may be no champion, are adequately reflected and discussed.
- *Identify constraints to establishing a level playing field for stakeholder involvement.* The use of capacity building, institutional strengthening, quota systems (for example, to ensure proper representation of vulnerable groups such as women), or support mechanisms, such as NGOs or independent facilitators to correct any imbalance of influence should be explored. Financial support may be necessary to ensure adequate participation.

The government planning body sponsoring the planned interventions is responsible for initiating the stakeholder analysis leading to constitution of a forum and will participate in it. The final structure and composition of a stakeholder forum should be decided in a consultative process. The assistance of independent facilitators may be helpful in achieving this outcome.

A stakeholder forum is therefore formed of individuals representing various groups and

interests. Such structures may exist already and their capacity can be strengthened or modified. Where such structures do not exist, a stakeholder forum is established as the representative body of the stakeholders. The extent to which a stakeholder forum should be formalised to enable representation for the groups identified through a rights-and-risks approach will depend on country contexts. The status of a forum, and the selection of its representatives, should however ensure effective participation for all interested and affected parties and accommodate changes over time.

Effective participation in a stakeholder forum must be facilitated through timely access to information and legal and other necessary support. This is particularly the case with indigenous and tribal peoples, women, and other vulnerable groups.

Sufficient time must also be allowed for the wider body of stakeholders to examine information and to consult amongst themselves before decisions are made. Where dispute resolution mechanisms are required for negotiated processes, see Guideline 2.

2. Negotiated Decision-Making Processes

A *negotiation process* is one in which stakeholders – identified through the Stakeholder Analysis (see Guideline 1) – have an equal opportunity to influence decisions. Negotiations should result in demonstrable public acceptance of binding and implementable agreements and in the necessary institutional arrangements for monitoring compliance and redressing grievances. All stakeholder forum members should share a genuine desire to find an equitable solution and agree to be bound by the consensus reached.

Attributes of a fair negotiation process

- *The Representation of Stakeholders* in the stakeholder forum is assured through a free process of selection, ensuring the effective and legitimate representation of all interests.
- *The Integrity of Community Processes* should be guaranteed through assurances that they will not be divided or coerced, recognising that differences and internal conflicts may arise. The process and the stakeholders should be as free as possible from external manipulation. Communities may legitimately decide to discontinue their involvement in the process if their human rights are not respected or in the event of intimidation.
- *Adequate time* is allowed for stakeholders to assess, consult and participate.
- *Special Provisions for Prior Informed Consent*. In negotiations involving indigenous and tribal peoples, mechanisms to resolve disputes should follow procedures recommended by the Commission (Chapter 8, Strategic Priority 1.4 and Guideline 3).
- *Addressing Power Imbalances*. Authorities should make available adequate financial resources to enable stakeholder groups who are politically or financially weak, or who lack technical expertise or organised representation to participate effectively in the process. These resources may include financial support to representatives for logistics, for income foregone, for capacity building and for requesting specific technical advice.

- *Transparency* is ensured by jointly defining criteria for public access to information, translation of key documents and by holding discussions in a language local people can understand.
- *Negotiations are assisted by a facilitator or mediator*, where stakeholders request it, selected with the agreement of the stakeholders.
- guarantee access to all relevant *information* to the stakeholder forum in an appropriate language; and
- at the outset, agree on the *timeframe* for the key milestones within the decision-making process.

For this to be a *legitimate process*, the stakeholders should:

- agree on the appropriate *structures and processes* for decision-making, the required *mechanisms for dispute resolution* (including any third party involvement), and the circumstances in which they will be initiated;
- agree that the *interests* at stake and legitimate community needs are clearly identified, in particular on the basis of relevant rights and risks;
- ensure that the available *alternatives*, their relevant consequences and uncertainties are given full consideration;

Compliance with the process outlined above will be a fundamental consideration in determining whether the negotiations process was conducted in good faith.

When a negotiated consensus cannot be achieved through good faith negotiations within the agreed-upon timeframe, the established independent dispute resolution mechanisms are initiated. These may include amicable dispute resolution, mediation, conciliation and/or arbitration. It is important that these are agreed upon by the stakeholder forum at the outset. Where a settlement does not emerge, the State will act as the final arbitrator, subject to judicial review.

3. Free, Prior and Informed Consent

Free, prior and informed consent (PIC) of indigenous and tribal peoples is conceived as more than a one-time contractual event – it involves a continuous, iterative process of communication and negotiation spanning the entire planning and project cycles (see Chapter 8, policy principle 1.4). Progress to each stage in the cycle – options assessment including priority setting and selection of preferred options, and preparation, implementation and operation of the selected option – should be guided by the agreement of the potentially affected indigenous and tribal peoples.¹

Indigenous and tribal peoples are not homogeneous entities. PIC should be broadly representative and inclusive. The manner of expressing consent will be guided by customary laws and practices of the indigenous and tribal peoples and by national laws. Effective participation requires an appropriate choice of community representatives and a process of discussion and negotiation within the community that runs parallel to the discussion and negotiation between the community and external actors. At the beginning of the process, the indigenous and tribal peoples will tell the stakeholder forum how they will express their consent to decisions including endorsement of key decisions (Guideline 1).

An independent dispute resolution mechanism to arrive at a mutually acceptable agreement should be established with the participation and agreement of the stakeholder forum, including the indigenous and tribal peoples, at the beginning of any process. It is inappropriate to set rigid

guidelines or frameworks, as these must be negotiated as the process proceeds. The outline presented in *Guideline 2: Negotiated Decision Making Processes* is intended to offer some basic direction to those involved with such processes and independent dispute resolution bodies.

Comprehensive Options Assessment

4. Strategic Impact Assessment for Environmental, Social, Health and Cultural Heritage Issues

Strategic impact assessment (SA) is a relatively recent tool that can be used to provide a new direction to planning processes. It provides an entry point that defines who is involved and maps out the broad issues to be considered. The Commission proposes that the SA process starts by recognising the rights to be accommodated, assessing the nature and magnitude of risks to the environment and affected stakeholder groups, and determining the opportunities offered to these groups by different development options (Guideline 1). It should also identify where conflicts between various rights exist and require mediation.

SA takes the concept of project level impact assessment and moves it up into the initial phases of planning and options assessment. It is a broad assessment covering entire sectors, policies and programmes, and ensures that environmental, social, health and cultural implications of all options are considered at an early stage in planning. It is a generic term that includes a range of planning tools for example, sectoral envi-

ronmental assessments (EA), basin-wide EAs, regional EAs, and cumulative EAs.²

SA should be concerned with the uses and impacts of existing water and energy projects, as well as alternatives for meeting future needs. In practice, SA may have different levels of detail, depending on where it is applied. At one level, the SA would scan and identify priority issues to be addressed subsequently in more detailed planning exercises. For example, the SA would identify whether evaluations of existing projects have been undertaken, or whether outstanding social issues on specific projects had been addressed. At this level, the SA would also assess whether a sufficient range and type of options are being considered in the different planning processes to meet future needs. In cases where the SA is more elaborate and detailed, the exercise may be extended to host a generic options assessment process using stakeholder groups and multi-criteria formulations to screen and rank options (Guideline 6).

The general goals of SA include:

- recognising the rights of stakeholders and assessing the risks;
- incorporating environmental and social criteria in the selection of demand and supply options and projects before major

funds to investigate individual projects are committed;

- screening out inappropriate or unacceptable projects at an early stage;
- reducing up-front planning and preparation costs for private investors and minimising the risk that projects encounter serious opposition due to environmental and social considerations; and
- providing an opportunity to look at the option of improving the performance of

existing dams and other assets from economic, technical, social and environmental perspectives.

SA must be revisited at appropriate intervals with periodic 'state-of-the-sector' reporting. Important variables determining the frequency and intensity of this on-going process include developments in the economy, in technology, in demography and in public opinion. Review of SA reports at the highest political level (for example Parliament) is desirable.

5. Project-Level Impact Assessment for Environmental, Social, Health and Cultural Heritage Issues

Project-level impact assessment (IA) is already standard practice in many countries, and the term is used here to include environmental, social, health and cultural impacts. Deficiencies in past implementation have been identified and improved processes are needed.³

The following changes are proposed to the way project level IAs are implemented:

- Projects should be subject to a two-stage IA: the first is a scoping phase, including full public participation, that identifies key issues of concern and defines the terms of reference for the second, assessment, phase (Guideline 1).
- The timing of the IA should allow the results to feed into the final design of the project. There should be a total integration of technical, environmental and social studies during the design stage. Although executed by different study groups, these studies should run concur-

rently and interactively with regular exchange of information between all study groups.

- IAs should be carried out independently of the interests of the project developer and financing mechanisms should reflect this independence.
- IA should include an Environmental Impact Assessment, a Social Impact Assessment, a Health Impact Assessment (see Box 9.1), and Cultural Heritage Impact Assessment (see Box 9.2) as explicit components and comply with international professional standards. The assessments should be sufficiently detailed to provide a pre-project baseline against which post-project monitoring results can be compared.
- An independent panel of experts (reporting formally to the highest environmental protection authority) should be appointed to assist the government and the developer in reaching sustainable social and environmental outcomes (Guideline 22). The developer must respond to all issues raised by the panel and explain how they will be addressed. The panel's findings and the developer's response are to be made public within a

reasonable period (for example, six weeks).

- Developers should open a local liaison office to ensure adequate access to information for local affected communities in appropriate languages.
- The IA process should culminate in a series of written agreements with those departments or organisations that are required to implement mitigation, development and compensation plans, or respond to the impacts. The scope of these agreements must be fully defined prior to tendering for construction.

Box 9.1: Health impact assessment

A health impact is a change in health risk reasonably attributable to a project, programme or policy. A health risk is the likelihood of a health hazard or opportunity affecting a particular community at a particular time. Health Impact Assessment (HIA) is part of the overall risk assessment process (economic, social and environmental risks) to assess the viability of a project.

The Health Impact Assessment has the following components.

- Assessing the health condition of people in reservoir, infrastructure, downstream, resettlement, irrigation, and other impact areas. The assessment process should engage local people and resources. The parameters derived from the information collected constitute the baseline health situation of the population.
- Predicting changes in health determinants that can be reasonably attributed to the project and that could affect people during each stage of the project. The changes, taken together, produce health outcomes or changes in health states. These are expressed in a minimum of three ranks: no change, increased health risk, and health enhancement. Factors determining health outcomes in past projects involving comparable social, economic and environmental conditions can be used to enhance predictability.
- Assessing the cost of preventing and mitigating the potential health impacts in the overall cost assessment of the project.
- Developing measures to prevent, minimise and mitigate health impacts with the participation of the potentially affected people and incorporating these into contractual implementation arrangements with adequate financial provision.

Source: WHO, 1999, WCD Working Paper

- The IA process continues through and beyond project construction and adequate institutional and financial arrangements for social and environmental audit and monitoring should be included in the planned measures. Contracts with monitoring agencies (for example research institutes or NGOs) should be agreed prior to tendering for construction.
- A redress procedure should be put in place that provides mechanisms for addressing grievances during the resettlement plan and following construction.
- IAs should be public documents, posted on relevant websites, and disseminated in appropriate languages.
- IA should be guided by the precautionary approach.

The precautionary approach requires States and water development proponents to exercise caution when information is uncertain, unreliable, or inadequate and when the negative impacts of actions on the environment, human livelihoods, or health are potentially irreversible. A precautionary approach entails improving the information base, performing risk analysis, establishing precautionary thresholds of unacceptable impacts and risk, and not taking actions with severe or irreversible impacts until adequate information is available or until the risk or irreversibility can be reduced, making outcomes more predictable. Normally the burden of proof will be on the developer.

Decision-makers are faced with the dilemma of how to reconcile competing or conflicting rights and needs. The precautionary approach forms part of a structured approach to the analysis of risk, as well as being relevant to risk management. Determining what is an acceptable level of risk should be undertaken through a collective political

process. The process should avoid unwarranted recourse to the precautionary approach when this can overly delay decision-making. However, decision-makers faced with scientific uncertainty and public concerns have a duty to find answers as long as the risks and irreversibility are considered unacceptable by society.

6. Multi-Criteria Analysis

Multi-criteria analysis (MCA) processes use a mix of qualitative and quantitative criteria to assess and compare options that may be policies, programmes, or projects. Stakeholder-driven MCA processes are flexible and open, based on the concept of a stakeholder forum (see Guideline 1). Their primary purpose is to provide a structured process to screen and rank alternatives and help understand and resolve differences between groups of stakeholders involved in development decisions.⁴

The multi-disciplinary planning team with a time-bounded mandate supports all phases of the MCA process. The results at each stage should be made available to the stakeholder forum and for wider public review. A public hearing should be held on the outcome at each stage if the significance of the process warrants it. If the MCA process cannot resolve all conflicts, the use of MCA may still assist in identifying policy scenarios and the way different groups and interests perceive them. There are many ways of presenting the results of the MCA. One of them is the preference matrix, which demonstrates the equal emphasis given to social, environmental, technical and economic parameters (see Figure 9.3).

Box 9.2: Cultural heritage impact assessment

Cultural heritage resources are the cultural heritage of a people, a nation or humanity as a whole, and can be on the surface, underwater or underground. They comprise:

- Cultural practices and resources of current populations - religions, languages, ideas, social, political and economic organisations, and their material expressions in the forms of sacred elements of natural sites, or artefacts and buildings;
- Landscapes resulting from cultural practices over historical and prehistoric times; and
- Archaeological resources, including artefacts, plant and animal remains associated with human activities, burial sites and architectural elements.

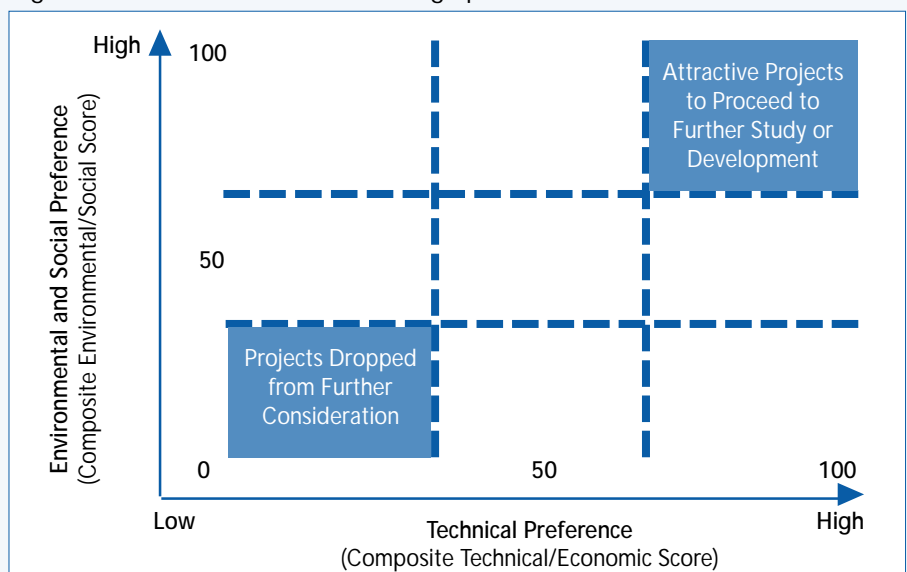
Cultural Heritage Impact Assessment (CHIA) requires adequate time for successful completion and should be looked at in two stages. Firstly, where regions and river valleys are known to be rich in cultural resources, landscapes, or archaeological resources, consideration of these elements should be included in Strategic Impact Assessments (Guideline 4) and used as a criterion in selecting options and avoiding impacts. Secondly, a project level mitigation plan is developed where a dam option proceeds to full feasibility phase.

The following procedural aspects need to be considered:

- financial resources should be specifically allocated to CHIA;
- the assessment team should include archaeologists and, if necessary architects and anthropologists;
- where cultural assets have significant spiritual or religious significance all activities should be planned with the consent of relevant communities;
- assessments should culminate in a mitigation plan to address the cultural heritage issues identified through minimising impacts, or through curation, preservation, relocation, collection or recording; and
- a separate report should be produced as a component of the overall IA process.

Source: Brandt and Fekri, 2000, WCD Working Paper

Figure 9.3 Preference matrix for ranking options



Attributes and steps of MCA processes to select the best mix of options are:

Step 1:

The sponsoring agency prepares terms of reference for the overall process and a stakeholder analysis, and establishes an information centre. Representative stakeholder groups are contacted, and the general public is informed through print and electronic media.

Step 2:

A stakeholder forum is formed and representatives of stakeholder groups identified subject to public review and comment. A multi-disciplinary planning team is formed to support the process and assembles an initial inventory of options.

Step 3:

Public comment is invited on the options inventory including proposals for additional options to be considered. The stakeholder forum confirms the comprehensiveness and adequacy of the options inventory. Where necessary, additional steps are taken to expand the inventory.

Step 4:

The stakeholder forum decides on the criteria for screening the options and criteria for coarse and fine ranking of options are established with input from the planning team.

Step 5:

Options are screened by the planning team according to the agreed criteria, results are presented to representatives of the stakeholder group for approval and subsequently announced for wider public review or comment.

Step 6:

Sequential steps of coarse and fine ranking of options (where the number of options is large) are prepared by the planning team and submitted to the representatives of the stakeholder forum at each stage. The list of options at each stage is made public and an adequate period for comment is provided between each stage. Public hearings may be held at each stage if appropriate.

Step 7:

The final selection of options that would form the basis for detailed planning is presented to agencies, communities, or groups responsible for the detailed planning.

These steps lead to preparation of a limited set of diverse development plans comprising a range of options emerging from the screening process. The multi-criteria exercise may be repeated to evaluate these alternative plans and select a preferred development plan.

7. Life-Cycle Assessment

Life-cycle assessment (LCA) is an options assessment procedure used in the energy sector to compare 'cradle-to-grave' performance, environmental impacts, and market barriers and incentives for different demand and supply options. LCA is located at the front end of the planning cycle. Its results may be fed into multi-criteria screening and ranking processes, which are a basis for

deciding which options to include in subsequent stages of planning. Alternatively, the information generated by LCA is used to develop regulatory policies, for example policies addressing barriers limiting the market penetration of options otherwise considered to be in the interest of society.⁵

LCA assessments can be simple and generic or exhaustively detailed, data-rich, and elaborate. LCA procedures that quantify the

potential impacts of different options on land, air and water resources, including greenhouse gas (GHG) emissions, can be transferred and adapted to different countries. The analytical framework used to assess the direct, indirect, and hidden incentives and market barriers for different options through the full chain of development is also transferable.

LCA would typically include:

- categorisation of the different stages in the life cycle of each option where the impacts and effects are relevant (for example from resource extraction through transport, manufacturing, building, operation and refurbishment to decommissioning);
- identification of the material flows and resource impacts at each stage and comparison of each option using a set of

indicators (for example net efficiencies, the consumption of resources, or the impact per unit of output of the option – such as land use, water use, GHG emissions, and other gaseous, liquid or solid pollution streams); and

- identification of the range and magnitude of the direct, indirect, and hidden subsidies, external factors and incentives across each stage of the life cycle of each option.

The most advanced use of LCA is in the power sector, where it is particularly used to consider the GHG emissions of various options. These factors are becoming the prime driving force behind energy and power sector policies in many countries including Europe, Australia and Canada, and reflect the Kyoto Protocol (Guideline 8).

8. Greenhouse Gas Emissions

Recent research indicates that reservoirs can emit greenhouse gases. Precise assessments are especially important to assist in selecting climate-friendly options and if hydropower projects seek to benefit from any form of carbon credit. The emissions from the natural pre-impoundment state should be included in the comparison with other options. Good field studies with modelling predictions of emissions should be an explicit component of relevant feasibility studies.⁶

Procedures to calculate emissions for conventional and renewable options are well established and available but are continually evolving. An expert workshop convened by the Commission and held in Montreal in

February 2000 decided that net emissions from reservoirs above baseline emissions are the appropriate estimates. To calculate net emissions, the planner must:

- assess the carbon (CO₂, CH₄) and nitrogen cycles (N₂O) in the pre-impoundment watershed context – this involves establishing a carbon budget, including description of flow rates, concentrations, residence time and other relevant measures;
- assess future changes to carbon inputs in the watershed from various activities, including deforestation;
- assess the characteristics of proposed reservoir(s) and inundated area(s) that will change the carbon cycle, including size, temperature, bathymetry, primary productivity and other relevant measures after dam completion; and

- assess the cumulative emissions from multiple dams on a watershed basis in cases where a dam and its operations are linked to other dams.

More baseline measurements are required on reservoirs on existing projects to extend

understanding of the scale of GHG emissions to temperate and semi-arid regions of the world and to catchments with large urban populations. Such data will prove helpful in taking informed decisions on energy options and climate change.

9. Distributional Analysis of Projects

Distributional analysis provides stakeholders and decision-makers with information on who will gain and lose from a project and is an essential tool in promoting more equitable distribution of benefits and costs.⁷ These gains and losses may be expressed in economic or financial terms, or they may be more simply expressed as changes in physical quantities. In some cases only the direction of a specific impact may be discernible.

Integrated distributional analysis requires assessment of the full range of project impacts including financial, social, environmental and economic aspects assessed either in a qualitative fashion, quantified in non-monetary terms, or valued in financial or economic terms. A number of methods focusing on specific aspects of distribution can be used within the overall approach at different stages of the planning cycle.

- Equity (or poverty) assessment comprises an assessment of the impacts (in economic or non-economic terms) and risks of a project on specific sub-populations or groups of concern.
- Macroeconomic or regional analysis includes an analysis of the wider economic impacts using either a simple economic or fiscal impact analysis or a formal regional or macroeconomic model.
- Economic distributional analysis includes an explicit analysis of distribution of the

direct costs and benefits of the project, including those external social and environmental impacts that are to be valued (Guideline 10). This builds on the financial and economic cost-benefit analyses.

Selecting options: Integrated distributional analysis at a preliminary level should be initiated during the early stages of screening and selecting options as part of the strategic impact assessment. It can be carried forward at an increasing level of detail for projects that emerge for further consideration from this process. At the preliminary level of analysis, a matrix is prepared to identify the groups that will either receive benefits or bear the costs of the project and indicate the approximate scale of such costs or benefits. A qualitative equity assessment should also be undertaken and inform the screening process about the comparative impacts of alternatives on vulnerable groups in society.

Feasibility stage: A more detailed and integrated distributional analysis should be undertaken during the feasibility study and include both an economic distribution analysis and equity assessment. The use of a macroeconomic or regional analysis is recommended for projects with a significant irrigation component or inter-basin transfer where there are broader objectives in terms of redistributing income between regions or making a sustained contribution to the macroeconomy. The distributional analysis should be undertaken in full consultation with project stakeholders.

10. Valuation of Social and Environmental Impacts

The methodologies and applications to value environmental and social impacts of dams can be used to ensure that impacts are internalised in the economic analysis where appropriate and possible (see Table 9.1). Where it is undesirable or not possible to express such impacts in economic terms, they should be considered separately as parameters in the multi-criteria analysis (see Guideline 6).

Expertise and experience with these methods in industrialised countries are widespread, and many examples exist of their application to the impacts of dams.⁸ Typically, valuation of the impacts of new dams or the decommissioning of old dams in such countries deals with recreation, tourism, fisheries and, increasingly, people's preference for healthy ecosystems.

A range of methods is available, including those based on observed market behaviour, the stated preferences of individuals, or modelling of choices made by respondents in market surveys. Their purpose is to value previously hidden costs and benefits and make them explicit in decision-making. Whatever the context, the derivation of monetary values for the unmitigated environmental and social impacts of projects is necessary when it assists the transparent, participatory, and explicit examination of project and policy alternatives. Whether these include the valuation of cultural, biodiversity or other intangible values in monetary terms will depend on the local context and on stakeholders' views. As noted, such aspects are often better addressed as an individually weighted component in a multi-criteria analysis.

Many of these valuation methods are equally applicable in the developing world and capacity to apply them increased rapidly in the 1990s. They have been adapted to the rural, developing context, particularly in combining participatory approaches with valuation methods and integrating economic valuation into multi-criteria analysis. Many of the external impacts of large dams affect household livelihoods and thus should be assessed using relatively straightforward market or revealed-preference methods. In particular, a series of relatively straightforward methods such as productivity and substitute-goods methods may be applied to estimate how changes in water quantity, quality, and flow regime affect household productivity and consumption. These methods also apply to the impact of changes in water flows on downstream communities and their natural resources, as well as impacts on major ecosystem functions and services where these provide an economic good. For example, sediment flows and deposition along the coast, which if interrupted, may lead to a need for erosion control measures.

Studies of this nature should involve at least three steps:

- a scoping exercise to identify and select impacts to be valued;
- valuation studies; and

Table 9.1: Valuation methods

| | Observed Behaviour | Hypothetical Behaviour |
|-----------------|--|--|
| Direct | Market Prices | Stated Preferences |
| | Competitive market prices Shadow pricing | Contingent valuation (dichotomous) choice, willingness-to-pay, bidding games |
| Indirect | Revealed Preferences | Choice Modelling |
| | Productivity methods Avertive (defensive) expenditure Travel cost Hedonic pricing Substitute goods | Contingent referendum Contingent ranking Contingent behaviour Contingent rating Pairwise comparisons |

Source: Freeman, 1993; Pearce, pers. comm. 2000; Barbier, pers. comm. 2000.

- public meetings to report back to the stakeholder forum on the results of the studies.

The scoping exercise may be incorporated into the initial stage of project impact assessment

(see Guideline 5). Finally, the information generated through valuation studies should have an explicit role in informing not only applicable cost-benefit and distributional analyses, but also the negotiations between stakeholders and decision-makers.

11. Improving Economic Risk Assessment

All infrastructure projects and commercial undertakings involve risk, uncertainty and irreversibility. Project risk assessments generally take into account technical, economic and financial aspects.⁹ The Commission recognises the nature of social and environmental risks and that these can be addressed through other mechanisms (Guidelines 4, 5, 18).

The following are recommended as a general approach for technical, financial and economic risk assessment:

- the assessment of risks should be included in all steps of the planning cycle;
- identification and selection of risks for assessment should be undertaken as part of the larger stakeholder and multi-criteria processes;
- past performance of large dams should be used to identify likely ranges for the variables and values to be included in risk and sensitivity analysis; and
- sensitivity analysis should be complemented by a full probabilistic risk analysis.

Good practice involves the use of probabilistic risk analysis, a quantitative technique that employs the probability distributions of individual variables to produce a consolidated single probability distribution for the criteria of interest.

For example, in determining economic risk, the probabilities of different values for inflows and power generation can be combined with probabilities of cost overruns in a cost-benefit analysis to result in a probability distribution of net returns. This provides a robust assessment of the risk of different outcomes (see Box 9.3). It introduces a more effective approach than the simple sensitivity analysis used to assess the effect of potential changes in important variables where the cost-benefit analysis may have been re-run for a number of individual scenarios. For example, the sensitivity analysis is used to see whether the project is still profitable when the planned project costs increase by 20%.

In implementing these general recommendations on economic risk analysis across the planning cycle, a number of specific suggestions should be considered.

At all stages:

- improved prediction of project costs by using a frequency distribution of the cost overruns for similar projects.

At options assessment stage:

- a simple sensitivity analysis using agreed value ranges for key variables; and
- a qualitative comparison of options under consideration in terms of the uncertainty associated with the cost and benefit streams of each project.

At the feasibility stage

- a full probabilistic risk analysis of economic profitability;
- modelling of changes and variability in hydrological estimates that may result from climate change and their effect on delivery of services and benefit flows; and
- investigation of the likely benefits of risk reduction measures and the costs this entails.

Box 9.3: Ghazi-Barotha, Pakistan

The World Bank appraisal of the Ghazi-Barotha hydroelectric project in Pakistan used a probabilistic risk assessment of the economic rate of return (EIRR) of the power expansion programme, with the risks summarised under four scenarios: demand uncertainties, cost profiles, schedule delay, and amount of additional capacity provided by private projects. Each scenario has three alternative states. Probabilities were assigned to each scenario so that a weighted average EIRR could be obtained. This yielded 54 total possible outcomes. For each one the expected value of the EIRR, calculated as probability times its own EIRR, is then summed over all outcomes to give the expected EIRR. A probability distribution of EIRR was then calculated for the overall power sector programme and for the project alone.

The results indicate that the risk-weighted EIRR on the overall investment programme is 18.5%. This is lower than the Base Case estimate, but considerably higher than the opportunity cost of capital at 12%. The probability of the EIRR falling below the opportunity cost of capital is estimated at 8%. The risk-weighted EIRR proved quite robust to changes in the basic probabilities.

Source: World Bank, 1995.

Addressing Existing Dams

12. Ensuring Operating Rules Reflect Social and Environmental Concerns

Agreements on operating conditions should reflect commitments to social and environmental objectives in addition to the commercial interests. At all times the safety and well being of the people affected must be guaranteed throughout the project cycle. All operating agreements should be available to stakeholder groups.

River diversion during construction

Emergency warning and evacuation plans are needed in the event of overtopping of temporary diversion works. Licence conditions should assign responsibility for compensation to the downstream population for any damages that occur during such events.

The compensation would be limited to those impacts caused by the breach, over and above the natural flood event.

Releases to the downstream river to satisfy drinking water and environmental requirements should be maintained during river diversion. If, for technical reasons, flow is interrupted, the operator must guarantee that alternative supplies of drinking water will be made available to the downstream population.

Reservoir filling

During the reservoir filling period, there should be releases of good quality water to the downstream river to satisfy drinking water, irrigation, and environmental requirements. If the water quality is expected to be poor, then – as with the agreement on river diversion – alternative supplies of

drinking water must be made available for the downstream population.

Test operation

Test operation of the spillway (if gated), of other outlet works, and of the turbines can lead to major sudden releases to the downstream river, endangering human and animal life. The operator will be responsible for warning the downstream population that sudden releases may occur and may be dangerous. Local fishers will be compensated for days when fishing is impossible. If test operation takes place during the dry season, people experiencing damage to recession agriculture must be compensated.

Operation

A range of agreements on the operating phase should be covered in the licence:

- environmental flow releases to the downstream river;
- minimum technical releases to the downstream river (for navigation, water supply, downstream irrigation and so on);
- maximum ramp rates for downstream releases (to avoid problems with navigation and damage to the river banks);
- water allocations during normal operation;
- operation during normal and exceptional floods;
- warning of people potentially affected and rules for evacuation of people and animals;
- opening of spillway gates;
- periodic safety inspection by independent parties;
- drawdown procedure if dam safety is in doubt;
- monitoring of relevant operation data and dissemination of data to stakeholders; and
- periodic review of operating rules.

13. Improving Reservoir Operations

A range of project specific non-structural and structural methods to adapt, modify, improve, or expand operations of dams and associated facilities may be considered at different periods in time. Structural measures may include modernising equipment and control systems and improving civil structures such as spillways, intakes and canals. Non-structural measures generally involve a change in reservoir operation practices to optimise benefits, cater to changing water use priorities, enhance conjunctive operation, or improve sediment management. Dam safety improvement and updating contingency plans for operation of reservoirs in extreme flood events are other aspects of adaptive management.¹⁰

Detailed technical guidelines are available on ways to change reservoir operations either by adapting existing rule curves or introducing more modern computerised decision support systems, including real-time data inputs, simulations and forecasting. In adapting reservoir operations owners/operators should:

- work with stakeholders to collect views on current reservoir operations and views on the need, concerns, and limitations of potential future changes in water release patterns, including downstream impacts;
- confirm any change in the priority of water uses (such as environmental flows) and evaluate the scope to use flow forecasting to optimise reservoir operation (Guideline 15);
- use simulation models where feasible, to assess the scope for optimising the supply of water and energy (for example timing,

quantity) into the system (for example irrigation canal system and conjunctive use of groundwater, power grid or water distribution system) to improve the overall value of the services in the system;

- assess the ability to operate the reservoir to optimise delivery of services using computerised models;
- assess the scope to further optimise interactive operation of the reservoir with other reservoirs, diversions or facilities using basin-level decision support systems;
- provide clear responsibilities and procedures for emergency warning and improved preparedness of downstream countries, operator training and downstream evacuation in extreme flood events; and
- ensure monitoring systems are in place and feed into operational decision making.

Sediment management is one area where increased attention is needed. A sediment management plan would consist of:

- monitoring sediment in the reservoir, including quantitative and qualitative analysis of sediment to verify properties and pollution levels;
- minimising sediment deposition in reservoirs where possible by sluicing or density current venting;
- removing accumulated deposits where possible by drawdown flushing (drawing the water level down during high-flow seasons), and excavation of sediments; and
- catchment management programmes to reduce sediment inflow to the reservoir where possible as part of a basin-wide plan.

Sustaining Rivers and Livelihoods



14. Baseline Ecosystem Surveys

The effectiveness of mitigation, enhancement, compensation and monitoring measures require better baseline knowledge and understanding of ecosystems. Baseline assessments inform both the national policy on maintaining rivers and requirements for environmental flows and other compensation and mitigation measures. They are not restricted simply to an ‘impact statement’, but instead gather the necessary baseline information prior to alternatives being assessed.¹¹

The baseline surveys aim to establish the link between the hydrological regime of the

river and its associated ecosystems. Baseline surveys should gather relevant information on:

- the life cycle of important fish species (especially migratory species);
- the distribution of habitat for threatened or endangered species;
- important areas for biodiversity; and
- key natural resources for riverine communities.

The studies should explicitly identify where modifications to flow or water quality will have significant impacts on biodiversity, habitats, or riverine communities and provide the scientific basis for testing flow and quality scenarios against ecosystem

responses (Guideline 15). Such studies would normally be undertaken over several seasonal cycles.

Appropriate research agencies staffed with specialised scientists should undertake

baseline surveys, assisted where necessary by international networks. Enhanced local and regional capacity will help identify, understand and manage environmental impacts, hence improving environmental outcomes for current and future dams.

15. Environmental Flow Assessments

Dams should provide for an environmental flow release to meet specific downstream ecosystem and livelihood objectives identified through scientific and participatory processes. In some cases managed floods may be necessary to maintain downstream floodplains and deltas. Several approaches are available for assessing environmental flow requirements (EFR), ranging from 'instream flows', which refer to within-bank flows, to 'managed flood releases' designed to overtop and supply floodplains and deltas. 'Environmental flow' includes all of these and stresses the need to meet clear downstream social and ecosystem objectives rather than simply releasing a quantity of water.¹²

Environmental flow assessments (EFA) can be done at several levels of detail, from a simple statement of water depth to provide wetted habitat for a particular fish species to a comprehensive description of a flow regime with intra-annual and inter-annual variability of low flows and floods in order to maintain complex river ecosystems. Confidence in the suitability of an EFA to meet its objective is linked to the level of investment in appropriate specialist inputs.

Holistic methodologies contribute to a detailed understanding of the merits and drawbacks of a series of competing water resource options in terms of required river

flow, water available for off-channel use, and the social and economic implications. Sophisticated habitat-modelling techniques provide additional detailed information on the flows required for specific valued river species or features, where the targeted rivers are of high conservation importance or have a high likelihood of conflicts over water.

EFRs are an integral part of the impact assessment process (see Box 9.4.). Continual interaction with the design team is essential to ensure that the least damaging and most flexible options are retained and that the dam design reflects the structural and operational needs of the flow release.

The Knowledge Base provides guidance on the following steps to informed decision-making leading from baseline surveys to environmental flows¹³:

Step 1: Situation assessment

Identify the extent of the targeted river system likely to be affected by a dam – upstream, downstream, and in the reservoir basin – and alert decision-makers to the likely ecological and social issues that will need to be addressed. This draws on data in the baseline surveys, where these exist.

Step 2: Specialist surveys and identification of ecosystem components

A range of specialists (ecologist, geomorphologist, sociologist, and resource economist) undertakes field surveys to provide a comprehensive description of the affected

river. The studies link flow-related information with ecological and social values.

Step 3: Developing predictive capacity on biophysical responses to dam-related flow changes

The team develops data sets, models and various analytical tools that can be used in scenario creation to assist decision-making (Step 5). These may include, for instance, specifying conditions needed for a certain fish species to spawn, or how water quality differs between the rising and falling arms of a flood hydrograph, or how downstream fisheries and pastures will be affected.

Step 4: Predicting social impacts of the biophysical responses

The present river use, exploitation of river-related natural resources, and health profiles of the affected people and their livestock are quantified, and possible flow-related health risks are identified.

Step 5: Creating scenarios

Scenarios are created that include social, biophysical, and economic parameters and present a series of future options for decision-makers. Scenarios may be defined by:

- the volume of water required as yield from the dam – the rest is allocated to the river;
- protection of a valued species, community, or river feature, in which case a flow regime to achieve this would be described;

- a definition of the priorities of the competing users, and a description of the resulting flow regime and its effect on river condition; and
- river rehabilitation downstream of an existing dam, in which case the best that can be achieved within the design limitations of the dam is described.

In addition, the ‘no development’ scenario should always be included.

Step 6: Selection and implementation of one scenario

This requires:

- reflection of the chosen scenario in the dam design and the Environmental Management Plan; and
- monitoring of implementation to ensure that objectives are met

Box 9.4: Design and cost of environmental flows - Pollan Dam, Ireland

The EIA results for the Pollan Dam showed that migratory salmon were present upstream of the dam site, and that the dam would act as a barrier to salmon movements, affecting the fishery. The environmental water releases were designed to meet the seasonal needs of the migratory fish. Design modifications had major implications for structures such as the concrete dam, spillway, and downstream channel. The capital cost of all environmental protection measures is estimated to have increased the total cost of the project by 30% (from \$6 million to \$8 million). The flows have been effective in maintaining the salmon population and the recreational fishery.

Source: Smith, 1996; Bridle, pers. comm. 2000

16. Maintaining Productive Fisheries

The impact of dams on fish and fisheries is of major concern in many parts of the world. Several issues need attention in order to maintain productive fisheries (see also Guideline 15).¹⁴

Fish passes should be tested and shown to be efficient mitigation tools. Fish pass design has focused on the needs of leaping salmonids that usually dominate fish communities in fast-flowing rivers in the industrialised northern countries. Yet many fish species in slow-flowing tropical rivers are unable to use this kind of fish pass as they do not leap.

Box 9.5: Benefits of improving fish passes

In 1976 a pool-and-weir type fish pass was incorporated into a tidal barrage on the Burnett River in SE Queensland, Australia. Assessment of the fish pass in 1984 and 1994 showed it to be ineffective, with only 2 000 fish of 18 species ascending over a 32 month period. The fish pass was modified to a vertical-slot design with low water velocity and turbulence. Over 17 months 52 000 fish of 34 species used the redesigned fish pass. Non-leaping fish are now able to use the fish pass, benefiting the entire fishing community on the river.

Source: Flanders, 1999; env219, WCD Submission

Where fish passes exist, their effectiveness should be measured and their design improved where efficiency is low. For new dams, proposed fish pass designs should be tested hydraulically and their appropriateness for the target species explicitly assessed. (See Box 9.5.)

Where the reservoir fishery will be assessed as a project benefit, the proposal should explicitly include regional experience of similar reservoir fisheries, rigorous assessments of potential reservoir productivity, and proposals for the institutional mechanisms to manage the new fishery. Relevant contracts should be established between the

project proponent, the agencies responsible for developing or managing the reservoir fishery, and the fishers, with priority given to affected people. Fisheries management objectives for dams include:

- preventing the loss of endangered and/or commercially important fish biodiversity;
- maintaining fish stock abundance;
- ensuring the long-term sustainability of the catch, employment and income; and
- producing fish for local consumption and exportable fish products.

Reservoir fisheries management concerns focus on protecting spawning grounds in affluent inflow areas, stocking to increase production (for example, of a small pelagic fishery) and advice on management of the water level to reduce impacts that harm fish stocks. Downstream river fisheries management focuses on aeration of anoxic discharge water from the dam, provision of effective fish passes, reduction of turbulence in the stilling pool, and mitigation of fish losses on the downstream floodplain through flow releases.

Recognising Entitlements and Sharing Benefits

17. Baseline Social Conditions

Constructing a social baseline is central to the planning and implementation process. It provides key milestones against which project performance and positive and negative impacts on people can be assessed through periodic monitoring and evaluation. It is also a key input to strategic social impact assessment (Guideline 4).¹⁵

Social baseline assessments should be done at two stages in the planning process:

- a low-intensity appraisal during options assessment, linked to Strategic Impact Assessment; and
- a more comprehensive baseline during Project-level Impact Assessment once an intervention emerges from the options assessment process.

In light of the significance of the impacts that can occur between the time a decision is made to develop a project and its actual implementation, the second baseline study may need to be updated at the tender stage

of a project. Subsequent monitoring activities can follow standard practice.

Baseline studies should be undertaken for all impact areas, and in particular the areas and communities likely to be positively and negatively affected by the project. Groups to be considered include communities to be displaced, prospective host communities, downstream and upstream communities, and command area inhabitants (irrigation schemes, transmission line corridors, and other infrastructure areas). The social baseline study should be participatory and involve discussion and feedback through stakeholders (Guideline 1). It should also be accessible to the general public.

Some of the common techniques used to assess baseline social conditions combine gender-sensitive household surveys, community-level participatory appraisals, and other

methods such as key informants, oral testimonies and preference assessment, direct observations and literature review. For the assessment of social processes, some of the participatory appraisal methods (such as the Venn diagram of institutional processes) can be useful. Aerial photos, satellite imagery, and geographic information systems can be combined with participatory community resource mapping exercises.

The State is responsible for ensuring that social baseline information is collected. The task should be carried out by independent institutions selected in consultation with the stakeholder forum. Large projects should be considered as an opportunity for building local capacity (in relevant government agencies, academic and research institutions, and civil society organisations) to undertake social assessment and monitoring.

18. Impoverishment Risk Analysis

The impoverishment risks and reconstruction analysis model for resettling affected and displaced populations adds substantially to the tools used for explaining, diagnosing, predicting, and planning for development. This guideline should be read in conjunction with Guideline 4: *Strategic Impact Assessment*, Guideline 5: *Project-related Impact Assessment* and Guideline 17: *Baseline Social Conditions*. At the core of the model are three fundamental concepts: risks, impoverishment and reconstruction. Impoverishment risks are analysed by separating out the components of the displacement process. They are landlessness; joblessness; homelessness; social, economic, and political marginalisation; food insecurity; increased morbidity and mortality; loss of

access to common property resources; and loss of socio-cultural resilience through a community's inability to secure its interests.¹⁶

The internal logic of the model suggests that:

- preventing or overcoming the pattern of impoverishment requires risk reversal;
- explicit identification of risks in advance is crucial for planning counter-risk measures; and
- the transparent recognition of risks in advance will allow planners and affected people to search for alternatives to avoid displacement or to respond with mitigation and development measures or strategies and coping approaches.

The strategy to implement the impoverishment risk model includes the following:

- the baseline study covering such aspects as numbers of affected people, availability and access to resources, sources of livelihood and social, cultural, demographic, economic and political conditions and processes (Guideline 17) – these studies must incorporate variables to construct key elements of the risk model, in addition to collecting data on other aspects;
- the baseline study providing information to understand how social, economic and cultural networks, physical environment and resources support the well-being of individuals, households and communities; and
- mitigation, development and benefit-sharing measures to improve the livelihoods and well-being of affected people, and to provide the social and physical environment that would enable individuals, households and communities to

successfully overcome impoverishment risks.

A four stage, two-generation model that would enable affected communities to reach full development includes¹⁷:

- developing benefit sharing, mitigation, and development plans with the participation of the affected people;
- enabling resettled people to cope and adapt following displacement, with continued support from the government and civil society groups;
- supporting economic development and community building within resettlement areas; and
- hand over of resettlement sites and incorporation within broader social and political institutions at a stage when resettlement and development plans are fully realised and capable of sustaining the gains for future generations.

19. Implementation of the Mitigation, Resettlement and Development Action Plan

A mitigation, resettlement, and development action plan (MRDAP) is negotiated between all affected peoples, the government and the developer. It generally has two elements – a master contract and a performance contract.¹⁸ The affected people were identified through an Impoverishment Risk Analysis (Guideline 18). One component of the MRDAP may be a Project Benefit-Sharing Mechanism (Guideline 20). The overall obligations and responsibilities of the government and the developer will be included in the Compliance Plan (Guideline 21).

A master contract ensures that the MRDAP provisions and responsibilities are clearly understood and assigned, while a performance contract formalises provisions and commitments with affected families and communities. These two legally binding contracts are found at the government and developer level and the affected persons and community level. Where government ministries or departments act as the developer, there may not be a need for a master contract, but their obligations in this regard should be clearly stated in the MRDAP. In such cases, they will enter into agreements directly with affected people through performance contracts.

At the government and developer level

The MRDAP should have legal status. Countries with resettlement and rehabilita-

tion acts or policies should make suitable amendments to ensure that contracts apply to all affected communities including downstream communities.

- The master contract is concluded between the developer (public corporations, private, or joint) and the government. In the contract, the developer agrees to carry out all the actions set out in the MRDAP in a timely manner. It specifies government responsibilities for providing support to acquire land, staff, schools and so on.
- A private sector developer should sign a performance bond supported by financial security (Guideline 23).
- Where the government undertakes to provide other services (including land acquisition, road building and health care), the responsible line ministry enters into agreements with other appropriate ministries to provide them.

The master contract:

- specifies penalties, incentives, remedies, and other measures to facilitate compliance by the government and the developer;
- provides for the establishment of a mitigation and development office for implementation purposes. This is usually staffed by government officials drawn from various ministries supported by staff from the developer;
- confirms the role of a multi-stakeholder committee as a subgroup designated by the stakeholder forum (including senior government officials, the developer, NGOs and affected peoples groups) to deal with grievances and supervise the work of the mitigation and development office;
- empowers the mitigation and development office to monitor the implementation of the MRDAP;

- provides for continuous monitoring of implementation by an independent field monitoring team, selected with the consent of the affected people and reporting to the multi-stakeholder committee;
- confirms the composition and role of a panel of experts for the implementation phase (Guideline 22), appointed by and reporting to the multi-stakeholder committee to assess whether the MRDAP is being implemented correctly, rehabilitation objectives are being achieved and project benefits are being provided to affected people; and
- establishes a mechanism for dispute resolution – the multi-stakeholder committee is responsible for hearing disputes and grievances related to execution of the performance contract where the mitigation and development office has been unable to resolve issues. If the committee cannot resolve the dispute or grievance, the matter will be referred to the appropriate judicial body.

At the community and affected persons level

Based on the provisions of the master contract, performance contracts are agreed with the community and affected persons detailing:

- compensation, resettlement, and development entitlements;
- schedule and method of delivery;
- institutional arrangements to deliver the commitments;
- obligations and responsibilities of the parties in the contract, namely affected peoples, community, government and developer; and
- recourse procedures.

The master and performance contracts have to be agreed at the project feasibility stage

and signed prior to tendering the construction contract. The signing of the performance contracts by the affected persons and communities signals their consent for

project implementation. The multi-stakeholder committee addresses all disputes related to performance contracts.

20. Project Benefit-Sharing Mechanisms

Adversely affected people are entitled to share in project benefits. Beneficiaries and benefits need to be identified and will form part of the Mitigation, Resettlement and Development Action Plan (see Guideline 19). The nature of agreed benefits can take many different forms.

Type of project benefits

Project Revenues-Related: A percentage share of project revenues/royalties, the construction budget and other profits. A joint enterprise with affected people having a share of equity.

Project Benefit-Related: Provision of irrigated land or an opportunity to purchase irrigated land, access to irrigation water, provision of electricity supply, domestic water supply from the project as appropriate. Right to reservoir fisheries, cultivation in the draw-down area of the reservoir, and contract to manage recreational/water transport facilities.

Project Construction and Operation-Related: Employment in construction, plant operation, and service sector of the project. Financial and training support for self-employment contract to provide goods and services.

Resource-Related: Preferential access to, or custodianship of, catchment resources for defined exploitation and management purposes, catchment development such as planting fruit trees or reforestation, access to

pumped irrigation from the reservoir, and benefits from managed flows and floods.

Community Services-Related: Provision of better and higher levels of service including health, education, roads and public transport, and drainage; income support for vulnerable or needy households; agricultural support services including preferential planting materials and other inputs; community forests and grazing areas; market and meeting spaces.

Household-Related: Skills training and interim family support; interest-free loans for economic activities, housing improvements, provision of start-up livestock, access to public works or work for wages, free or subsidised labour-saving devices or productive machinery, access to preferential electricity rates, tax rates, water and service charges.

Identification, assessment, and delivery of benefits

Definition of Beneficiaries: Beneficiaries include all people in the reservoir, upstream, downstream, and in catchment areas whose properties, livelihoods, and non-material resources are affected; and also those affected by dam-related infrastructure such as canals, transmission lines, resettlement, and other factors.

Identification of Beneficiaries: Baseline surveys must establish the nature and extent of loss to livelihoods and enumerate all categories of adversely affected and displaced individuals, families, and communities. This will be done with the participation of the affected people

and reflect a rights-and-risks approach (Guideline 17).

Eligibility and Level of Benefits: All adversely affected people are entitled to benefits. The level of benefits must be assessed, agreed upon by the parties involved (affected people, government, and developer/financier) and included in the performance contract.

Benefit Delivery and Redress Mechanisms: The mitigation and development office is responsible for the delivery of benefits to the affected people (Guideline 19). The multi-stakeholder committee will hear all representations relating to identification of beneficiaries, apportionment of benefits, performance contracts, and delivery of benefits.

Ensuring Compliance

21. Compliance Plans

The preparation of an overarching Compliance Plan by the developer will address technical, financial, social and environmental obligations and commitments and provide the means for the developer to describe clearly how compliance will be ensured for a particular project. The stakeholder forum will be able to monitor compliance against the plan, which will be a publicly available document.¹⁹

States are at different stages in the development of regulatory systems and institutional capacity. The range of tools selected to ensure compliance for any particular project would vary from case to case. While variations in systems and capacity will result in project-specific Compliance Plans, the level of compliance should be consistent.

In using Compliance Plans in connection with the construction of dams, a number of issues will need to be addressed on a case-by-case basis, including the following:

- *The laws applicable to the construction of dams.* These will vary from country to country, and the Compliance Plan will need to be consistent with local laws.
- *The use of voluntary measures.* These will include tools such as comprehensive compliance criteria and guidelines, ISO certification, integrity pacts (see Guideline 25) and the independent review of internal processes and commitments.
- *The level of in-country institutional capacity.* Where it is insufficient to meet the requirements of the plan, provision must be made for training and other technical assistance, as required, to ensure sufficient capacity is put in place.
- *The use of performance bonds, supported by financial guarantees and trust funds.* The use of one or both of these measures will be needed to ensure sufficient funds have been set aside to secure performance. They will need to be developed and applied in a manner that best suits the particular circumstances (see Guideline 23: *Performance Bonds* and Guideline 24: *Trust Funds*).
- *The cost of compliance.* The cost of compliance will need to be built into the plan, the project budget and the evaluation process.
- *Performance indicators and benchmarks* need to be established against which compliance can be assessed.

22. Independent Review Panels for Social and Environmental Matters

Independent review panels (IRP) should be established for all dam projects. They differ from tribunals, commissions, judicial reviews or other recourse mechanisms as their principal task is reviewing assessment of impacts and the planning, design and implementation of social and environmental mitigation plans. In some countries their recommendations can be binding on all parties. In others they are only advisory. The scope of the IRP powers is laid out in its terms of reference. They report to the regulator, developer, consultants, affected peoples and financing agency to help ensure the best possible social and environmental outcomes. The IRP is not a dispute resolution mechanism, but may assist in bringing issues to the attention of the relevant body for resolution.

IRPs offer independent assessments of the issues that should be dealt with in project level impact assessments and project implementation, while also providing a mechanism to transfer best practice from one project to another, both nationally and internationally. IRPs further provide a quality control function to assure the developer, regulator, financing agency and affected groups that the necessary standards are being met and that laws or guidelines are complied with, as laid out in the Compliance Plan. They usually perform functions in the social and environmental domain similar to independent engineering inspectors for technical issues.

The composition and tasks of IRPs can be adapted to different stages of the project cycle, although it will be useful to maintain core members (normally one ecologist and

one social scientist) to ensure continuity through the different project phases. Planning and appraisal may call for different skills and composition to those needed for monitoring implementation of an environmental management plan or the resettlement and development programme.

In establishing an independent panel, States and financing agencies should consider the following:

- Project level IRPs should be established by the State (as developer or regulator or the Ministry of Environment), in agreement with the stakeholder forum, as soon as the options assessment has decided on a dam as a possible option, and prior to project-level impact assessment beginning.
- IRPs are funded by the State, the developer or a financing agency according to local circumstances. The IRP forms an integral part of project costs.
- The primary reporting responsibility of IRPs should be to the national government involved and more specifically the responsible project agency and regulator. The IRP should include members able to effectively address the major issues that are addressed by state-of-the-art ecosystem, demographic, social and health assessments. They have the prerogative to add additional members to deal with issues for which the IRP has insufficient expertise.

Panels should include at least one host country national and at least one member supported by any affected people. The IRP is independent of all parties and its terms of reference should allow the panel to look into any issues deemed important without the need to justify such examination.

- The developer ensures systematic information distribution to the IRP, which

has access to all project-related documentation.

- All reports following panel missions must become public documents once the developer or appropriate agency has had a reasonable time to comment (usually one month). Should the developer or other agencies request assistance on a confidential basis then that is an issue for them and the IRP to negotiate.

- The developer has the obligation to show how they are responding, or intend to respond, to the issues raised by the IRP.
- Frequency of IRP visits to the project area should be flexible. In some phases one per year may be sufficient, though once construction starts, six monthly intervals would be more appropriate.

23. Performance Bonds

Performance bonds supported by financial guarantees provide a secure way of ensuring compliance with commitments and obligations (see Box 9.6). They are used by mining and environment protection agencies and in the construction industry in many different countries. The bond is called upon, either in whole or in part, to meet unfulfilled obligations and commitments or is released when commitments are met, either in whole or in part, depending upon the circumstances.

Performance bonds have been used widely in the construction industry to ensure that work is completed within the specified time period and to specified standards (including during the construction of dams). They are also used in relation to activities that carry a high risk to the environment; for example ensuring that mine sites will be rehabilitated.

In applying the use of performance bonds to the social and environmental mitigation measures related to the construction of dams, a number of issues will need to be addressed on a case-by-case basis, including the following:

- *The activities the bond will apply to.* The bond could apply to a wide range of activities, such as physical resettlement and provision of benefits, environmental

mitigation works, monitoring, auditing and decommissioning, or to aspects of each of these activities. Bonds should be carefully targeted to activities identified in an approved management plan and, preferably, should apply to the developer who is ultimately responsible for the entire project. The developer may in turn enter into performance bonds with contractors.

- *The form of security, including insurance cover, to be provided.* A package of measures can be used that collectively results in providing sufficient financial assurance. The use of bank guarantees is a cost-efficient method of providing financial assurance, but there are many others, including insurance cover.
- *Who will hold the bond and hence determine whether to release or use the security.* The relevant government agency (the environmental protection agency or mines department) has been used in most countries where performance bonds have been used to date. However, a well-structured trust fund can also be used, particularly where the government is also the developer (Guideline 24).
- *The appropriate level of financial assurance.* Considerations include the higher cost to government to do the works, a contingency sum for high-risk activities,

Box 9.6 Financial assurances and the Environment Protection Agency, Victoria, Australia

The use of performance bonds supported by financial assurances has now been successfully applied in a number of different areas. For example, following a chemical waste management company becoming bankrupt and leaving the government with a potential liability to dispose of abandoned waste, the Victorian Environment Protection Agency (EPA) required financial assurances from 38 companies involved in the waste industry. The level of the financial assurance was arrived at based upon the extent of the environmental risk – which has since been reduced where improved environmental management systems have been put into place. While the EPA has not called on any financial assurances to date, the programme has been successful in raising the performance of the industry overall and has protected the government from financial risk. The programme is being extended to cover landfills and major petroleum product storage sites.

Source: Robinson, pers. comm. 2000

making provision for staged assurance, and providing a discount for quality management, good past practice, and/or a lower risk activity.

- *The stages of the development when the security will be released.* Partial release provides a form of financial incentive to the developer to discharge its responsibilities.
- *Regular review of the level of security to reflect the actual costs.* A fall-back provision is needed that allows the State to extract the difference from the developer where the level of security proves to be insufficient.

24. Trust Funds

Trust funds have been used over a long period of time, and in a wide variety of situations, to ensure that funds set aside for a particular purpose are used for that purpose (see Box 9.7). In recent years they have been applied to the establishment and ongoing management of government-protected areas, through initiatives funded by the Global Environment Facility amongst others. There is scope to extend these funds to other areas where there is a need to set aside monies to be applied for a particular purpose, such as benefit sharing and mitigation measures associated with the construction of dams. They could also be used for decentralising responsibility to affected communities for planning and implementing their own mitigation, development and resettlement programmes.

Trust funds could be effectively used, either alone or in conjunction with bonds, to secure the financing of ongoing obligations in relation to monitoring and auditing – activities that must continue for the life of

the project. This could include providing an effective means for the collection and distribution of royalties from dam-related activities to fund ongoing initiatives.

The use of trust funds would be most appropriate where the proponent is the State. In such cases, the concern is no longer one of ensuring that the risk is not passed from the developer to the government, rather it is ensuring that the risk is not passed from the State to the affected communities and to the environment.

In using trust funds in connection with the construction of dams, a number of issues will need to be addressed on a case-by-case basis, including the following:

- *The laws applicable to the establishment of trust funds.* These will vary from country to country, and the trust deed will need to be consistent with local laws.
- *The content of the trust deed.* This will need to include an open and transparent process for appointing trustees and administering the fund and for setting

out the activities the funds will be applied to, such as resettlement, environmental mitigation, monitoring and auditing. The deed must be publicly available.

- *The trustees of the fund.* The trustees will need to be sufficiently independent from the developer and have the confidence of stakeholders.
- *The role of affected people.* Their role in managing trust funds in relation to mitigation, resettlement and development needs to be defined.

Box 9.7 Suriname Central Nature Reserve

In 1998, the Government of Suriname announced the creation of the Central Suriname Nature Reserve, a protected area that covers 10% of the country. The ongoing maintenance of this protected area is secured through the Suriname Conservation Foundation Trust Fund announced in April 2000, which will ultimately administer a \$15-million endowment. This sum will be invested in the fund through contributions from numerous donors. The fund will be used for long-term management support, ecological surveys, conservation awareness and education, and ecotourism as a conservation enterprise. The fund's trustees are drawn from government, sponsoring institutions, the private sector, and indigenous peoples.

Source: Famaloro, pers. comm. 2000

25. Integrity Pacts

Integrity pacts relate to the procurement process, namely the supply of goods and services. (See Box 9.8 and Chapter 8 Strategic Priority 6: Ensuring Compliance) They are voluntary undertakings aimed at reducing corruption and founded on contractual rights and obligations. They can be used as one component of a Compliance Plan. Integrity pacts are of particular use in situations where regulatory systems and institutional capacity are weak, but they have universal application.²⁰

Integrity pacts in various forms have now been tried and tested in many countries.

In applying the use of integrity pacts to the construction of dams, a number of issues will need to be addressed on a case-by-case basis, including the following:

- *The form and content of the pact.* The form and content of the pact must comply with accepted international models and past applications.
- *The level of in-country institutional capacity.* Where this is insufficient to meet the requirements of the integrity pact, provision must be made for training and other technical assistance, as required, to ensure sufficient capacity is put into place. This should be covered in the Compliance Plan (Guideline 21).

Box 9.8 Mendoza Province, Argentina

The Provincial Governor of Mendoza Province, Argentina decided in 1997 to amend procurement rules to include an Integrity Agreement between the Government of the Province and companies interested in bidding for government contracts. Government commitments under this agreement include providing full transparency in relationships with suppliers, ensuring that employees will not accept or demand any bribes, informing the State Prosecutor of any violations, requiring a bid bond, excluding violators from future contracts, and having the State Prosecutor oversee implementation of the policy.

Source: Wiehen, 1999

26. Procedures for Shared Rivers

A basin-wide perspective is promoted for open discussion of the issues, negotiation on sharing the benefits, and the mitigation of any adverse impacts. The procedures for equitable and reasonable utilisation, no significant harm, prior notification, impact assessment, and dispute resolution will build on provisions of the UN Convention on the Law of the Non-Navigational Uses of International Watercourses and other international agreements. Such provisions are also relevant to rivers within a country shared between a number of sub-national entities.

Prior notification

States considering options that may have a significant impact on other riparian States should notify those States at various stages and establish an effective channel of communication between all potentially affected parties. Notification should occur:

- at an early stage of planning, as part of the strategic impact assessment, and should allow potentially affected riparian States at least three months to identify relevant issues for inclusion in subsequent preparatory studies and impact assessments;
- during the scoping stage of impact assessments, to allow agreement on mechanisms for sharing technical data and information, and for participation in project-related impact assessments – potentially affected riparian States should respond within three months of the notification;
- prior to selecting an option on a shared river as part of a preferred development plan – potentially affected riparian states

should receive adequate technical information about the proposed project and the results of any impact assessments, and should respond in writing within six months of the notification with their findings and response to the proposed project; and

- as required to cover any additional data and information that is available and necessary for an accurate evaluation by any potentially affected riparian States.

In the event that properly notified riparian States do not respond in a reasonable and timely manner, the notifying State would proceed with planning and development, subject to its observance of the relevant international law principles and the Commission's strategic priorities and policy principles.

In the event that a State fails to notify another riparian State which could potentially suffer significant harm by the proposed action, the potentially affected State should be able to request and receive information, make their views known, including proposing modifications, and be part of a negotiated settlement before any action to construct the dam is taken. If this opportunity is denied, remedies should be available through the International Court of Justice (ICJ), or other appropriate mechanisms. Any external financing for the dam should be conditional upon resolution of the issue as described in Chapter 8 (see policy principle 7.5).

Basin-wide impact assessment

The Commission's Guidelines on *Strategic Impact Assessment* and *Project-Level Impact Assessment*, taken together with prevailing regulatory requirements, provide the framework for a basin-wide assessment of impacts.

Impact assessments designed to suit context-specific situations need to:

- include a participatory basin-wide scoping phase;
- take into consideration the submissions of riparian states and affected communities; and
- be subjected to review by an independent panel agreed upon by all potentially affected riparian states.

All states should give the independent panel access to all necessary information.

Dispute resolution

In the event a dispute cannot be resolved within six months, either through good faith negotiations or independent dispute resolution, it should be referred to a fact-finding commission as detailed in Article 33 of the UN Convention on the Law of the Non-Navigational Uses of International Watercourses. Failing resolution through this body, the dispute should be heard by the ICJ either through case specific agreement or through compulsory jurisdiction in Article 36 of its statute.



Endnotes

- 1 WCD Thematic Review I.2 Indigenous People.
- 2 WCD Thematic Review V.2 Environmental and Social Assessment; WHO, 1999, WCD Working Paper on Human Health; Brandt and Hassan, 2000, WCD Working Paper on Cultural Heritage Management.
- 3 WCD Thematic Review V.2 Environmental and Social Assessment; WHO, op cit; Brandt and Hassan, op cit.
- 4 WCD Thematic Review V.1 Planning.
- 5 Ibid.
- 6 WCD Thematic Review II.2 Global Change.
- 7 WCD Thematic Review III.1 Economic Analysis, Chapter 9.
- 8 WCD Thematic Review III.1 Economic Analysis, Chapter 4.
- 9 WCD Thematic Review III.1 Economic Analysis, Chapters 2, 6, 7, 8.
- 10 WCD Thematic Review IV.5 Operations.
- 11 Brown and King, 1999; Brown et al, 1999, Contributing paper for WCD Thematic Review II.1 Ecosystems.
- 12 WCD Thematic Review II.1 Ecosystems.
- 13 Brown and King, op cit; Brown et al, 1999, Contributing paper for WCD Thematic Review II.1 Ecosystems.
- 14 Bernacsek, 2000, Contributing paper for WCD Thematic Review II.1 Ecosystems.
- 15 WCD Thematic Review V.2 Environmental and Social Assessment.
- 16 WCD Thematic Review I.3 Displacement; Cernea, 2000.
- 17 Scudder, 1997c.
- 18 WCD Thematic Review I.3 Displacement.
- 19 WCD Thematic Review V.4 Regulation.
- 20 Ibid; Wiehen, 1999.