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The Report of the World Commission on Dams (WCD) and its relevance to the Ramsar Convention

Introduction

1. This information paper provides a summary of the work and recommendations of the World Commission on Dams (WCD) and its report *Dams and Development. A New Framework for Decision-Making*, published in 2000. The paper has been prepared by the Scientific and Technical Review Panel (STRP), with the assistance of IUCN, the WCD secretariat, and the secretariat of the Convention on Biological Diversity in response to Resolution VII.18 of the Conference of the Parties, which requested the STRP to report back to COP8 concerning the findings of the WCD and their implications for the future.

2. Of all natural resources, water is amongst the most challenging to manage. Rivers combine the ability to both sustain and to take lives; they have been seen as the object of people's will to "tame and control" nature, whilst also potentially providing cheap, renewable energy through hydropower.

3. To provide water for drinking and agriculture and the generation of energy, over 45,000 large dams (i.e., over 15 meters high) have been built worldwide in the past century. Their construction and its consequences have not been without controversy.

4. Water diversions and abstractions have profoundly affected river flow on a global basis. On almost every continent the natural flow of one or more major rivers has decreased so much that it no longer reaches the sea during the dry season. The modification of rivers has greatly altered river flows, cause flooding, and act on the landscape. In many instances rivers have become disconnected from their floodplains and wetlands. Dams, one the most significant physical impacts on freshwater systems, have slowed water velocity in river systems, converting many of them to chains of connected reservoirs. This fragmentation of freshwater has changed patterns of sediment and nutrient transport, blocked migrations by fish, altered the composition of riparian habitat, created migratory paths for alien species, and contributed to changes in coastal ecosystems. Resettlement of affected local communities and indigenous peoples, as well as the impacts on aquatic and terrestrial ecosystems, have made dam-related issues a microcosm of the impacts of development on people and on the environment.

5. Recent controversies around large dams have led to major opposition to dam construction in many parts of the world, with local, national and international campaigns against them.

Some large dam construction projects have been abandoned by donors despite the pressing development needs of the countries in which they were to be built.

6. The WCD was established to address the issue of "when is a large dam justified, and by what process should that decision be made". In seeking to answer this question, the Commission had to assess experience from around the world, to look in detail at multi-criteria planning methods, participatory approaches, and environmental impact assessments, and to document the different strategies that governments, and dam promoters, had put in place to promote greater transparency, better participation in decision-making, and the achievement of a "triple bottom line" – environmental, economic, and social sustainability.

7. The Commission was established with a unique multi-stakeholder composition and its comprehensive and transparent programme of work actively promoted participation in its process. In this sense the Commission's recommendations represent the middle ground in a debate about the sustainable use of water resources that can often be highly conflictual.

8. To inform its work the Commission drew together an extensive "Knowledge Base" of:

   i) In-depth detailed Case Studies of Dam Projects (8) and countries (3) which analysed the experience of dams through various regions, eras and types;

   ii) 17 Thematic Reviews (plus numerous Contributing Papers) which explored the performance of dams through different lenses, such as options for assessment, social issues, environmental impacts, economic performance or institutional processes;

   iii) A Cross-Check Survey of dams, from a sample of 125, which provides the most comprehensive global statistical survey on large dams to date, drawing on a variety of sources including existing databases;

   iv) Four Regional Consultations, drawing on the experiences of many people from around the world and all walks of life; and

   v) Submissions that were sent in voluntarily to support and substantiate positions of actors in the dams debate.

9. This resource provides an extensive range of information of relevance to the implementation of the Ramsar Convention by its Contracting Parties, notably on the environmental impacts of dams, and documented evidence from around the world on best practice participatory planning approaches, some of which are relevant to decentralised government, others to more centralised planning systems, some of which are more environmentally or socially sensitive than others, but they represent the range of methods currently being used around the world. This can provide a resource to assist implementation of Ramsar's *Guidelines for establishing and strengthening local communities' and indigenous people's participation in the management of wetlands* (Resolution VII.8).

10. The second stage of the Commission's work was to debate and develop guidance to help chart a middle course between the approach used by the dam industry on the one hand (seen as too technocratic and insensitive by the NGO community) and the NGO community (seen by the dam industry as preventing the construction of badly needed

infrastructure and development opportunities). As the Commission was composed of 12 individuals representing views from all sides of the debate, two years was spent debating the best way forward for water resources planning that met the agreement of all members of the Commission. The idea is that the Commission has pre-digested the issues through extensive debate and forcefully argued its case, putting all its proposals clearly into the international legal framework as defined by the Declaration of Human Rights (1948), the Declaration on the Right to Development (1986), and the Rio Declaration (1992).

11. Ramsar Contracting Parties face a similar challenge to that faced by the Commission when seeking the wise use of water resources, and perhaps above all the WCD report provides a reference point that can be drawn upon by all those involved in the planning of water resources, whether involving dams or not.

12. The Commission's report provides non-binding guidance on water resources planning, offers examples of good practice from around the world, and gives assistance in complex issues such as stakeholder identification and involvement, health and environmental impacts or public acceptance through the planning process, and also makes a clear linkage with existing international law. Hence Parties can benefit directly from the Commission's work in seeking a local or national consensus outcome involving NGOs, government, industry, dam managers, and local communities by drawing on global standards as a reference point.

13. The Commission's recommendations (summarised below) include strategic priorities with policy principles, criteria, and guidelines. These may be used, where appropriate, to support the application of existing Ramsar guidance in the 'toolkit' of Wise Use Handbooks, notably those concerning *Integrating wetland conservation and wise use into river basin management* (Handbook 4), *Establishing and strengthening local communities' and indigenous people's participation in the management of wetlands* (Handbook 5), and *Guidelines for international cooperation under the Ramsar Convention on Wetlands* (Handbook 9). Further guidance under consideration by the 8th meeting of the Conference of the Parties will also be relevant to Contracting Parties' consideration of dams and development issues, notably the *Guidelines for the allocation and management of water to maintain the ecological functions of wetlands*, and on impact assessment.

14. Furthermore, since Ramsar's *Classification system for wetland type* includes human-made wetlands, and specifically dams (type 6. Water storage areas; reservoirs/barrages/dams/ impoundments (generally over 8 ha)), existing large dams may qualify for designation as Wetlands of International Importance. To date, of the 1150 Wetlands of International Importance (as at April 2002) 101 Ramsar sites in 39 countries are such water storage areas.

15. The final published 403-page report of the Commission, *Dams and Development. A New Framework for Decision-Making,* provides a synthesis of the Commission's findings and its recommendations. The report is in two parts:

    - Part one contains the results of the Commissions Global Review of Large Dams.

    - Part two presents the Commission's recommendations and a new approach to decision-making, based on the findings in part one.

16. This report, together with the Knowledge Base developed by the Commission and materials concerning the work of the Commission, is also available on CD-ROM and on the WCD Web site (http://www.dams.org).

Summary of Part I: Global Review of Large Dams

17. The Commission assessed the technical, financial, economic, environmental and social performance of large dam, and the review of their alternatives. The review underlines the critical issues relating to governance and compliance that have come to be associated with large dams. In presenting the analysis of the review of experience with large dams, the Commission has not overlooked the substantial benefits derived from dams but rather raises the question of why some dams achieve their goals while others fail.

1. The debate on dams

18. The issues surrounding dams are the same as those surrounding water and how water-related decisions are made, as well as how development effectiveness is assessed. The problems all relate to what the dam will do to river flow and to rights of access to water and river resources; to whether the dam will uproot existing settlements, disrupt the culture and sources of livelihood of local communities, or deplete or degrade environmental resources; and to whether the dam is the best economic investment of public funds and resources.

19. The debate is partly about what occurred in the past and continues to occur today, and partly about what may unfold in the future if more dams are built. The two principal poles in the debate illustrate the range of views on past experience with large dams. One perspective focuses on the gap between the promised benefits of a dam and the actual outcomes. The other view looks at the challenges of water and energy development from a perspective of 'nation building' and resource allocation. Dams, it is argued, have often been selected over other options that may meet water or energy goals at lower cost or that may offer development benefits that are more sustainable and more equitable.

2. Technical, Financial and Economic Performance

20. A considerable number of dams examined by the Commission fall short of physical and economic targets. They almost always took longer to build and cost far more than the original estimates.

3. Environmental Performance

21. Large dams generally have extensive impacts on rivers, watersheds and aquatic ecosystems. The WCD Knowledge Base describes a large number of ecosystems impacts which can be grouped as follow:

- the impacts of reservoirs on terrestrial ecosystems and biodiversity;
- the emission of greenhouse gases associated with large dam projects and their reservoirs;
- the impacts of altered downstream flows on aquatic ecosystems and biodiversity;
- the impacts of altering the natural flood cycle on downstream floodplains;

- the impacts of dams on fisheries in the upstream, reservoir and downstream areas;
- the cumulative impacts of a series of dams on a river system; and
- the enhancement of ecosystems through reservoir creation and other means.

22. The finding and lessons on the environmental impacts of large dams are outlined further in Annex 1.

4. Social performance

23. The review showed that the true economic profitability of large dam projects remains elusive, since the environmental and social costs of large dams were poorly accounted for in economic terms. Social performance of dams is described under the following titles: Displacement of people and livelihood, Indigenous peoples, Down stream livelihoods, Gender, Cultural heritage, Human health, and Equity and distribution of costs and benefits

24. The findings and lessons on the social impacts of large dams are outlined further in Annex 2.

5. Options for water and energy resources development

25. There are a wide range of options and alternatives to large dams for meeting the needs of irrigation, drinking water, electricity, and flood management. In particular situations the cost and feasibility of options will vary in the face of constraints such as natural resource endowments and site location. Obstacles to the adoption of these options range from market barriers to institutional, intellectual and financial barriers.

26. A number of supply-side options at all scales (ranging from small, distributed generation sources or localised water collection and water-recovery systems to regional-interconnection of power grids) have emerged which, on their own or collectively, can improve or expand the delivery of water and energy services in a timely, cost-effective, and publicly acceptable manner.

27. Decentralised, small-scale options (micro hydro, home-scale solar electric systems, wind and biomass systems) based on local renewable sources offer an important near-term, and possibly long-term potential, particularly in rural areas far away from centralised supply networks.

6. Decision-making, planning and compliances

28. The decisions to build a dam are influenced by many variables beyond immediate technical considerations. Conflicts over dams have heightened in the past two decades due largely to the social and environmental impacts of dams that were either disregarded in the planning process or unanticipated. However, it also stems from the failure by dam proponents and financing agencies to fulfil commitments made to observe statutory regulations and abide by internal guidelines.

Summary of Part II: Recommendations proposed by the World Commission on Dams

29. The Commission set out not only to undertake a global review of the development effectiveness of large dams, but also to propose a new decision-making framework based on a rights and risks approach, and supported by existing good practice around the world. All of the Commission's recommendations are founded in current practice and they provide a comprehensive set of criteria and guidelines that can assist, in a practical way, the achievement of sustainable development and wise use of water and energy resources.

30. In its report, the Commission recognizes that within today's diverse world a "one size fits all" approach is unrealistic. The Commissions guidelines are "advisory tools to support decision-making" and will require to be adapted to local and national contexts.

31. The report introduces a holistic approach to addressing challenges facing the world in management of fresh water resources, and undertakes its analysis through a normative framework that draws on UN declarations concerning human rights (1949) and the right to development (1986), and on the Rio Declaration on Environment and Development (1992). The Commission's overall conclusions about large dams are therefore grounded in a basic understanding about the relationships between water, dams and development, and its recommendations provide practical steps towards a rights-based approach in implementing sustainable development on the ground. The Commission specifically refers also to the Ramsar Convention and to the Convention on Biological Diversity as giving appropriate guidance on meeting sustainability objectives and for sustaining lives and livelihood.

32. Recommendations of the World Commission on Dams are designed to help put into practice a new approach to planning and decision-making. Recommendations include seven strategic priorities and policy principles, five key stages in decision-making, and 26 interlinked guidelines.

33. At each stage of key decision-making there are cross-references to guidelines. Table 1 summarises the relationship between Strategic Priorities, Guidelines, Key stages in decision-making and cross-references to guidelines.

TABLE 1. STRATEGIC PRIORITIES, GUIDELINES, KEY STAGES IN DECISION-MAKING, AND CROSS-REFERENCES TO GUIDELINES IN THE REPORT OF THE WORLD COMMISSION ON DAMS.

Strategic priorities	**Guidelines**	**Key stages in decision-making**					
		Needs assessment	*Selecting alternatives*	*Investigative studies*	*Project preparation*	*Project implementation*	*Project operation*
1- Gaining public acceptance	1-Stakeholder analysis	x	x	x	x	x	x
	2- Negotiated decision-making processes			x	x	x	
	3- Free, prior and informed consent			x	x		
2- Comprehensive options assessment	4- Strategic impact assessment for environmental, social, health and cultural heritage issues		x				
	5- Project-level impact assessment for environmental, social, health and cultural heritage issues			x			
	6- Multi-criteria analysis			x			
	7- Life cycle assessment			x			
	8- Greenhouse gas emissions			x			
	9- Distributional analysis of projects			x			
	10- Valuation of social and environmental impacts			x			
	11- Improving economic risk assessment			x			
3- Addressing existing dams	12- Ensuring operating rules reflect social and environmental concerns				x		
	13- Improving reservoir operations						x
4- Sustainable rivers and livelihoods	14- baseline ecosystem surveys	x	x	x			
	15- Environmental flow assessment	x	x	x			x

Strategic priorities	**Guidelines**	**Key stages in decision-making**					
		Needs assessment	*Selecting alternatives*	*Investigative studies*	*Project preparation*	*Project implementation*	*Project operation*
	16- Maintaining productive fisheries			x			
5- Recognizing entitlements and sharing benefits	17- Baseline social conditions			x			
	18- Impoverishment risk analysis						
	19- Implementation of the mitigation, resettlement and development action plan				x	x	x
	20- Project benefit-sharing mechanisms			x	x		x
6- Ensuring compliance	21- Compliance plans				x	x	
	22- Independent review panels for social and environmental matters				x	x	
	23- Performance bonds				x		x
	24- Trust funds				x		
	25- Integrity pacts				x		
7- Sharing rivers for peace, development, and security	26- Procedures for shared rivers			x	x		

34. The first two key stages in decision-making (needs assessment, and selecting alternatives and investigative studies) relate to planning, leading to decisions on a preferred development plan. When a dam emerges from this process as a preferred development alternative, three further critical decision points (project preparation, implementation, and operation) occur.

35. The Commission's framework for decision-making is based on five core values: equity, sustainability, efficiency, participatory decision-making, and accountability. The framework proposes:

1) Right-and-risks approach

36. A rights-and-risks approach is a practical and principled basis for identifying all legitimate stakeholders in negotiating development choices and agreements. The approach developed by the Commission of recognizing rights and assessing risks (particularly rights at risk) in the planning and project cycles offers a means to apply these core values to decision-making about water and energy resource management. The assessment of risk adds an important dimension to understanding how, and to what extent, a project may impact on people's rights. Risk must be identified and addressed explicitly. This will require the notion of risk to be extended beyond governments or developers to include both those affected by a project and the environment as a public good.

2) Seven Strategic Priorities and corresponding policy principles

37. The seven strategic priorities for water and energy resources development are: gaining public acceptance, comprehensive options assessment, addressing existing dams, sustaining rivers and livelihoods, recognizing entitlements and sharing benefits, ensuring compliance, and sharing rivers for peace, development and security.

38. The strategic priorities recommended by the Commission lie within a broad framework of existing and emerging policy and regulation at local, national and international levels and should guide decision-making. Each strategic priority includes a set of principles that, if applied, will lead to more equitable and sustainable outcomes in future. Effective implementation of each strategic priority depends on applying certain policy principles. The policy principles for each strategic priority are listed in Annex 3.

3) New approach to planning and decision-making

39. Turning the above priorities and their underlying principles into reality requires a new focus for planning and management in the water and energy sectors. This can best be achieved by focusing on the key stages in decision-making that influence final outcomes and where compliance with regulatory requirements can be verified.

40. The Commission has identified five critical decision points when water and energy options are considered. Each of the five decision points represents a commitment to actions that govern the course of future conduct and the allocation of resources. They are points where ministries and government agencies need to test compliance with preceding processes before giving the green light to proceed to the next stage. Annex 4 lists the key stages in decision-making.

4) Criteria and guidelines

41. The Commission provides a framework that emphasizes a structured process incorporating the full range of social, environmental, technical, economic and financial criteria and standards. Criteria and guidelines for good practice relate to the strategic priorities, ranging from life-cycle and environmental flow assessments to impoverishment risk analysis and integrity pacts. Associated with the guidelines are criteria which translate the Commission's policy principles into a programme for implementation.

42. The guidelines 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.

43. 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 (see Table 1).

Annex 1

Findings and lessons on environmental impacts of large dams

1. Large dams generally have extensive impacts on rivers, watersheds and aquatic ecosystems. From the WCD Knowledge Base it is clear that large dams have led to:

   - the loss of forests and wildlife habitat, the loss of species populations and the degradation of upstream catchment areas due to inundation of the reservoir area;
   - emissions of greenhouse gases from reservoirs due to the rotting of vegetation and carbon inflows from the basin;
   - the loss of aquatic biodiversity, upstream and downstream fisheries, and the services of downstream floodplains, wetlands and riverine estuarine and adjacent marine ecosystems;
   - the creation of productive fringing wetland ecosystems with fish and waterfowl habitat opportunities in some reservoirs; and
   - cumulative impacts on water quality, natural flooding, and species composition where a number of dams are sited on the same river.

2. The ecosystem impacts are more negative than positive and they have led, in many cases, to irreversible loss of species and ecosystems. In the Cross-Check Survey 67% of the ecosystem impacts recorded were negative.

3. Efforts to date to mitigate the ecosystem impacts of large dams have met with limited success owing to the lack of attention given to anticipating and avoiding impacts, the poor quality and uncertainty of predictions, the difficulty of coping with all impacts, and the only partial implementation and success of mitigation measures. More specifically:

   - It is not possible to mitigate many of the impacts of reservoir creation on terrestrial ecosystems and biodiversity, and efforts to 'rescue' wildlife have met with little sustainable success.
   - The use of fish passes to mitigate the blockage of migratory fish has had little success, as the technology has often not been tailored to specific sites and species.
   - Good mitigation results from a good information base; early cooperation between ecologists, the dam design team, and affected people; and regular monitoring and feedback on the effectiveness of mitigation measures.
   - Environmental flow requirements (which include managed flood releases) are increasingly used to reduce the impacts of changed stream flow regimes on aquatic, floodplain and coastal ecosystems downstream.

- Avoidance or minimisation of ecosystem impacts can be achieved through legislative or policy measures that set aside particular river segments or basins, or through good site selection (such as avoiding main stem dams).

4. Finally, a number of countries, particularly the United States, are making efforts to restore ecosystem function and native fish populations by decommissioning large and small dams.

Technical contributing papers to World Commission on Dams thematic review on ecosystems issues, and contained in the Commission's Knowledge Base, include:

Contributing Paper/ Synthesis Paper	**Author(s)**
Molluscan Biodiversity and the Impact of Large Dams	Mary.B. Seddon (*National Museum & Galleries of Wales, UK*)
The Influence of Dams on River Fisheries	Donald C. Jackson (*Mississippi State University, USA*) & Gerd Marmulla (*Fisheries Department, UN Food and Agriculture Organisation, Rome*)
Ecosystem Impacts of Large Dams	M.P. McCartney, C. Sullivan & M.C. Acreman (*Institute of Hydrology, UK*)
Biodiversity Impacts of Large Dams	Don E. McAllister (*Consultant on biodiversity*), John Craig (*Consultant on Fish and Fisheries*), Nick Davidson (*Wetlands International, Netherlands*), Mary Seddon (*National Museum of Wales, UK*) & Dianne Murray (*OPIRG, Carleton University, Canada*
Large Dams and Freshwater Fish Biodiversity	J F Craig (*Whiteside, Dunscore, UK*)
Definition and Implementation of Instream Flows	Jackie King, Rebecca Tharme & Cate Brown (*University of Cape Town, South Africa*)
Information Needs for Appraisal and Monitoring of Ecosystem Impacts	Jackie King & Cate Brown (*University of Cape Town, South Africa*)
Dams and Fish Migration	Michel Larinier (*Institut de Mecanique des Fluides, Toulouse, France*)
Biodiversity Impacts of Large Dams: Waterbirds	Nick Davidson & Simon Delany (*Wetlands International, Netherlands*)
Fundamental Legal and Ethical Principles In Adjudging the Merits of Development Projects	Charles Di Leva (*IUCN Environmental Law Center, Bonn, Germany*)

Annex 2

Findings and lessons on the social impacts of large dams

1. Past decision-making and planning efforts have often neither adequately assessed nor accounted for the adverse social impacts of large dams. As a result, the construction and operation of large dams has had serious and lasting effects on the lives, livelihoods and health of affected communities, and has led to the loss of cultural resources and heritage.

2. At the same time, a simple accounting for the direct benefits provided by large dams – the provision of irrigation water, electricity, municipal and industrial water supply, and flood control – often fails to capture the full set of social benefits associated with these services. It also misses a set of ancillary benefits and indirect economic (or multiplier) benefits of dam projects.

3. The WCD Knowledge Base provides the following findings on the adverse impacts of the displacement of people from their homes and livelihood by large dams:

   - Forty to eighty million people have been physically displaced by dams worldwide.

   - Millions of people living downstream from dams – particularly those reliant on natural floodplain function and fisheries – have also suffered serious harm to their livelihoods and had the future productivity of their resources put at risk.

   - Many of the displaced people were not recognized (or enumerated) as such, and therefore were not resettled or compensated.

   - Where compensation was provided it often proved inadequate, and where the physically displaced were enumerated, many were not included in resettlement programmes;

   - Those who were resettled have rarely had their livelihoods restored, as resettlement programmes have focused on physical relocation rather than on the economic and social development of the displaced;

   - Even in the 1990s, impacts on downstream livelihoods were not adequately assessed or accounted for in the planning and design of large dams; and

   - There is a clear relationship between the magnitude of displacement and the ability to rehabilitate and restore livelihoods adequately – the larger the number of displaced people, the less likely it is that livelihoods can be restored.

4. In summary, the WCD Knowledge Base demonstrates a generalised lack of commitment or lack of capacity to cope with displacement.

5. Large dams in the WCD Knowledge Base have also had significant adverse effects on cultural heritage through the loss of cultural resources of local communities and the

submergence and degradation of plant and animal remains, burial sites, and archaeological monuments.

6. The WCD Knowledge Base indicates that the poor, other vulnerable groups, and future generations are likely to bear a disproportionate share of the social and environmental costs of large dam projects without gaining a commensurate share of the economic benefits. Specific cases include:

   - Indigenous and tribal peoples and vulnerable ethnic minorities have suffered disproportionate levels of displacement and negative impacts on livelihood, culture and spiritual existence.

   - Affected populations living near reservoirs, displaced people, and downstream communities have often faced adverse health and livelihood outcomes from environmental change and social disruption; and

   - Among affected communities, gender gaps have widened and women have frequently borne a disproportionate share of the social costs and were often discriminated against in the sharing of benefits.

7. These inequitable outcomes documented in the WCD Knowledge Base invalidate the prevailing 'balance-sheet' approach to decision-making. The balancing of gains and losses as a way of judging the merits of a large dam project – or selecting the best option – is not acceptable where the mismatch between who gain from the benefits and those who pay the costs is of such a serious, pervasive, and sometimes irreversible nature.

8. The review also shows that the true economic profitability of large dam projects remains elusive since the environmental and social costs of large dams were poorly recognized, and failures to account adequately for these impacts and to fulfil commitments that were made have led to the impoverishment and suffering of millions, giving rise to growing opposition to dams by affected communities worldwide. However, innovative examples of processes for making reparations and sharing project benefits are emerging, and these provide the basis for optimism that past injustices can be remedied and future ones avoided.

Annex 3

Strategic priorities and policy principles

Effective implementation of each strategic priority depends on applying the relevant policy principles.

Strategic priority 1- Gaining public acceptance

Public acceptance of key decisions is essential for equitable and sustainable water and energy resources development. Acceptance emerges from recognizing rights, addressing risks, and safeguarding the entitlements of all groups of affected people, particularly indigenous and tribal peoples, women and other vulnerable groups. Decision-making processes and mechanisms are used that enable informed participation by all groups of people, and result in the demonstrable acceptance of key decisions. Where projects affect indigenous and tribal peoples, such processes are guided by their free, prior and informed consent.

Policy principles:

1.1 Recognition of rights and assessment of risks are the basis for the identification and inclusion of stakeholders in decision-making on energy and water resources development.
1.2 Access to information, legal and other support is available to all stakeholders, particularly indigenous and tribal peoples, women and other vulnerable groups, to enable their informed participation in decision-making process.
1.3 Demonstrable public acceptance of all key decisions is achieved through agreements negotiated in an open and transparent process conducted in good faith and with the informed participation of all stakeholders.
1.4 Decisions on projects affecting indigenous and tribal peoples are guided by their free, prior and informed consent achieved through formal and informal representative bodies.

Strategic priority 2- Comprehensive options assessment

Alternatives to dams often do exist. To explore these alternatives, needs for water, food and energy are assessed and objectives clearly defined. The appropriate development response is identified from a range of possible options. The selection is based on a comprehensive and participatory assessment of the full range of policy, institutional and technical options. In the assessment process, social and environmental aspects have the same significance as economic and financial factors. The options assessment process continues through all stages of planning, project development and operations.

Policy principles:

2.1 Development needs and objectives are clearly formulated through an open and participatory process before the identification and assessment of options for water and energy resource development.
2.2 Planning approaches that take into account the full range of development objectives are used to assess all policy, institutional, management, and technical options before the decision is made to proceed with any programme or project.

2.3 Social and environmental aspects are given the same significance as technical, economic and financial factors in assessing options.
2.4 Increasing the effectiveness and sustainability of existing water, irrigation, and energy systems are given priority in the options assessment process.
2.5 If a dam is selected through such a comprehensive options assessment process, social and environmental principles are applied in the review and selection of options throughout the detailed planning, design, construction, and operation phases.

Strategic priority 3- Addressing existing dams

Opportunities exist to optimise benefits from many existing dams, address outstanding social issues, and strengthen environmental mitigation and restoration measures. Dams and the context in which they operate are not seen as static over time. Benefits and impacts may be transformed by changes in water use priorities, physical and land use changes in the river basin, technological developments, and changes in public policy expressed in environment, safety, economic and technical regulations. Management and operation practices must adapt continuously to changing circumstances over the project's life and must address outstanding social issues.

Policy principles:

3.1 A comprehensive post-project monitoring and evaluation process, and a system of longer-term periodic reviews of the performance, benefits, and impacts for all existing large dams are introduced.
3.2 Programmes to restore, improve and optimize benefits from existing large dams are identified and implemented. Options to consider include rehabilitate, modernise and upgrade equipment and facilities, optimise reservoir operations, and introduce non-structural measures to improve the efficiency of delivery and use of services.
3.3 Outstanding social issues associated with existing large dams are identified and assessed; processes and mechanisms are developed with affected communities to remedy them.
3.4 The effectiveness of existing environmental mitigation measures is assessed and unanticipated impacts identified; opportunities for mitigation, restoration and enhancement are recognized, identified and acted upon.
3.5 All large dams have formalised operating agreements with time-bound licence periods. Where re-planning or relicensing processes indicate that major physical changes to facilities or decommissioning may be advantageous, a full feasibility study and environmental and social impact assessment is undertaken.

Strategic priority 4- Sustaining rivers and livelihoods

Rivers, watersheds and aquatic ecosystems are the biological engines of the planet. They are the basis for life and the livelihoods of local communities. Dams transform landscapes and create risks of irreversible impacts. Understanding, protecting and restoring ecosystems at river basin level is essential to foster equitable human development and the welfare of all species.

Options assessment and decision-making around river development emphasizes the avoidance of impacts, followed by the minimization and mitigation of harm to the health and integrity of the river system. Avoiding impacts through good site selection and project design is a priority. Releasing tailor-made environmental flows can help to maintain downstream ecosystems and the communities that depend upon them.

Policy principles:

4.1 A basin-wide understanding of the ecosystem's functions, values and requirements, and how community livelihoods depend upon and influence them, is required before decisions on development options are made.
4.2 Decisions value ecosystems, social, and health issues as an integral part of project and river basin development and emphasize avoidance of impacts in accordance with a precautionary approach.
4.3 A national policy is developed for maintaining selected rivers with high ecosystem functions and values in their natural state. When reviewing alternative locations for dams on undeveloped rivers, priority is given to locations on tributaries.
4.4 Project options are selected that avoid significant impacts on threatened and endangered species. When impacts cannot be avoided viable compensation measures are put in place that will result in a net gain for the species within the region.
4.5 Large dams provide for releasing environmental flows to help maintain downstream ecosystem integrity and community livelihoods and are designed, modified and operated accordingly.

Strategic priority 5- Recognizing entitlements and sharing benefits

Joint negotiations with adversely affected people result in mutually agreed and legally enforceable mitigation and development provisions. These provisions recognize entitlements that improve livelihoods and quality of life, and affected people are beneficiaries of the project. Successful mitigation, resettlement and development are fundamental commitments and responsibilities of the State and the developer. They bear the onus to satisfy all affected people who moving from their current context and resources will improve their livelihoods. Accountability of responsible parties to agreed mitigation, resettlement and development provisions is ensured through legal means, such as contracts, and through accessible legal recourse at national and international level.

Policy principles:

5.1 Recognition of rights and assessment of risks is the basis for identification and inclusion of adversely affected stakeholders in joint negotiations on mitigation, resettlement and development related decision-making.
5.2 Impact assessment includes all people in the reservoir, upstream, downstream and in catchment areas whose properties, livelihoods, and non-material resources are affected. It also includes those affected by dam-related infrastructure such as canals, transmission lines, and resettlement developments.
5.3 All recognized adversely affected people negotiate mutually agreed, formal and legally enforceable mitigation, resettlement, and development entitlements.
5.4 Adversely affected people are recognized as first among the beneficiaries of the project. Mutually agreed and legally protected benefit sharing mechanisms are negotiated to ensure implementation.

Strategic priority 6- Ensuring compliance

Ensuring public trust and confidence requires that governments, developers, regulators and operators meet all commitments made for the planning, implementation, and operation of dams. Compliance with applicable regulations, with criteria and guidelines, and with project-specific

negotiated agreements is secured at all critical stages in project planning and implementation. A set of mutually reinforcing incentives and mechanisms is required for social, environ-mental and technical measures. These should involve an appropriate mix of regulatory and non-regulatory measures, incorporating incentives and sanctions. Regulatory and compliance frameworks use incentives and sanctions to ensure effectiveness where flexibility is needed to accommodate changing circumstances.

Policy principles:

6.1 A clear, consistent and common set of criteria and guidelines to ensure compliance is adopted by sponsoring, contracting and financing institutions and compliance is subject to independent and transparent review.
6.2 A Compliance Plan is prepared for each project prior to commencement, spelling out how compliance will be achieved, with relevant criteria and guidelines and specifying binding arrangements for project-specific technical, social and environmental commitments.
6.3 Costs for establishing compliance mechanisms and related institutional capacity, and their effective application, are built into the project budget.
6.4 Corrupt practices are avoided through enforcement of legislation, voluntary integrity pacts, debarment, and other instruments.
6.5 Incentives that reward project proponents for abiding by criteria and guidelines are developed by public and private financial institutions.

Strategic priority 7- Sharing rivers for peace, development, and security

Storage and diversion of water on transboundary rivers has been a source of considerable tension between countries and within countries. As specific interventions for diverting water, dams require constructive cooperation. Consequently, the use and management of resources increasingly becomes the subject of agreement between States to promote mutual self-interest for regional cooperation and peaceful collaboration. This leads to a shift in focus from the narrow approach of allocating a finite resource to the sharing of rivers and their associated benefits in which States are innovative in defining the scope of issues for discussion. External financing agencies support the principles of good faith negotiations between riparian States.

Policy principles:

7.1 National water policies make specific provision for basin agreements in shared river basins. Agreements are negotiated on the basis of good faith among riparian States. They are based on principles of equitable and reasonable utilisation, no significant harm, prior information and the Commission's strategic priorities.
7.2 Riparian States go beyond looking at water as a finite commodity to be divided and embrace an approach that equitably allocates not the water, but the benefits that can be derived from it. Where appropriate, negotiations include benefits outside the river basin and other sectors of mutual interest.
7.3 Dams on shared rivers are not built in cases where riparian States raise an objection that is upheld by an independent panel. Intractable disputes between countries are resolved through various means of dispute resolution including, in the last instance, the International Court of Justice.
7.4 For the development of projects on rivers shared between political units within countries, the necessary legislative provision is made at national and sub-national levels to embody

the Commission's strategic priorities of 'gaining public acceptance', recognizing entitlements' and 'sustaining rivers and livelihoods'.

7.5 Where a government agency plans or facilitates the construction of a dam on a shared river in contravention of the principle of good faith negotiations between riparians, external financing bodies withdraw their support for projects and programmes promoted by that agency.

Annex 4

Key stages in decision making

The first two key stages relate to planning, leading to decisions on a preferred development plan:

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

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

Key Stage 2. **Selecting alternatives** - identifying the preferred development plan from among the full range of options

> *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.

Key Stage 2A. **Investigative studies** - The results of the study, including any outstanding issues, will be fed back into screening and ranking exercise (stage 2- selecting 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.

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

Key Stage 3. **Project preparation** - verifying that agreements 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.

Key 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 license is confirmed, including specific requirements for monitoring, periodic review, and adaptive management.

Key Stage 5. **Project operation** - adapting to changing contexts

Intended outcome: Conditions for operating under the license are fulfilled and the license 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.