Joint Initiative on

Rapid Basin-wide Hydropower Sustainability Assessment Tool

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Rapid Basin-wide Hydropower Sustainability Assessment Tool (RSAT)

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The Rapid Basin-wide Hydropower Sustainability Assessment Tool (RSAT) is a product of several years of conceptualization, preparation, and stakeholder engagement in the Mekong region. The initial exchange of ideas, which gave rise to the notion of a basin-wide hydropower sustainability assessment tool, date back to 2001. This later evolved into a partnership initiative known as the Environmental Considerations for Sustainable Hydropower Development (ECSHD), formed in 2006 by the Asian Development Bank (ADB), the Mekong River Commission (MRC), and the World Wide Fund for Nature (WWF).

This version of RSAT is the outcome of collaboration between the ECSHD partners and the Environmental Cooperation-Asia (ECO-Asia) project of the United States Agency for International Development (USAID), which contracted with Hydro Tasmania Consulting (HTC) to help prepare the RSAT for implementation in the Mekong River Basin.

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Abbreviations and Acronyms

ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
BDP	Basin Development Plan
CDM	Clean Development Mechanism
CIA	Cumulative Impact Assessment
DSMS	Dam Safety Management System
ECO-Asia	Environmental Cooperation-Asia
ECSHD	Environmental Considerations for Sustainable Hydropower Development
EFA	Environmental Flow Assessment
EIA	Environmental Impact Assessment
EPP	Emergency Preparedness Plan
HSAF	Hydropower Sustainability Assessment Forum
H-SAP	Hydropower Sustainability Assessment Protocol
IHA	International Hydropower Association
IRBM	Integrated River Basin Management
IWRM	Integrated Water Resource Management
MOU	Memorandum of Understanding
MRC	Mekong River Commission
PES	Payment for Ecological Services
PDA	Power Development Agreement
PPA	Power Purchase Agreement
RBO	River Basin Organization
RBC	River Basin Committee
RSAT	Rapid Basin-wide Hydropower Sustainability Assessment Tool
SEA	Strategic Environmental Assessment
WCD	World Commission on Dams
WWF	World Wide Fund for Nature
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development

Preface

The Environmental Considerations for Sustainable Hydropower Development (ECSHD) is an initiative established in 2006 to develop tools that will assist decision making for sustainable hydropower development in the Mekong River Basin. It considers sustainable hydropower from the perspective of all stages of the project-cycle from planning and design through operations. The taskforce consists of the Asian Development Bank (ADB), Mekong River Commission (MRC) and World Wide Fund for Nature (WWF).

Environmental Cooperation-Asia (ECO-Asia), a regional project of the United States Agency for International Development (USAID), worked with ECSHD to assist in the development of a Rapid Basin-wide Hydropower Sustainability Assessment Tool (RSAT). In January 2010, ECO-Asia engaged Hydro Tasmania Consulting (HTC) to assist with the development of the RSAT in collaboration with ECSHD partners. The first draft of the RSAT was tested in Vientiane in May 2010 in an ECSHD sponsored workshop. In July 2010 Revision 2 of the RSAT was tested in a two day multi-stakeholder regional workshop for the 3S transboundary river basin. Also, in July 2010, Revision 2 of the RSAT was presented to the Technical Review Group (TRG) of the MRC for review and endorsement. The TRG provided valuable input and support for the RSAT to progress to Revision 3.

The work conducted by HTC in the development of the tool drew upon previous work by the ECSHD partners to bring basin-wise and sub-basin considerations into hydropower sustainability assessments as well as the 2009 Draft Hydropower Sustainability Assessment Protocol (H-SAP) prepared by the Hydropower Sustainability Assessment Forum (HSAF) working with the International Hydropower Association (IHA).

Part 1: Main Document

1. Introduction

1.1 Background

There is a resurgence of interest in hydropower as a result of the need for low carbon economies, energy security and improved water management to meet the challenges of climate change. This interest is focused on the lesser developed basins of the world located in developing countries where the greatest potential for hydropower development remains. The rapid pace of hydropower development in these basins presents a significant challenge to national governments responsible for the management of river basins already under pressure from many competing needs. These lesser developed basins are often characterised by high levels of poverty and a high dependence on natural resources for livelihoods of the basin's population. Whilst hydropower presents significant opportunities for the alleviation of poverty and the economic development of nations it is widely acknowledged that it also can bring significant social and environmental risks.

Sustainable development calls for considering synergies and trade-offs amongst economic, social and environmental values. A balance between social, environmental and economic values should be achieved and ensured in a transparent and accountable manner, taking advantage of expanding knowledge, multiple perspectives and innovation. The World Commission on Dams (WCD) report –Dams and Development; A New Framework for Decision Making– was published in 2000. It highlighted the risks associated with hydropower development and presented a new framework for decision making.

1.2 Principles for sustainable hydropower

Sustainable development is commonly defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Report of the World Commission on Environment and Development 1987). Sustainable development requires the integration of three components: economic development, social development and environmental protection as interdependent, mutually reinforcing pillars. Eradicating poverty, respecting human rights, changing unsustainable patterns of consumption and production and protecting the natural resource base underpinning economic and social development are overarching objectives of and essential requirements for sustainable development.

The Rapid Basin-wide Hydropower Sustainability Assessment Tool (RSAT) embodies the principles of sustainable development of hydropower drawing upon previous work by the WCD and the International Hydropower Association (IHA). There is broad international

agreement on the objectives of the WCD Report's seven strategic priorities. The seven strategic priorities are:

- Gaining public acceptance;
- Comprehensive options assessment;
- Addressing existing dams;
- Sustaining rivers and livelihoods;
- Recognising entitlements and sharing benefits;
- Ensuring compliance; and
- Sharing rivers for peace, development and security.

The IHA produced Sustainability Guidelines in 2004 in response to the WCD report. In September 2010, the IHA published the Draft Final Recommended Hydropower Sustainability Assessment Protocol (H-SAP), the result of the collaborative and consultative work of the Hydropower Sustainability Assessment Forum (HSAF). The methodology and format used for the RSAT was drawn in part from earlier work of the HSAF.

1.3 Key themes of hydropower sustainability that this tool addresses

The RSAT (hereafter, the assessment tool) does not comprise an exhaustive list of all basin-wide hydropower sustainability issues. It was designed to target the most important issues and assist with dialogue and planning between key players. The tool places emphasis throughout on particular key themes of sustainability that are necessary for a basin-wide approach to sustainable hydropower development. These key themes are discussed below and form the primary basis for the scoring statements throughout the assessment tool.

1.3.1 Continuous improvement

One of the key principles of sustainable development is that of continuous improvement. The standards for sustainable development have changed and evolved over time. Expectations in today's world are different from the expectations and standards of the past. Projects that have been developed in the past are the products of their day and it is often a challenge to build sustainability into existing projects when they have been developed with different expectations. Continuous improvement involves incorporating the lessons learned from past unsustainable practices into current practices. The assessment tool is designed to identify which areas of sustainability performance require attention in a basin and to emphasise the need for continuous improvement as part of the hydropower development and basin planning processes. A separate continuous improvement scoring statement has

been developed and can be applied to any criterion. It can be used to demonstrate whether continuous improvement in the sustainability performance of basin planning and hydropower development is being achieved over time.

1.3.2 Basin-wide understanding and protection of values

The assessment tool is based on the principle that hydropower development can only be sustainable if development decisions are made within the context of a basin-wide comprehensive understanding of the social, cultural, socio-economic and environmental values of the basin and how they interact with each other at the local and basin scale. Sustainable hydropower development aims to ensure no net loss of these values across a basin to contribute to their enhancement and protection and the alleviation of poverty.

1.3.3 Integration between basin planning and hydropower development regulatory and management frameworks

The assessment tool is based on the principle that sustainable hydropower development in a basin requires a high level of integration between the river basin planning and the hydropower development management and regulatory frameworks. The two frameworks need to be integrated and underpinned by sustainability principles and there needs to be a strong emphasis on the effective implementation of the plans and programs that arise from the policies and regulations.

1.3.4 Co-operation between different countries sharing a river basin

The assessment tool is based on the principle that sustainable hydropower development in a shared river basin calls for a high level of co-operation between the different national governments sharing a basin as well as the different levels of government at the sub-national and local levels. This co-operation between governments needs to be underpinned by a shared vision for sustainable and equitable development across the basin.

1.3.5 Balance of social and environmental criteria with economic and technical criteria in decision making processes

The assessment tool is based on the principle that in all of the various decision making processes at the different hydropower development stages (options assessment, site selection, project preparation, construction, operation and decommissioning) environmental, socio-economic and socio-cultural criteria need to be given equal weighting to economic and technical criteria. Trade-offs and synergies between the different criteria need to be made openly and transparently.

1.3.6 Consistency in approaches across a river basin

The assessment tool is based on the principle that approaches to sustainable hydropower development across a river basin need to be consistent for the objectives of equitable and sustainable development to be achieved. Consistency in approaches requires co-operation and communication between different developers, operators and other water resource users in a basin.

1.3.7 Informed participation of stakeholder in decision making and broad community support

The assessment tool is based on the principle that sustainable hydropower development will be based on a process of informed participation of stakeholders in the basin at all stages of development decision making and that affected communities will have an integral role in planning and decision making on issues that affect them directly. Sustainable hydropower development will also have the broad community support of the basin population.

1.4 Climate change – a cross-cutting issue

The assessment tool does not have specific topics or criteria that address climate change. Climate change is considered to be a cross-cutting issue for hydropower sustainability and is incorporated into a number of topics and criteria. It is addressed in most topics as a need for adaptive management to future (climate change) scenarios.

1.5 The topics and criteria used in the assessment

The assessment tool consists of a series of 11 topics and 53 criteria against which hydropower sustainability is assessed. Table 1 below provides the full list of topics and criteria.

Table 1: Summary of Topics and Criteria

Topics	Criteria
1: Hydropower and economic development in the basin/sub-basin	1.1 Relative contribution of hydropower to national economies
	1.2 Relative contribution of hydropower to local economies
	1.3 Synergies and trade-offs with other economic sectors in the basin (upstream and downstream)
	1.4 Multiple water use optimisation
2: Hydropower and social and cultural well-being in the basin/sub-basin	2.1 Cultural values and non-material uses of resources
	2.2 Protection of livelihoods and land and water access rights and entitlements
	2.3 Involuntary re-settlement
	2.4 Hydropower and poverty reduction
	2.5 Hydropower and equitable social advancement
3: Hydropower and environmental quality and natural resources management in the basin/sub-basin	3.1 Understanding and protection of basin-wide ecosystem integrity
	3.2 Management of hydropower environmental impacts
	3.3 Protection of high value rivers from development
	3.4 Hydropower impact on sustainable use of natural resources
	3.5 Impact on river morphology, erosion and sedimentation
	3.6 Monitoring changes to environmental quality as a result of hydropower
4: Options assessment and alignment with national, regional and international agreements, policies and plans	4.1 Options assessment for water and energy services in the basin or export revenue
	4.2 Alignment with regional and international agreements, policies, plans and national commitments for basin development
	4.3 Alignment with integrated water resource management (IWRM) planning in the basin
5: The co-ordination and optimisation of site selection and design, implementation and operations for multiple projects in a basin or cascade	5.1 Multi-criteria assessment for site selection and optimisation for multiple projects in a basin or cascade
	5.2 Protection of unique biodiversity/habitat and culturally significant sites in hydropower site selection and design
	5.3 Co-ordination of planning for hydropower implementation in a basin with multiple projects
	5.4 Co-ordination of planning for operations within a system of multiple reservoirs or cascade
6: Environmental flows and downstream regulation	6.1 Environmental flow assessment (EFA)
	6.2 Structural provision and operational procedures for sediment management and sediment flushing during all project stages
	6.3 Structural provision and operational procedures for downstream flow regulation including transboundary considerations
	6.4 Flood and drought management and floodplain protection
	6.5 Maintaining the flow of nutrient rich silt
	6.6 River transport and navigation locks
7: Fish passage and fisheries management	7.1 Understanding and monitoring of fisheries resources
	7.2 Policy, regulations and practices for fish management in hydropower
	7.3 Structural and operational provision for fish passage
	7.4 Protection of upstream and downstream fisheries and development of reservoir fisheries

Topics	Criteria
8: Sharing of benefits and use of innovative financing measures for sustainability (local and transboundary)	8.1 Sharing of project benefits
	8.2 Equitable water resource allocation between sectors and countries
	8.3 Payment for ecological services (PES)
	8.4 Carbon financing opportunities to fund sustainability measures
	8.5 Project revenue to fund sustainability measures
9: Provision for safety and disaster prevention and management	9.1 Dam safety management system (DSMS)
	9.2 Consistency across basin/cascade
	9.3 Emergency preparedness plans (EPP) and co-ordination
	9.4 Dam break and other analysis prepared for projects in cascades
	9.5 Emergency flood management
10: National and basin-wide institutional setting	10.1 Sustainable hydropower – roles and allocation of responsibility
	10.2 Co-ordination mechanisms between key stakeholders
	10.3 Transboundary notification, conflict resolution and communication
	10.4 Monitoring, review and compliance provisions
	10.5 Sustainability principles in hydropower agreements
	10.6 Capacity building plans for key agencies and River Basin Organisations and Committees (RBO/RBC)
11: Communication, basin stakeholder and community involvement and support for hydropower development	11.1 Strategic communication and awareness of sustainable hydropower – principles and practices
	11.2 Informed participation and representation in hydropower decision making at all stages of the project cycle
	11.3 Information sharing and access to data and reports
	11.4 Basin level community support for hydropower
	11.5 Integration of operations in watershed/catchment management

2. The application of the assessment tool

The assessment tool is presented in Appendix A. The tool is designed for a desktop assessment and to focus attention on the sustainability of:

- A single hydropower project and its relationship to a sub-basin;
- Existing and proposed cascades of hydropower projects within a sub-basin or multiple projects within a sub-basin (or 2nd order sub-basin tributary);
- A sub-basin as a whole that has hydropower potential; and
- Transboundary issues for basins shared by different countries, where hydropower is already developed or could be developed in future.

It differs from the H-SAP of the IHA which is designed to assess individual hydropower projects and is not targeted specifically to the sub-basin or basin context.

The assessment tool is also designed to allow consideration of the dynamic nature of hydropower development which often involves several projects in a sub-basin being at different stages of development (proposed, committed, under design, under construction and operating projects) at any point in time.

Hydropower sustainability is complex. It does not depend on the performance of one responsible group (e.g. industry or government) but on the capacity, performance, interaction and collaboration of a range of key players each with different roles. Therefore, multiple aspects of hydropower development, institutional arrangements and basin-wide planning are the subject of the assessment tool. The key players for the purpose of the assessment are:

- Hydropower developers;
- Hydropower operators;
- National government line agencies;
- River basin organisations (basin and sub-basin);
- Project affected communities and their representatives;
- Transboundary and regional institutions; and
- Potential funding agencies, such as multilateral development banks.

The assessment tool focuses attention on the key players' different roles, functions and capacity as well as their level of collaboration with each other to achieve the shared objective of sustainable hydropower.

2.1 Primary aims of the assessment

The primary aims of the assessment tool are:

- To provide a common basis for dialogue and collaboration on sustainable hydropower between key players;
- To highlight and prioritise areas of hydropower sustainability risk and opportunity in a particular basin or sub-basin for further more detailed study; and
- To identify capacity building needs in the basin.

2.2 Different objectives for conducting the assessment

The assessment tool is very flexible and can be used in different ways to meet different needs. The section below outlines different objectives for conducting an assessment.

2.2.1 To inform impact assessment studies

The assessment tool can be used as a checklist to guide a cumulative impact assessment (CIA) or strategic environmental assessment (SEA) of hydropower development in a basin. It could be used by consultants or government line agencies or RBOs responsible for scoping the assessments and/or conducting them.

2.2.2 To assist river basin planning organisations

The assessment tool can be used as a planning tool or checklist for river basin agencies (existing or starting up) to identify what needs to be put in place to make the basin ready or improve it for sustainable hydropower development. It will assist to identify gaps in data, information and policies needed to address sustainable hydropower development issues.

2.2.3 To create dialogue between different stakeholders

The assessment tool can be used as a methodology to bring together different stakeholders to discuss hydropower sustainability and reach agreement on priorities for future studies and main risks and opportunities for hydropower development in a particular basin. The risk assessment process in the tool is designed as a dialogue process to assist collaboration on sustainable hydropower between the key players and hydropower stakeholders.

2.2.4 To monitor hydropower sustainability performance

The assessment tool can be used with the scoring function as a monitoring tool for sustainable hydropower development in a basin over time. It could be applied periodically e.g. every 3 or 5 years to show progress in sustainable hydropower development in a basin.

The scoring and risk assessment could be used to generate a basin state of sustainability report. It could also be used to benchmark different basins against each other and highlight areas of good performance and areas requiring improvement.

2.2.5 To assist capacity building or training

The assessment tool contains valuable reference material and information on sustainable hydropower development. The process of completing an assessment in itself raises awareness and builds capacity on sustainable hydropower development. Hydropower stakeholders, river basin agencies, non government organisations, consultancy firms, government and industry could use the tool for training and capacity building purposes to broaden the hydropower sustainability skills and knowledge base within their organisations.

2.2.6 To assess transboundary arrangements

The assessment tool can be used to identify differences in policy and practice in sustainable hydropower development between different countries and administrative areas in a basin. The assessment will highlight gaps in policy and practice and will identify differences in the regulatory and management framework between different countries or administrative areas. This will assist transboundary institutions and national government agencies to work towards a consistent approach to sustainable development in basins shared between two or more countries.

2.2.7 For prioritising projects or groups of projects and basins

The assessment tool can be used to prioritise or compare the suitability of a hydropower project or groups of projects in a basin based on sustainability considerations. It could also be used to compare the suitability and readiness of different sub-basins for hydropower and highlight the environmental and social risks and opportunities associated with hydropower development in different basins.

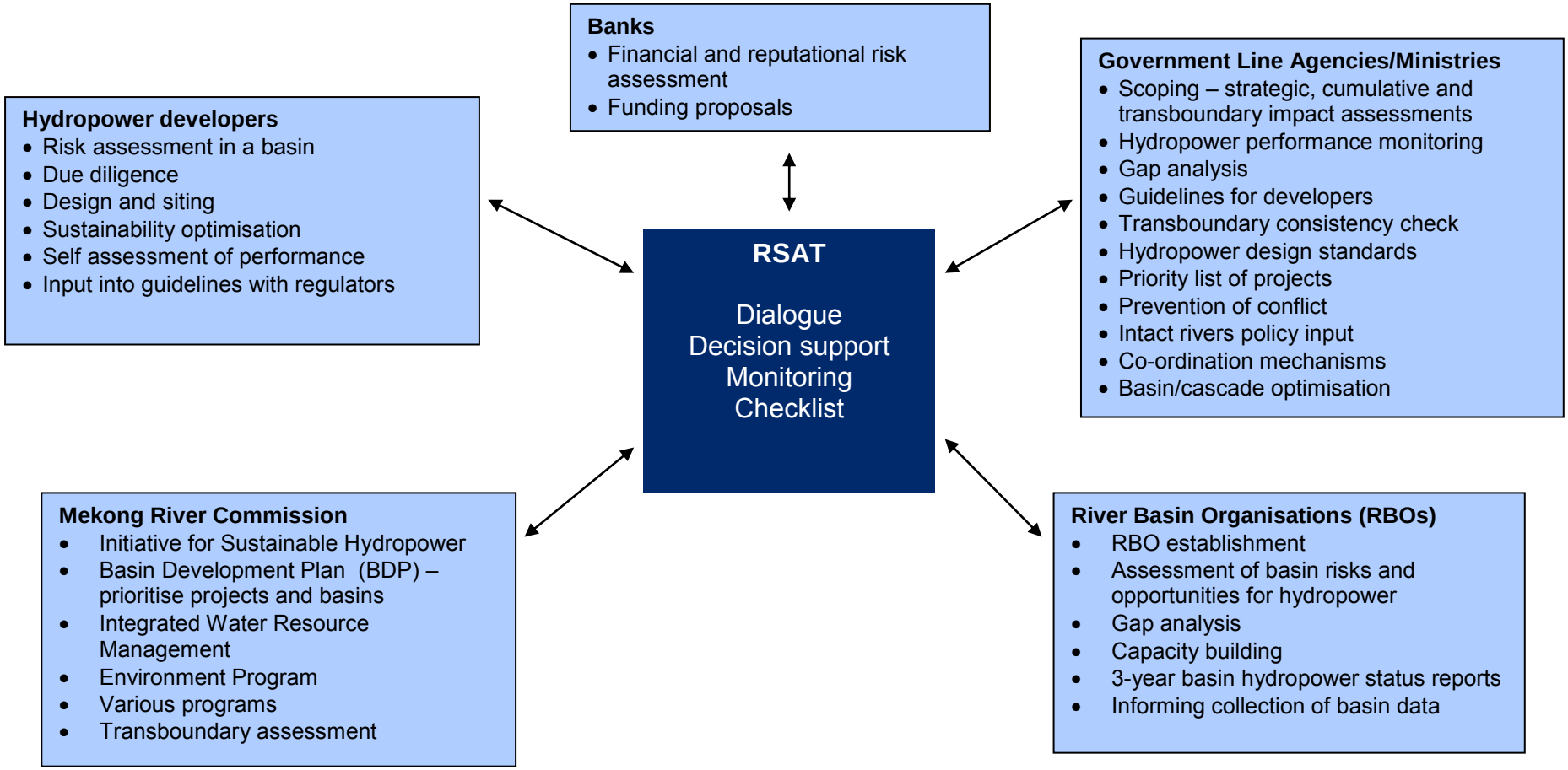
2.2.8 To inform the development of standards for hydropower projects

The assessment tool could be used to identify opportunities to raise the standard of different hydropower developments in a basin. It will highlight the gaps in standards or areas where opportunities for improvements in standards exist. Government agencies or hydropower developers could use this information to inform the development of standards and guidelines for sustainable hydropower development.

2.3 Examples of how different stakeholders can use the tool

Figure 1 shows how different stakeholders can use the assessment tool. The example is based on the Mekong River Basin. In other cases, the names of the organisations, initiatives and studies will vary from basin to basin in different countries.

Figure 1: Flowchart of Applications for RSAT Users



3. How does the assessment tool work?

The main function of the tool is to apply a risk assessment process against a scoring framework. The tool will be used by an assessment team who defines the scope and purpose of the assessment. Once the purpose and scope of the assessment are determined, the assessment team will gather information and data for the assessment and identify key people to interview and potential sources of information for the assessment.

The inputs of the assessment are:

- Data and information collected to form the evidence for the assessment. This will include information on basin-wide data (e.g. hydrology, ecosystem studies, socio-economic studies), hydropower development information and reports (e.g. Environmental Impact Assessments (EIA), feasibility studies), regulatory framework for the basin (e.g. policies and legislation) and the transboundary situation and agreements for the basin;
- Key people that will be interviewed for the assessment;
- The topics, criteria, scoring statements and guidance notes that define basin-wide sustainable hydropower development;
- A risk assessment framework (Strengths, Weaknesses, Risks and Opportunities) that will guide the assessment.

All of these inputs are used to conduct a risk assessment, allocate scores (in some cases) and develop an Assessment Summary Report. The summary report will contain the following:

- A description of the status of the basin for sustainable hydropower;
- A description of the key risks and opportunities for sustainable hydropower in the basin;
- A list of prioritised recommended actions for improving the level of hydropower sustainability in the basin;
- A score which rates the level of hydropower sustainability performance for the basin for each topic (for assessments where scoring is included).

3.1 Who can conduct an assessment?

The assessment can be completed by an assessor or assessment team. It is envisaged that the assessments could be conducted by a multi-stakeholder assessment team in a facilitated workshop situation with available evidence at hand or by a consultant group engaged by a national government agency or multilateral development bank. As hydropower sustainability requires the expertise of a range of disciplines, the assessment will require inputs from a number of people with appropriate expertise and/or local knowledge. An assessor/assessment team and the people they interview should represent the following sources of information during the assessment:

- Local knowledge and development context for the basin/sub-basin;
- Social, environmental and economic expertise relevant to the basin being assessed;
- An understanding of the transboundary situation for shared basins; and
- Engineering and technical expertise in hydropower and dams.

The assessment may or may not include scoring depending on why the assessment is being conducted. If the assessment requires scoring an independent verification of scores is required. The assessment team has to provide information on how the score was reached referring to the scoring statements and the evidence so that it can be independently verified. The person conducting the independent verification should be recognised as qualified to undertake this task.

3.2 Preparation for an assessment

Part 2 of this document includes the Assessment Guide with detailed instructions, checklists and forms for conducting assessments using the RSAT. This section gives a general description of what is required to conduct an assessment.

Preparation of the assessment consists of the following:

- Definition of the scope of the assessment (originator) – what is being assessed and why, scale, time, projects to be included etc.;
- Decision on how the assessment will be conducted;
- Definition of the expected outcomes, reporting requirements and responsibility for follow up actions;
- Selection of assessment team members/assessor;
- Liaison between assessment team to allocate responsibility for preparatory tasks and logistics;
- Gathering of information and data;
- Identification of interviewees;
- Liaison with hosts/relevant organisations to gain permissions, access and support;

- Liaison with interviewees to arrange for prior identification of and access to required information/evidence; and
- Logistical preparation – venue(s), dates, host, data access, allocation of responsibilities, communication, facilitation etc.

Once the above tasks are completed, the assessment can be conducted. The successful implementation of the assessment will depend on the availability of all relevant information and data and people to interview during the assessment period. **The planning, preparation and information gathering stages of the assessment are very important and will take as much time as the assessment stage.** It is envisaged that a dedicated assessment team could complete the assessment, including preparation in a period of one to two weeks depending on the amount of time required to gather all of the relevant data. The information and data gathered for the assessment will form a database of information for sustainable hydropower in the basin that can be used again and built upon for future work. The data and information gathered should be recorded and stored in a way that it can be used again in the future.

3.3 The Assessment Guide

The Assessment Guide can be found in Part 2 of this document and provides detailed information, checklists and forms for conducting an assessment. It is the key document to be used for completing the assessment and is available electronically to the assessment team to use. The contents of the Assessment Guide are outlined below;

The guides and checklists below are used in the preparation stage of the assessment:

- Guidance on how to prepare for and conduct an assessment;
- Preliminary assessment planning and preparation checklist;
- Table showing different uses of the tool and which uses require scoring;
- Checklist of data and information that may be available as evidence for the assessment; and
- Interview schedule form.

The forms below are the forms that have to be filled out during the assessment. The following forms are available electronically for the assessment team to use:

- Assessment information sheet;
- Topic assessment and scoresheet for Topics 1-11;
- Evidence form; and
- Assessment summary report template.

3.4 Topics and criteria

The assessment tool uses a set of topics and criteria to describe basin-wide hydropower sustainability. There are a total of 11 Topics and 53 criteria (see Table 1).

Appendix A to this Main Document provides the detailed Topics and Criteria against which hydropower sustainability will be assessed for a river basin. The contents of Appendix A are listed below:

- Quick guide – how to read scoring statements;
- Eleven topics – title, description and statement of intent for each topic;
- Criteria – a number of criteria for each topic;
- Scoring statements (1-5) for each criterion;
- Examples of evidence for each criterion;
- Guidance notes for each topic; and
- Definitions.

A brief description of the main elements is given below.

3.4.1 Topics

The assessment consists of 11 key topics for hydropower sustainability (see Table 1). These 11 topics were developed to capture the key issues for basin-wide hydropower sustainability. It is not intended to be an exhaustive coverage of all hydropower sustainability issues. For each topic a description of the topic and a statement of intent are given.

3.4.2 Criteria

There are a number of criteria within each topic (see Table 1). The criteria have been selected to represent the key considerations to enable assessment of each topic. Each criterion consists of a descriptive heading and five scoring statements (1 to 5). There are 53 criteria in total.

3.4.3 Scoring statements (1-5)

Each criterion consists of 5 scoring statements. The assessment team, using evidence and interviews, has to select which scoring statement most accurately reflects the situation for that criterion. The "3" scoring statement outlines basic acceptable practice, reaching minimum standards, based on global good practice. The Assessment Guide provides a table showing the types of characteristics that may be evident for each score of 1 to 5.

3.4.4 Guidance notes for each topic

Guidance notes are presented at the end of each topic in the assessment guide. The guidance notes include the list of examples of evidence and provide instructions and additional information relevant to individual criteria to assist the assessor in completing the assessment. Where guidance notes relate to a particular criterion, this is indicated in the criterion heading as shown below.

Criterion 1.1 Alignment with regional and international policies/plans and national commitments for basin development: (see Guidance Notes)

3.4.5 Examples of evidence

For each topic a list of examples of evidence is included in the Guidance Notes for that topic.

3.4.6 Definitions

A list of definitions is included at the end of Appendix A.

APPENDIX A

TOPICS & CRITERIA

Quick Guide:

1. How to read the scoring statements.

Each criterion consists of 5 scoring statements. The assessment team, using evidence and interviews, has to select which scoring statement most accurately reflects the situation for that criterion. The "3" scoring statement outlines basic acceptable practice, indicating the achievement of minimum standards, based on global good practice.

The 3 statement should be read first. If the situation does not meet the requirements of the 3 statement, the assessment team should then refer to the 1 and 2 statements. If the situation exceeds the requirements of the 3 statement, the assessment team should then refer to the 4 and 5 statements. The 4 and 5 statements start with "In addition," because the score of 4 has to also meet the requirements of 3 and 4. The score of 5 has to meet the requirements of the 3, 4 and 5 statements.

2. How to assess different levels of sustainability performance between past/existing and new projects in a basin.

If a basin or sub-basin is being assessed and includes past or existing project(s) which have a poor sustainability performance for a particular criterion but other recent or future projects in the basin have higher performance for that sustainability criterion, then the following 3 statement should be used to determine whether a score of 3 or above can be applied to the basin for that criterion.

A basin or sub-basin with past or existing project(s) that have poor sustainability performance can achieve a score of 3 if it can be demonstrated that the continuous improvement 3 scoring statement (below) is satisfied for that basin. In addition, the basin must meet the 3 statement specific to that criterion for current and future projects.

Continuous Improvement 3 Statement:

i) Lessons from unsustainable practices in the past have been learned and are being incorporated into decision making and regulatory frameworks for new projects by government and industry. *(Evidence: a) new policies, legislation, regulations and monitoring or management plans to improve performance for existing and future projects).*

ii) The current operation and maintenance of poorly performing existing projects is taking significant steps to improve the sustainability performance of that project. *(Evidence: a) implementation of improved practices by developers and operators, b) changes to agreements and management plans to improve performance.*

iii) The extent of impact from the poorly performing project is not significant in a whole of basin context for that criterion or is significantly improving over time *(Evidence: a) monitoring data and independent reports measuring performance over time show no significant impact or significant improvement over time that will continue).*

TOPIC 1: Hydropower and economic development in the basin/sub-basin

This topic addresses the contribution of hydropower to the socio-economic development of the local economies in the basin and the national economy.

The intent is that hydropower will make a significant positive contribution to the socio-economic status and well-being of the basin populations at the local and basin levels and will make a positive contribution to national economies.

Criterion 1.1 Relative contribution of hydropower to national economies

5 – In addition, economic assessment of hydropower development options factor in full costs of mitigation measures for social and environmental impacts over the life of the project and funding agreements are in place for national mitigation and compensation measures.

4 – In addition, the opportunity cost of hydropower in the basin is quantified at the national level and hydropower development options that minimise adverse impacts and achieve an overall positive economic contribution to the national economy are selected by national governments. Hydropower development options that are selected to achieve national economic growth include agreements for local economic growth where the project impacts are located.

3 – National economic development plans and energy and water options studies estimate the relative contribution of hydropower to national economies. The environmental, socio-cultural and socio-economic impacts and costs of hydropower in the basin are quantified where possible and assessed against the economic contribution of hydropower to national economies to determine the overall contribution.

2 – Assessment of economic contribution of hydropower development but significant gaps and/or not all impacts are costed.

1 – No consideration of the overall economic contribution of hydropower development on the local or national economy and/or hydropower has overall negative contribution.

Criterion 1.2 Relative contribution of hydropower to local economies

5 – In addition, economic assessment of hydropower development options factor in full costs of mitigation measures for social and environmental impacts at the local level over the life of the project and funding agreements are in place for local mitigation and compensation measures.

4 – In addition, the opportunity cost of hydropower in the basin is quantified to the local/village level and hydropower development options that minimise adverse impacts and achieve an overall positive economic contribution to local economies are selected by national governments. Hydropower development options that are selected to achieve national economic growth include agreements for local economic growth where the project impacts are located.

3 – Sub-national and provincial economic development plans and energy and water options studies estimate the relative costs and benefits of hydropower to local economies, down to the village level. The local environmental, socio-cultural and socio-economic impacts and costs of hydropower in the basin are quantified where possible and assessed against the

economic contribution of hydropower to local economies to determine the overall contribution.

2 – Assessment of economic contribution of hydropower development but significant gaps and/or not all impacts are costed.

1 – No consideration of the overall economic contribution of hydropower development on the local or national economy and/or hydropower has overall negative contribution.

Criterion 1.3 Synergies and trade-offs with other economic sectors in the basin (upstream and downstream)

5 – In addition, it can be demonstrated that development options chosen represent the best balance of economic growth between sectors. Formal legally binding agreements are in place to protect the economic viability of other sectors in the basin and include compensation provisions for sectors negatively impacted by hydropower development.

4 – In addition, other sectors affected by hydropower development are represented in a meaningful consultation process in hydropower decision making by national governments.

3 – Development plans or commitments for other sectors and sub-sectors in the basin are in place. The synergies and trade-offs between hydropower development and other economic sectors in the basin (e.g. agriculture, tourism, fisheries) are assessed by national governments to determine the synergies, trade-offs, costs and benefits between the other sectors and hydropower development.

2 – Links between hydropower and the growth of other sectors have been made, but no plans in place or quantification of sectoral relative contributions or impacts.

1 – Hydropower development likely to significantly disadvantage other sectors and/or no consideration of other sectors.

Criterion 1.4 Multiple water use optimisation

5 – In addition, negotiated agreements are in place to provide long term security to other water uses (e.g. irrigation and water supply).

4 – In addition, multiple use optimisation studies are conducted in a process of meaningful consultation with other water users and formal multiple-use agreements are in place in the basin.

3 – Policies and commitments are in place in the basin that set standards and objectives for multiple-use of water resource development projects. Hydropower feasibility and options studies address multiple-use considerations as a priority criterion and national governments have a policy to select projects with multiple-use benefits.

2 – Evidence of consideration of multiple uses but no optimisation.

1 – No consideration of multiple uses in hydropower or basin planning or hydropower development.

Topic 1 Guidance Notes

Topic 1 Examples of Evidence:
1. Regional economic integration plans, 2. Sub regional energy, development plan, 3. Hydropower development plan, 4. ASEAN Charter, 5. Project feasibility studies, 6. Multiple use/optimisation studies, 7. Options Assessment Studies, 8.Consultation documentation with other sectors.

TOPIC 2: Hydropower and social and cultural well-being in the basin/sub-basin

This topic addresses socio-cultural values and non-material uses of natural resources as well as the protection of livelihoods and natural resource access rights and entitlements of the basin population.

The intent is that no people in the basin are worse off as a result of hydropower and that cultural values and non material uses of natural resources are protected.

Criterion 2.1 Cultural values and non-material uses of resources (See Guidance Notes)

5 – In addition, legally binding negotiated agreements are/will be in place for hydropower development to protect these values and uses and are the result of a meaningful consultation process. Negotiated compensation agreements in place where impact to values is unavoidable.

4 – In addition, a regulatory framework for the protection of cultural values and non-material use of resources is in place and hydropower is consistent with it. It can be demonstrated that existing and future hydropower development has broad community support from the traditional resource users and ethnic groups impacted directly or indirectly by the development.

3 – Baseline basin-wide assessment of cultural and heritage values (using anthropologists, archaeologists and other appropriate expertise in culturally appropriate meaningful consultation with traditional resource users) is in place. Policy/regulation/management plans are in place to protect cultural values and traditional resource uses of the different indigenous peoples and ethnic groups in the basin. Hydropower development is/will be consistent with these/or hydropower developers and operators assess impacts according to minimum acceptable international standards.

2 – Assessment of cultural and heritage values across the basin and assessment of hydropower impact on traditional/non-material resource uses but not comprehensive or basin-wide and/or limited policy framework in place and/impacts to values is evidence.

1 – No assessment or understanding of cultural or heritage values, or traditional non-material uses of existing resources/or hydropower development is or is likely to have significant impact.

Criterion 2.2 Protection of livelihoods and land and water access rights and entitlements (see Guidance Notes)

5 – In addition, all recognised project affected groups at the village level, have/will negotiate mutually agreed, formal and legally enforceable mitigation, compensation and development

agreements for livelihood protection and access to land and water resources that are funded over the life of the project and include grievance mechanisms.

4 – In addition, hydropower development includes a process of meaningful consultation and good faith negotiations to protect and enhance livelihood opportunities for project affected communities at all stages of development. National legislation and agreements are in place to protect land and water access rights and entitlements of the basin population and hydropower development is consistent with these or minimum acceptable international standards.

3 – A basin-wide understanding of the links between natural resource use, livelihoods and socio-cultural well being is in place. Assessment of livelihood needs and land and water access rights and entitlements is conducted at the village level as the highest priority and the basin level. Plans to protect and improve livelihood opportunities of the basin population are in place. Hydropower development is/will be consistent with these/or is consistent with minimum acceptable international standards for livelihood protection.

2 – Assessment of livelihood issues and land and water access rights and entitlements in the basin and the impact of hydropower but not comprehensive or at a local scale. Loss of livelihoods has/will likely occur as a result of hydropower development.

1– The hydropower development will/has resulted in significant livelihood loss of individuals or groups in the basin and loss of access to land and water resources and/or no assessment of livelihood issues.

Criterion 2.3 Involuntary re-settlement (see Guidance Notes)

5 – In addition, all re-settled groups negotiate mutually agreed, formal and legally enforceable mitigation, compensation and development agreements that include grievance mechanisms and are funded over the life of the project and consistent across the basin.

4 – In addition, involuntary re-settlement agreements exist for hydropower projects and include all of the requirements as outlined in the Guidance notes. Financial models for projects include long-term cost of resettlement and livelihood restoration as a project cost over the life of the project.

3 – Policies and regulations (transboundary) are in place in the basin that address involuntary re-settlement requirements, prioritising the avoidance of re-settlement. Hydropower development has/will prioritise the avoidance and minimisation of population displacement in its options, siting and design studies. Re-settlement and livelihood restoration programs are/will be implemented and monitored appropriate to the stage of development.

2 – Assessment of hydropower options and design includes the minimisation or avoidance of population displacement as a criterion but is not given high priority or properly costed in economic studies.

1 – No attempt to avoid or minimise resettlement in hydropower planning/or project likely to result in significant avoidable physical displacement of people.

Criterion 2.4 Hydropower and poverty reduction

5 – In addition, the sustained reduction of poverty as a result of hydropower can/will be demonstrated, in particular for vulnerable, disadvantaged and marginalised groups and project affected communities. Hydropower development does not/will not result in economic disadvantage to any vulnerable or disadvantaged groups in the basin.

4 – In addition, hydropower is embedded into poverty reduction plans and hydropower negotiated agreements include requirements to directly address poverty issues associated with hydropower project development.

3 – A baseline inventory of poverty condition across the basin is in place and the hydropower options and feasibility studies and/or master plan clearly demonstrate how the project will contribute to poverty reduction in the basin with a clear priority for directly assisting vulnerable or marginalised groups. A national and regional poverty reduction plan or agreement is in place and is supported by policy, institutions and regulations across jurisdictions.

2 – Studies in poverty reduction exist in different parts of the basin, but there is no basin-wide co-ordinated approach. It is unclear how hydropower will contribute to poverty reduction.

1 – No poverty reduction plans in place in the basin or/hydropower unlikely to contribute to alleviation of poverty and may have significant adverse impacts.

Criterion 2.5 Hydropower and equitable social advancement

5 – In addition, it can be clearly demonstrated that hydropower has/will contribute to the progressive improvement of social indicators in the basin over time across different social and ethnic groups and indigenous groups. Poverty reduction targets are in place and hydropower contribution to targets is monitored.

4 – In addition, regulations exist to secure social advancement initiatives as part of basin development across jurisdictions. Hydropower planning is integrated with basin planning and social planning.

3 – Baseline assessment of social indicators and trends across the basin are included in basin planning. Hydropower feasibility and social studies measure the existing and future contribution of hydropower to social advancement and equity (e.g. education, gender equality, health, employment, life expectancy, status of vulnerable groups, infant mortality etc).

2 – Social advancement can be demonstrated as a result of hydropower but limited studies and/or inequity across different jurisdictions. Some social disadvantage as a result of hydropower development is evident.

1 – No social advancement/or a significant decline in social indicators can be demonstrated as a result of hydropower projects/or no assessment of social indicators across the basin.

Topic 2 Guidance Notes

Topic 2 Examples of Evidence:
1. Archaeological and anthropological assessments in the basin, 2. Consultation reports with traditional/indigenous users, 3. Project EIA and management plans, 4. Policies and agreements for protection of cultural resources, 5. Resettlement and compensation plans, 6. Livelihood and poverty assessment surveys, 7. Records of interviews with project affected people, 8. Consent documents – project affected communities, 9. Negotiated agreements between project and project affected communities, 10. Project socio-economic studies, 11. Project feasibility studies/options assessment/siting and design studies, 12. Evidence of good faith negotiations, 13. Regional and national data and reports on social well-being indicators,

14. Hydropower plans, 15. Regional development plans.	
Criteria	**Guidance Notes**
Criterion 2.1	Non-material, spiritual and sacred uses of resources include: • Traditional/indigenous; • Ceremonial; • Sacred and non sacred rituals; • Religious; and • Spiritual connections to place. These uses may be by indigenous or other ethnic groups in the basin.
All	**Meaningful Consultation** – is a process that (i) begins early in the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making such as project design, mitigation measures, the sharing of development opportunities and benefits, and implementation issues. Particular attention will be paid to the needs of disadvantaged or vulnerable groups, especially those below the poverty line, the landless, the elderly, female headed households, women and children, Indigenous Peoples and those without legal title to land. (ADB 2009)
All	**Broad Community Support** – a collective expression by the affected communities through individuals and/or their representatives of broad community support for the project activities. Such broad community support may exist even if some individuals or groups object to the project activities. (ADB 2009)
Criterion 2.3	**Outline of an involuntary re-settlement plan** As a minimum, a re-settlement plan or agreement should include: • Project description; • Scope of land acquisition and re-settlement; • Alternatives considered; • Socio-economic information and profile of affected communities; • Information disclosure, consultation and participation; • Grievance re-dress mechanisms; • Legal framework; • Entitlements, assistance and benefits; • Relocation of housing and settlements; • Income restoration and rehabilitation; • Re-settlement budget and financing plan; • Institutional arrangements; • Implementation schedule; and • Monitoring and reporting of outcomes. (Source: ADB 2009)

All criteria	**Free and Prior Informed Consultation** – involves organised and iterative consultation (meaningful consultation), leading to the client's incorporating into their decision making process the views of the affected communities on matters that affect them directly, such a proposed mitigation measures, the sharing of development benefits and opportunities and implementation issues. The decision making process should be documented, in particular the measures taken to avoid or minimise risks and adverse impacts on the affected communities. (IFC 2006)
	Good Faith Negotiations – Good faith negotiations are those that have involved a full and frank disclosure of all available information and that were entered into with an honest view to reaching an agreement. (Australian Institute of Aboriginal and Torres Strait Islander Studies). If Good faith negotiations fail to reach an outcome an independent conflict resolution process should be initiated.

TOPIC 3: Hydropower and environmental quality and natural resources management in the basin/sub-basin

This topic addresses the protection of environmental quality and ecosystem integrity across the basin and the basin-wide management of natural resources.

The intent is that a basin-wide understanding of the ecosystem functions, values and services informs decisions on hydropower and that hydropower will be developed in a way that results in no net loss of ecosystem integrity at the basin scale and contributes to the optimal use of natural resources.

Criterion 3.1 Understanding and protection of basin-wide ecosystem integrity

5 – In addition, an ongoing ecosystem health monitoring, research and review program is in place in the basin. Hydropower development does not/will not result in net loss of ecosystem integrity of the basin. Hydropower operators pro-actively contribute to the efforts in the basin for ecosystem protection through ongoing research and improvement of management measures over time.

4 – In addition, formal conservation management plans and agreements are in place for the basin (transboundary) and include legal protection of high value biodiversity and critical habitat sites. Hydropower development includes agreements and management plans for the protection of ecosystem integrity at all stages of development.

3 – A basin-wide understanding of ecosystem connectivity, biodiversity values, critical habitats and ecosystem processes is in place as a result of comprehensive scientific assessment. Policy and regulations are in place to protect ecosystem integrity at the basin level. Hydropower environmental and cumulative impact assessments address the impact of hydropower on basin-wide ecosystem integrity and meets national or international minimum acceptable standards.

2 – Assessment of ecosystem integrity evident but gaps or not at basin level. Policy and regulations exist but are not comprehensive or consistent across the basin. Project impacts only assessed at local scale.

1 – No basin-wide understanding of ecosystem integrity and/or no regulations in place for protection at national or regional level. Hydropower development is likely to have a significant impact on ecosystem integrity and/or impacts not assessed.

Criterion 3.2 Management of hydropower environmental impacts

5 – In addition, programs to mitigate impacts from hydropower development adapt and improve over time as knowledge increases. Management plans and agreements include flexibility to adapt to future climate change (and other) scenarios.

4 – In addition, hydropower development agreements at all stages of the project life cycle include requirements for the protection and monitoring of ecosystem integrity as an integral part of development and operation over the life of the projects.

3 – A national (transboundary) regulatory framework is in place for environmental protection and includes provision for the approval and implementation of management plans and the monitoring of compliance against management plans. Hydropower development is consistent with these requirements/or meets minimum acceptable international standards for environmental protection.

2 – Management plans exist but significant gaps and/or hydropower development is not consistent with all of the plans and policies for the basin/or regulatory framework not effectively implemented.

1 – No regulatory framework in place for managing impacts to ecosystems/or hydropower development is not consistent with policies and plans.

Criterion 3.3 Protection of high value rivers from development

5 – In addition, hydropower projects are developed in full conformance with these policies and agreements and a process of ongoing monitoring, research and review is in place to increase protection of undeveloped high value rivers in the basin.

4 – In addition, national and transboundary water policies and agreements are in place to ensure that the identified high value rivers will be maintained in their natural state to protect the ecosystem integrity and biodiversity values of the basin.

3 – High value rivers in the basin that are in their natural state and representative of critical habitats and ecological processes have been identified as a result of independently verified scientific studies. Policies and commitments are in place to protect these rivers from development and are implemented. Hydropower development is consistent with these and/or hydropower siting studies prioritise the avoidance of high value rivers in the natural state.

2 – Identification of high value river in basin planning or at national level but not comprehensive and/or no legal framework for protection from development.

1 – No identification or protection of high value rivers at national or international level/or hydropower projects planned on undeveloped high value and representative rivers.

Criterion 3.4 Hydropower impact on sustainable use of natural resources

5 – In addition, hydropower is highly integrated with other natural resource uses and a joint approach to sustainable natural resource use across the basin is evident.

4 – In addition, agreements are in place that set targets and objectives for the hydropower contribution to sustainable natural resource use in the basin. Hydropower is consistent with these.

3 – A basin-wide inventory of natural resources is in place across the basin. Basin-wide policies and plans that set objectives and targets for their sustainable use are in place Hydropower feasibility and options studies address the impact of hydropower development on the sustainable use of natural resources in the basin (e.g. water, soil, forests). Hydropower development is consistent with sustainable natural resource policies and plans.

2 – Assessment of the impact on natural resources in the basin evident but not quantified or comprehensive or basin-wide.

1 – No consideration of natural resource use in hydropower project planning or hydropower likely to significantly impact on sustainable natural resource use in the basin.

Criterion 3.5 Impact on river morphology, erosion and sedimentation (see Guidance Notes)

5 – In addition, hydropower management approaches for erosion and sedimentation are integrated with the management approaches of other sectors in the basin (e.g. mining, agriculture). An ongoing process of monitoring and review is in place and improvement in practices over time by hydropower operators can be demonstrated.

4 – In addition, regulations and management agreements are in place and effectively implemented by line agencies for sediment management in the basin (transboundary). Hydropower projects in a cascade or sub-basin do/will co-ordinate their management approaches to erosion and sediment management to achieve basin-wide objectives.

3 – Baseline erosion and sedimentation condition inventory is in place for the basin. It includes sediment budgeting which distinguishes between the different qualities of sediment (e.g. grain size and quality). The impact on river morphology, erosion and sedimentation is assessed in hydropower project environmental impact assessment studies including cumulative assessment for multiple projects and meets national or minimum acceptable international standards.

2 – Assessment of erosion and sedimentation condition but not basin-wide or comprehensive. Assessment of hydropower impacts on river morphology not rigorous or applied basin-wide.

1 – No basin-wide assessment of erosion and sedimentation condition or understanding of hydropower impacts on river morphology/or hydropower likely to significantly impact on river morphology and sediment flows.

Criterion 3.6 Monitoring changes to environmental quality as a result of hydropower

5 – In addition, environmental health data are available to all hydropower stakeholders and hydropower operators provide independently verified monitoring reports to basin authorities and national regulators regularly. Data are used by national governments to inform future decisions and policy on hydropower development in the basin.

4 – The individual and cumulative impacts of existing and proposed hydropower operations on environmental quality in the basin are understood as a result of a co-ordinated and scientifically rigorous ecosystem health monitoring program applied consistently across the basin and in different jurisdictions. The program includes long term baseline data collected prior to development.

3 – Monitoring programs are in place in the basin to determine impacts of hydropower on environmental quality and ecosystem integrity. The monitoring program is scientifically rigorous, and includes participation of all jurisdictions in the sub-basin. The program includes collection of baseline data across the basin prior to development with minor gaps.

2 – Monitoring of hydropower impacts but not scientifically rigorous or consistent in different jurisdictions, resulting in limited understanding.

1 – No monitoring or understanding of impact of hydropower on environmental quality in the basin.

Topic 3 Guidance Notes

Topic 3 Examples of Evidence: 1. Strategic environmental assessments at the basin or sector level, 2. Hydropower/basin development options studies, 3. Initial environmental examinations and/or EIA for specific projects at the feasibility study stage, 4. Environmental management plans, 5. Basin-wide ecosystem studies and inventories, 6. Biodiversity management plans, 7. Habitat assessment studies, 8 Policies, regulations and agreements to protect biodiversity in the basin, 9. National high value rivers policies, 10 Inventory of high value rivers and their biodiversity value, 11. Basin development plan/ IWRM plan, 12. Basin natural resource plan, 13. Project feasibility or pre-feasibility reports, 14. Policies, regulations or plans governing natural resource use, 15. River morphology surveys, 16. Navigation plans, 17. River bank and bed erosion surveys, 18. Seawater intrusion data in delta regions, 19. Nutrient flow assessments, 20. Sediment flow studies, 21. Floodplain and fisheries – dynamics and productivity studies, 22. Basin environmental monitoring reports and databases 23. Project environmental monitoring reports.	
Criteria	**Guidance Notes**
Criterion 3.1	**Ecosystem integrity** is defined as: The long term ability of an ecosystem to self-support and maintain an adaptive community of organisms having a species composition, diversity, and functional organization favourably comparable to that of nearby natural habitats. It depends on adequate representation and protection in the basin of: • Critical habitats needed to sustain species - e.g. rapids, gravel and cobble deposition sites, deep ponds, sandbars, waterfalls, wetlands, native

	vegetation; • Critical ecosystem processes – e.g. nutrient transport and deposition, flow quantity, quality timing and duration, food web interactions, species migration etc.; • High value sites or "biodiversity hot spots" which are defined as sites that if damaged or removed would have significant detrimental effects on a species, community or ecosystem; and • Habitat range, migration routes and requirements for migratory species, e.g. migratory birds and fish. To protect ecosystem integrity, the identified critical habitats, processes and high value sites need to have adequate representation and protection in their natural state in the basin.

TOPIC 4: Options assessment and alignment with national, regional and international agreements, policies and plans

This topic addresses the assessment of options and alternatives to meet energy and water needs in the basin and the extent to which the hydropower development fits with relevant international, national or regional agreements, policies and plans for sustainable development. For basins where electricity will be exported from the basin, it addresses the options and alternatives to earning export revenue.

The intent is that decisions about hydropower development should be taken as a result of a comprehensive multi-criteria options assessment which considers alternative development scenarios (to hydropower) for meeting water and energy needs and alternatives to earning revenue from electricity export. The intent is also that hydropower will make a positive contribution to the sustainable development of the basin.

Criterion 4.1 Options assessment for water and energy services in the basin or export revenue (see Guidance notes)

5 – In addition, it can be demonstrated that the selected option is the preferred option based on a comprehensive and documented multi-criteria options assessment where social and environmental criteria have been given the same significance as technical and economic criteria.

4 – In addition, the analysis of options has included participation of transboundary, national and regional stakeholders in a meaningful consultation process and the criteria used strongly emphasises sustainability and regional/basin-wide considerations.

3 – A comprehensive multi-criteria assessment (against criteria listed in Topic 4 Guidance Notes) has been undertaken at the basin or national government level of the options and alternatives available to meet demonstrated energy and water needs in the basin and/or options and alternatives to earning revenue from the export of electricity from the basin.

2 – Options assessment conducted but does not include full range of sustainability criteria.

1 – No multi-criteria options assessment has been conducted for hydropower development in the basin

Criterion 4.2 Alignment with regional and international agreements, policies/plans and national commitments for basin development: (see Guidance Notes)

5 – In addition, the hydropower development is/will be fully consistent with regional, international and national sustainable basin development agreements within and across jurisdictions. The hydropower development is/will be a major contributor to sustainable basin development.

4 – In addition, policies, plans and agreements are integrated across sectors and jurisdictions and hydropower is aligned with these and integrated with the basin management objectives of other sectors. Hydropower agreements for sustainable basin development are in place with national governments.

3 – Regional, international and national policies, plans and agreements (e.g. the 1995 Mekong Agreement) are in place for sustainable basin development with minor gaps. Hydropower development is consistent with these or hydropower impact assessment studies address sustainable basin development issues.

2 – Basin-wide policies, plans and agreements are in place, but inadequately integrated and/or significant gaps. Hydropower development is not consistent with these.

1 – No/limited plans in place and/or hydropower unlikely to contribute to sustainable basin development.

Criterion 4.3 Alignment with integrated water resource management (IWRM) planning in the basin

5 – In addition, negotiated agreements are in place for hydropower to achieve basin management objectives. The IWRM plan provides a framework of adaptation to future climate change (and other) scenarios and includes hydropower needs for adaptation.

4 – In addition, hydropower development is embedded into the IWRM plan and the basin-wide implications of different hydropower scenarios are addressed. There is a high level of integration between basin planning and hydropower planning and regulation (e.g. consistent policies, sharing of data and information and clear lines of communication).

3 – A basin/sub-basin management plan is in place with links to an IWRM framework and includes participation of all jurisdictions in the basin. Objectives and targets for sustainable basin development are in place and hydropower development is consistent with the objectives of the plans or is consistent with minimum international standards for basin management.

2 – IWRM planning in place but not comprehensive or integrated and limited consideration of hydropower and/or lack of linkage between IWRM and hydropower.

1 – No IWRM planning in place and/or hydropower inconsistent with IWRM objectives.

Topic 4 Guidance Notes

Topic 4 examples of evidence: 1. Options assessment studies, 2. Integrated River Basin Management (IRBM) or IWRM plans, 3.Hydropower project pre-feasibility or feasibility studies, 4. Basin development plans, 5. Plans and reports showing hydropower compliance or integration with basin plans, 6. National signatures on global and regional environmental agreements, 7. Notifications from Lower Mekong countries regarding specific projects.	
Criteria	**Guidance Notes**
Criterion 4.1	**Comprehensive Options Assessment** Options assessment occurs at the very early stage of the project cycle. It occurs before feasibility or siting studies which are different processes. The options study is a high level process looking at options and alternatives (to hydropower) to meet the energy and water service requirements in the basin or to earn export revenue in basins where electricity is exported from the basin. The criteria to be used in an options assessment are listed below: **For basins where electricity will be used in the basin** • All policy, programme and project alternatives; • Giving social and environmental aspects the same significance as technical, economic and financial factors; • Giving demand-side options the same significance as supply–side options; • Improving performance of existing systems and resource conservation measures in the demand forecast as a priority; • River-basin-wide aspects and cumulative impacts; • Potential changes in climate; and • The precautionary approach. (Source: WCD 2000) **For basins where electricity will be exported outside the basin** For basins where the electricity will be exported to places outside the basin, the option assessment would include consideration of alternatives to earning export revenue and the trade-offs between the social and environmental impacts of hydropower development in the basin and the potential revenue earned. It may consider how that export revenue will benefit economic growth, social well-being and environmental protection in the basin where impacts are located.
Criterion 4.2	International policies/plans and national commitments for basin development include: • Basin plans, sub-basin plans, provincial or municipal plans, sector or sub-sector plans; • National policy frameworks and development targets (for relevant sectors);

	• The 1995 Mekong Agreement/procedures/guidelines; • Other relevant regional/international conventions or agreements (e.g. Millennium Development Goals, RAMSAR/CITES, United Nations Framework Convention on Climate Change (UNFCCC), Greater Mekong Subregion (GMS), 1997 United Nations Convention Agreements related to hydropower considerations); and • National legislation and regulations.

TOPIC 5: The co-ordination and optimisation of site selection and design, implementation and operations for multiple projects in a basin or cascade

This topic addresses the siting, design and optimisation of multiple hydropower projects in a basin context. It also addresses how planning for the implementation and operational stages of multiple project hydropower development is co-ordinated to achieve sustainability objectives.

The intent is that if siting and design studies and planning for the implementation and operations stages of multiple project hydropower development is co-ordinated across the basin, then consistency in management approaches can be achieved and optimised to meet sustainability objectives.

Criterion 5.1 Multi-criteria assessment for site selection, design and optimisation for multiple projects in a basin or cascade (see Guidance Notes)

5 – In addition, all or nearly all of sustainability criteria listed are addressed

4 – In addition, five or more but not all of the listed sustainability criteria assessed (see Guidance Notes)

3 – Modelling of different hydropower development siting and design options for multiple projects (including existing and future projects) takes place at the basin level and considers multiple sustainability criteria including:

- Transboundary considerations and potential for conflict between jurisdictions;

And, three or more of the listed sustainability criteria, including: **(see Guidance Notes for additional list)**

- The opportunity cost of hydropower in different sub-basins;
- Optimising existing infrastructure and demand-side management options;
- Multiple projects on one river versus single projects on multiple rivers;
- Protection of significant ecological and cultural sites and the ecological processes that support them;
- Protection of some rivers in the basin from regulation;
- Whether projects that are not viable as stand alone may be beneficial in a basin/cascade context;
- Design requirements to achieve sustainability objectives and the need for consistent structural features on dams in a basin or cascade (e.g. sediment sluice gates and bottom outlets); and
- Flood and drought management risks and opportunities.

2 – Scenario modelling/options assessment including one or less of the listed criteria considered.

1 – No modelling of hydropower scenarios/options assessment conducted at basin level.

Criterion 5.2 Protection of unique biodiversity/habitat and culturally significant sites in hydropower site selection and design

5 – In addition, all known sites in the basin have been identified and have long term legal protection as a result of a rigorous assessment process. Hydropower development pro-actively avoids impacts to these sites.

4 – In addition, an ongoing process to identify and protect unique and irreplaceable sites in the basin is in place and sites are protected in legally binding agreements. Hydropower development avoids sites and is consistent with national regulatory framework or minimum international standards.

3 – Basin-wide inventory of sites of unique and irreplaceable biodiversity and cultural significance is in place and commitments or regulations exist to protect them. Hydropower development in the basin has/will avoid identified unique and irreplaceable sites and ensure their long term protection and is consistent with regulatory framework.

2 – Limited understanding of unique and irreplaceable sites in the basin and/or sites not prioritised in options assessment or protected during hydropower development.

1 – Limited or no consideration of unique and irreplaceable sites and or no protection of sites.

Criterion 5.3 Co-ordination of planning for hydropower implementation in a basin with multiple projects

5 – In addition, agreements exist within and between jurisdictions to control the order and pace of development in the basin to minimise adverse impacts.

4 – In addition, hydropower implementation planning includes meaningful consultation with hydropower stakeholders and agreements to address impacts to other sectors during hydropower implementation stage (e.g. transport).

3 – Hydropower implementation planning for multiple projects incorporates basin-wide consideration of the criteria listed below;

- The potential for conflict;
- Opportunities for sharing costs and easements for associated infrastructure (e.g. roads and power lines) between projects;
- Social and environmental impacts and during implementation stage;
- Disruption to communities and pressure on basin resources (e.g. roads) and other sectors during implementation stage; and
- How the order and pace of development can be planned to reduce impacts and enhance benefits.

2 – Limited co-ordination of hydropower implementation planning in the basin.

1 – Projects developed in *ad hoc* manner with no consideration of optimising the implementation of hydropower projects.

Criterion 5.4 Co-ordination of planning for hydropower operations in a basin with multiple reservoirs or cascades

5 – In addition, an ongoing process of monitoring and review is in place and implemented and future development is informed by learning from existing development. Improvement in co-ordination over time is evident.

4 – In addition, co-ordinated flow management does/will include communication with downstream communities and is developed based on a process of meaningful consultation. Agreements for co-ordinated flow management of multiple projects are in place and include the flexibility to adapt to future climate change (and other) scenarios.

3 – Basin-wide policies or commitments are in place for co-ordinated planning of hydropower operations and flow regulation. They include provisions for co-operation and information sharing between hydropower operators and developers for existing and new projects to achieve basin-wide objectives for flow regulation and management of sustainability issues (e.g. fish passage, sediment flow). Hydropower development is consistent with these and/or hydropower feasibility studies address co-ordination with other hydropower operators in the basin to achieve objectives.

2 – Co-ordination in operational and/or structural provisions evident but limited in effectiveness.

1 – No co-ordination between reservoir owners/developers.

Topic 5 Guidance Notes

Topic 5 Examples of Evidence: 1. Project feasibility studies, 2. Basin scenario assessment studies, 3. Options assessment studies, 4. Strategic Environmental Assessment studies, 5. Optimisation studies 6. Regulations and policies for hydropower options assessment, 7. Regulations and policies for hydropower options assessment, 8. Basin ecosystem studies, 9. Policies and regulations for environmental protection 10. Hydropower environmental management plans, 11. Power system planning studies, 12. Environmental flow studies for cascade or multiple projects, 13. Cumulative EIA studies.	
Criteria	**Guidance Notes**
Criterion 5.1	Additional list of sustainability criteria: • Prioritise upgrading existing facilities; • Prioritise alternatives that have multiple-use benefits; • Prioritise alternatives on already developed river basins; • Prioritise alternatives that minimise the area flooded per unit (GWh) of energy; • Prioritise alternatives that maximise opportunities for, and do not pose significant unsolvable threats to, vulnerable social groups; • Prioritise alternatives that enhance public health and/or minimise public health risks; • Prioritise alternatives that minimise population displacement; • Prioritise alternatives that avoid exceptional natural and human heritage sites; • Prioritise alternatives that have lower impacts on rare, vulnerable or threatened species, maximise habitat restoration and protect high quality habitats;

	• Prioritise alternatives that can achieve or complement community-supported objectives in downstream areas; and • Prioritise alternatives that have associated catchment management benefits and lower sedimentation. *Source: Key criteria that should be used in comparing hydro-electric project alternatives (International Hydropower Association, 2004, "IHA Sustainability Guidelines")*

TOPIC 6: Environmental flows and downstream regulation

This topic addresses downstream flow regulation and environmental flows including sediment flushing, nutrient flows and navigation for a hydropower project or a group of projects in a multi-reservoir system.

The intent is that hydropower will be developed in a way that maintains the required downstream flow regulation, including environmental flows required in a basin to sustain ecosystems, social and socio-economic systems. **(see Guidance Notes)**

Criterion 6.1 Environmental Flow Assessment (EFA) (see Guidance Notes)

5 – In addition, the management framework in the basin for downstream flow regulation and environmental flows, includes provision for adaptation to future climate change (and other) scenarios.

4 – In addition, the regulatory framework for hydropower includes downstream flow regulation and environmental flow assessment as a requirement for hydropower project environmental impact assessments, feasibility studies and cumulative impact assessments for groups of projects. Hydropower development is consistent with and achieves environmental flow targets and objectives set for the basin under formal plans and agreements. Environmental flows for hydropower operations go beyond minimal release requirements and have a scientific basis.

3 – A basin-wide (transboundary) flow regulation and water allocation management plan is in place which includes objectives for environmental flows. A basin-wide scientific understanding of environmental flow requirements (water quality, quantity, timing and duration of water flows, sediment and nutrient flows) to maintain ecosystem integrity and social systems is in place. Hydropower feasibility studies address downstream flow regulation and environmental flow requirements.

2 – Assessment of downstream flow regulation or environmental flows in the basin exists but there are significant gaps and/or the flow assessment is not linked to hydropower project impact assessments. Policies exist but significant gaps and/or not transboundary.

1 – No EFA policy or downstream flow regulation or environmental flow assessment for the basin or project(s).

Criterion 6.2 Structural provision and operational procedures for sediment management and sediment flushing during all project stages (see Guidance Notes)

5 – In addition, engineering improvements are assessed and implemented where possible for existing dams. A process of ongoing monitoring, research and review is in place and

improvement in practices over time can be demonstrated. Hydropower management of sediment flows is highly integrated with management approaches of other sectors (e.g. agriculture and fisheries).

4 – In addition, a regulatory framework including requirements for compliance with standards set for the basin is in place and implemented to ensure structural and operational provisions are/will be applied consistently across the basin (including transboundary) to achieve sediment management objectives. A basin-wide sediment management agreement is in place which includes objectives for sediment flows.

3 – A regulatory framework and agreed standards exists for the structural and operational requirements of hydropower projects to manage sediment transport at all project stages, including construction. Hydropower operations have/will have sediment management plans, including environmentally friendly sediment flushing and are consistent with regulatory framework.

2 – Regulations and/or management plans for sediment management exist but significant gaps. Studies of sediment transport but significant gaps or not basin-wide. Evidence of sediment management in hydropower operations and structures exists but is not consistent or significant gaps.

1 – No structural or operational provision for sediment flushing for existing or proposed dams in the basin is evident.

Criterion 6.3 Structural provision and operational procedures for downstream flow regulation, including transboundary considerations (see Guidance Notes).

5 – In addition, engineering improvements are assessed and implemented where possible for existing dams. A process of ongoing monitoring, research and review is in place and improvement in practices over time can be demonstrated. Hydropower management of environmental flows is highly integrated with management approaches of other sectors (e.g. irrigation and fisheries).

4 – In addition, hydropower operations have/will have downstream flow management agreements (transboundary) consistent with basin objectives for downstream flow regulation and environmental flows that include structural provisions and operational procedures and consistency in dams across the basin or in a cascade (including transboundary).

3 – A regulatory framework exists for the basin (transboundary) that sets standards for the structural and operational requirements of dams to manage downstream flow requirements (e.g. multi-level outlets). Requirements for downstream flow regulation and environmental flows are addressed in hydropower project feasibility, siting and design studies and include co-ordinated and consistent management approaches for multiple projects in a basin or cascade.

2 – Regulations and/or management plans for environmental flows exist but significant gaps. Studies of environmental flow requirements exist but significant gaps or not basin-wide. Evidence of environmental flow or minimum release in hydropower operations and structures exists but is not consistent or significant gaps.

1 – No structural or operational provision for sediment flushing for existing or proposed dams in the basin is evident.

Criterion 6.4 Flood and drought management and floodplain protection

5 – In addition, a co-ordinated agreement between hydropower operators and national line agencies/basin planning authorities to achieve the objectives of flood and drought management plans in the basin and protect ecosystem integrity is in place.

4 – In addition, hydropower development and operation is embedded into national and transboundary flood and drought management agreements.

3 – Flood and drought management policies, plans and provision are in place at the national and basin level. Hydropower assessment includes opportunities and risks for flood and drought management in feasibility studies whilst also addressing the importance of flood events (e.g. flood pulse) for ecosystem integrity and floodplain productivity.

2 – Planning for flood and drought management in the basin and hydropower contributes to flood and drought management but in a minor way.

1 – No flood or drought management plans in place for hydropower development in the basin.

Criterion 6.5 Maintaining the flow of nutrient rich silt

5 – In addition, an ongoing process of monitoring, research and review to improve understanding of the impact of dams on nutrient flows and improvements in practices is evident over time.

4 – In addition, negotiated compensation agreements are/will be in place where hydropower results in loss of productivity to floodplain agriculture or fisheries for existing and new projects.

3 – A basin-wide understanding of nutrient rich sediments and their role in ecosystem function and floodplain productivity is in place. Hydropower operational and structural provisions for sediment flows include consideration of nutrient flow requirements. A regulatory framework exists that requires hydropower developers to quantify the impacts to floodplain agriculture and fisheries as a result of dam impeded nutrient flows.

2 – Studies of nutrient rich sediment flows in the basin but not comprehensive or basin-wide. Minimal consideration of nutrient flows in hydropower assessment.

1 – Nutrient rich silt has not been considered as an important ecosystem function or considered in hydropower assessment.

Criterion 6.6 River transport and navigation locks

5 – In addition, all hydropower projects in a cascade have/will implement consistent river transport design specifications and performance standards allowing for minimal impact to the flow of water traffic.

4 – In addition, river transport planning in hydropower development includes a process of meaningful consultation with groups dependent on river transport for their livelihoods.

3 – A basin-wide river transport policy framework is in place that sets objectives and management requirements for river transport. Structural provisions for river transport (e.g. navigation locks) are addressed in hydropower detailed design reports.

2 – Assessment of river navigation impacts in the basin with minor gaps but limited provisions for navigation in hydropower or basin planning.

1 – No assessment of river navigation impacts in hydropower or basin planning.

Topic 6 Guidance Notes

Topic 6 Examples of Evidence: 1. National EFA policy, 2. Basin EFA policy, 3. EIA regulations for EFA, 4. Environmental flow studies, 5. Project EIA studies, 6. Project feasibility studies, 7. Optimisation studies, 8. Hydropower design reports, 9. Hydropower operational procedures and plans, 10. Photographic evidence of dam structures, 11. National and regional flood and drought management plans, 12. Policies and agreements for flood and drought management, 13. Project feasibility and optimisation studies, 14. Basin navigation studies, 15. Navigation policies/regulations for the basin, 16. Sediment flow studies, 17. Environmental (and construction) management plans.	
Criteria	**Guidance Notes**
Topic description	Environmental flows, sediment flushing and navigation have been intentionally placed together in this topic. The reason is that they require the same management measures to ensure sustainable development. The two key environmental flow management measures for dams are i) the structural provisions and ii) the operational provisions of hydropower dams. These are described in more detail below.
Criterion 6.1	**Environmental Flows** – the quality, quantity, timing and duration of water flows required to maintain the components, functions, processes and ecosystem resilience of aquatic ecosystems which provide goods and services to people (TNC 2006). Environmental flows in this topic include consideration of sediment and nutrient flows as important ecological processes relating to fisheries and floodplain productivity.
Criteria 6.2 and 6.3	Structural provisions for environmental flow, sediment flushing and navigation include: • variable outlet and turbine generator capacities; • multi-level, selective withdrawal outlet structures; • sediment bypass structures and sediment sluice gates; and • navigation locks.
Criteria 6.2 and 6.3	Operational provisions for environmental flow, sediment flushing and navigation includes: • co-ordinated operations of cascades of dams; • re-regulation of reservoirs; • re-operations of existing dams; • flood management procedures in floodplains; and • flexibility to modify dam operations in the future.

TOPIC 7: Fish passage and fisheries management

This topic addresses basin-wide fisheries management requirements for hydropower development including fish passage and the protection of upstream and downstream fisheries resources in a basin.

The intent is that hydropower is developed in a way that allows for the protection and further development of fisheries resources in a basin.

Criterion 7.1 Understanding and monitoring of fisheries resources

5 – In addition, improvement in hydropower fisheries management practices and understanding of requirements to maintain fisheries productivity can be demonstrated over time.

4 – In addition, basin studies and hydropower impact assessments include a process of meaningful consultation with fisheries dependent communities. Agreements exist for monitoring and research into fisheries resources between the two sectors. Impacts on fisheries resources from hydropower operations are monitored and results inform improved practices and standards.

3 – A basin-wide understanding of fisheries resources, critical habitats, ecosystem processes and migration requirements is in place as a result of comprehensive scientific assessment. A regulatory framework is in place in the basin that includes protection of fisheries resources and requires that hydropower environmental impact and cumulative impact assessments address the impact of hydropower on fish migration, fisheries resources and fisheries dependent livelihoods. Hydropower complies with these requirements/or conducts assessment to minimum acceptable international standards.

2 – Basin-wide studies into fisheries resources but significant gaps. Hydropower impact assessments include consideration of impact to fisheries but significant gaps or not applied consistently.

1 – No basin-wide or hydropower studies on fisheries resources.

Criterion 7.2 Policy, regulations and practices for fish management in hydropower

5 – In addition, hydropower development is highly integrated with fisheries management practices in the basin and hydropower development contributes to the achievement of management objectives for fisheries management in the basin.

4 – In addition, negotiated agreements (transboundary) are in place with hydropower operators for the management of fisheries resources during all stages of hydropower development. The agreements are based on a process of meaningful consultation with fisheries dependent communities and ensure no net loss of fisheries resources.

3 – A national (transboundary) regulatory framework is in place for the protection of fisheries resources and includes provision for the approval and implementation of fish management plans, fish passage requirements and the monitoring of compliance against management plans for hydropower developers and operators. Hydropower development is consistent with these requirements/or meets minimum acceptable international standards for fisheries protection.

2 – Regulatory framework is in place but there are significant gaps and/or the policies and plans are not applied to hydropower development. Evidence of fish management practices in hydropower development is evident but significant gaps.

1 – No policies or regulations in place for the protection of fisheries resources and/or hydropower development occurs without assessment of fisheries impacts.

Criterion 7.3 Structural and operational provision for fish passage

5 – In addition, engineering improvements are assessed and implemented where possible for existing dams. A process of ongoing monitoring, research and review is in place and improvement in hydropower structural provisions and operational procedures over time can be demonstrated. Hydropower operations are highly integrated with the fisheries sector.

4 – In addition, structural and operational provisions are/will be applied consistently in dams across the basin (including transboundary) to achieve fisheries management objectives. A monitoring program is in place to monitor the performance of fish passage structures and operational procedures.

3 – A regulatory framework exists that sets standards for the structural and operational requirements of dams to manage fish passage requirements, including requirements for co-ordinating with other operators. Fisheries resource management and fish passage are assessed in hydropower project feasibility and design studies and include cumulative assessment for multiple projects, consistent with the regulatory framework.

2 – Regulations and/or management plans for fish management exist but significant gaps. Studies of fisheries resources exist but significant gaps or not basin-wide. Evidence of fish management in hydropower operations and structures exists but is not consistent or significant gaps.

1 – No structural or operational provision for fish management for existing or proposed dams in the basin is evident.

Criterion 7.4 Protection of upstream and downstream fisheries and development of reservoir fisheries

5 – In addition, a process of ongoing monitoring, research and review is in place to improve productivity of reservoir, upstream and downstream fisheries. Improvement in hydropower management practices of fisheries over time can be demonstrated. Hydropower management of upstream, downstream and reservoir fisheries is highly integrated with management approaches of the fisheries sector.

4 – In addition, management plans and negotiated agreements are in place and set objectives for the development and management of reservoir, upstream and downstream fisheries. Hydropower development is consistent with the objectives of fisheries management plans and agreements and includes compensation agreements where impacts to the fisheries sector are unavoidable.

3 – A basin-wide understanding of the habitat range and migration requirements of fish is in place and informs hydropower impact assessments. Hydropower environmental and cumulative impact assessment studies address the impact of dam structures and operations on upstream and downstream fisheries (transboundary) and the requirements for the establishment of reservoir fisheries.

2 – Studies of fish migration and habitat range conducted but not basin-wide or significant gaps. Hydropower impact assessments consider upstream and downstream fisheries but significant gaps or minimal evidence of management practices put in place.

1 – No or minimal assessment of fisheries issues in hydropower impact assessment.

Topic 7 Guidance Notes

Topic 7 Examples of Evidence: 1. National fisheries policies and regulations, 2. Basin fisheries policies and plans, 3. EIA regulations for fish, 4. Ecological and habitat assessments, 5. Project EIA studies, 6. Project feasibility studies, 7. Optimisation studies, 8. Hydropower design reports, 9. Hydropower operational procedures and plans, 10. Photographic evidence of dam structures, 11. Project feasibility and optimisation studies, 12. Fish conservation management plans, 13. Environmental (and construction) management plans.	
Criteria	**Guidance Notes**
Criterion 7.3	Structural and operational provisions for fish passage includes: • fish passage structures; • co-ordinated operations of cascades of dams; • re-regulation of reservoirs; • flood management procedures in floodplains; and • flexibility to modify dam operations in the future.

TOPIC 8: Sharing of benefits and use of innovative financing measures for sustainability (local and transboundary)

This topic addresses equitable distribution of project benefits to different groups within the river basin and across jurisdictions.

The intent is that the benefits from hydropower development (e.g. water and energy services, export revenue) are distributed equitably, in particular to locations where impacts are experienced (e.g. villages, protection of high value sites).

Criterion 8.1 Sharing of project benefits

5 – In addition, a formal process of free and prior informed consultation has/will be conducted in conjunction with good faith negotiations to resolve benefit sharing issues. It can be demonstrated that existing and future hydropower development has/will have broad community support at the local and basin scale. An ongoing process of monitoring and review for benefit sharing mechanisms is in place.

4 – In addition, benefit sharing arrangements are/will be negotiated with affected communities, bound in formal agreements or contracts and legally enforceable across jurisdictions for the life of the project. Transboundary benefit sharing mechanisms are in place and implemented.

3 – A regulatory framework for benefit sharing is in place at the local, national and basin levels and government agencies in consultation with the hydropower sector address the following benefit sharing criteria:

- transboundary benefit sharing;
- equitable sharing of project services (water, electricity, other infrastructure);

- protection of natural resource access entitlements/permission;
- project revenue sharing across the affected basin communities including project affected communities and vulnerable social groups;
- revenue allocated to environmental protection in the basin; and
- inclusion of vulnerable social groups, indigenous peoples and ethnic minority groups in benefit sharing negotiations at the local level.

2 – Benefit sharing assessments are conducted for projects but not comprehensive or inclusive of all groups in different jurisdictions. No legal framework in place and/or some policies but not enforceable.

1 – No assessment of natural resource access entitlements or how project benefits can be shared across the basin, no legal mechanisms in place.

Criterion 8.2 Equitable water resource allocation between sectors and countries

5 – In addition, it can be demonstrated that practices for the equitable use of water resources are monitored and improved over time and that hydropower contributes to the equitable use of water resources between sectors and countries. Hydropower operations allow for adaptation to future water allocation scenarios.

4 – In addition, negotiated and legally binding agreements are in place between upstream and downstream water users and sectors in different countries. Agreements are developed through a process of meaningful consultation with other water resource users in the basin. Water allocated for the generation of hydropower is consistent with water allocation agreements. Compensation agreements exist for water users impacted in their access to water resources as a result of hydropower operations.

3 – A basin-wide water resource allocation regulatory framework is in place and addresses water allocation between different sectors (e.g. irrigation, hydropower, fisheries, domestic and industrial water supply). It addresses transboundary water allocation and equitable sharing of the water resource between upstream and downstream users. Hydropower development is consistent with the regulatory framework.

2 – Water resource allocation planning exists but significant gaps or not equitable between countries and sectors and/or hydropower planning addresses equitable water use downstream but significant gaps.

1 – No consideration of equitable use of water resources between different sectors or countries in the basin or in hydropower development planning.

Criterion 8.3 Payment for ecological services (PES) (see Guidance notes)

5 – In addition, PES scheme is accompanied by communication and awareness campaigns to raise awareness of sustainable land use practices in the basin. Funds raised from the PES scheme are allocated to support traditional resource managers and management practices in the basin.

4 – In addition, PES scheme(s) is negotiated and bound in formal agreements or contracts between parties, consistent with national laws (which may be in different jurisdictions) and supported by a long term sustainable financing model and a robust monitoring and review process.

3 – A basin-wide policy or commitment on PES schemes is in place. PES schemes (e.g. planting trees in headwater forests) that lever off hydropower development and contribute to more sustainable land and water management practices in the basin through local action are/will be identified and are/will be implemented in the basin.

2 – Assessment of PES opportunities but not comprehensive or incorporated into planning.

1 – No assessment of PES opportunities.

Criterion 8.4 Carbon financing opportunities to fund sustainability measures

5 – In addition, carbon finance is/will be used to fund hydropower sustainability measures over the long term and to support poverty alleviation in the basin.

4 – In addition, negotiated agreements do/will exist to direct carbon finance to defined sustainability measures in the basin and are/will be implemented.

3 – National and/or basin-wide policy and framework in place to access carbon finance. Assessment of opportunities for carbon financing within the international framework (UNFCCC) is/will be conducted for hydropower development in the basin. Application for finance is made and a model for allocating the revenue is agreed between the developers and national governments.

2 – Some assessment of carbon financing opportunities, but no application made.

1 – No assessment of carbon financing opportunities for hydropower projects.

Criterion 8.5 Project revenue to fund sustainability measures

5 – In addition, improvement in the funding of sustainability measures in the basin from hydropower project revenue can be demonstrated over time.

4 – In addition, legally binding negotiated agreements do/will exist in the basin to direct project revenue to defined sustainability measures in the basin and are/will be implemented.

3 – A regulatory framework for allocating an agreed portion of hydropower project revenue to fund sustainability measures in the basin is in place. Hydropower social, environmental and cumulative impact studies address the financing of sustainability measures in the basin from project revenue and these costs are included in project feasibility studies.

2 – Assessment of project revenue financing opportunities in project feasibility studies, but not comprehensive and/or no evidence of implementation.

1 – No assessment of project revenue related financing opportunities for sustainability measures.

Topic 8 Guidance Notes

Topic 8 Examples of Evidence:
1. Project economic assessments, 2. Resettlement and compensation plans, 3. Benefit sharing agreements, regulations and policies, 4. Negotiated agreements with affected groups, 5. Monitoring and audit reports, 6. Transboundary benefit sharing agreements and regulations, 7. PES policies or incentive schemes, 8. PES agreements, 9. Clean Development Mechanism

(CDM) applications/guidelines, policies, 10. Carbon finance agreements, 11. Revenue allocation agreements, 12. Tariff revenue guidelines, policies, 13. Tariff revenue agreements 14. Revenue allocation agreements.	
Criteria	**Guidance Notes**
Criterion 8.3	**PES Scheme** Payment for ecological services (PES) is a scheme whereby a group or individual dependent on a natural resource for its livelihood will pay another individual or group a sum of money to prevent damage to that natural resource. For example, a downstream community dependent on drinking water from a river paying upstream farmers not to use chemical fertilisers that would pollute the water.

TOPIC 9: Provision for safety and disaster prevention and management

This topic addresses planning for basin-wide dam safety through preparation, implementation and operation periods of projects or groups of projects.

The intent is that life, property and the environment are protected from the consequences of dam failure and other infrastructure safety risks across the basin within and across jurisdictions.

Criterion 9.1 Dam safety management system (DSMS)

5 – In addition, DSMS is/will be applied consistently across the basin and in different jurisdictions. Routine emergency drills and reinforcement of possible evacuation plans are/will be supported by hydropower operators in the basin.

4 – In addition, downstream communities are/will be regularly consulted on all aspects of dam safety and a community awareness program is/will be in place. Plans are/will be developed in conjunction with relevant regulatory authorities and stakeholders across jurisdictions. Plans consider broader issues such as road safety, child safety and drowning risks as a result of hydropower development.

3 – A comprehensive Dam Safety Management System (DSMS) is/will be in place for design, construction and operation stages for hydropower project(s) in the basin. It includes as a minimum, (i) an emergency preparedness plan, (ii) construction supervision, instrument and quality assurance plans during construction, and (iii) an operation and maintenance plan and an annual public dam safety report during the operation period. It meets accepted standards for dam safety and has been subject to independent expert review. It includes a process of continual improvement.

2 – Dam safety system evident but does not comply with international standards.

1 - Very poor or absent dam safety practices.

Criterion 9.2 Consistency across basin/cascade

5 – In addition, operators do/will co-operate with each other to comply with all aspects of the dam safety management plan and have a process of continual improvement. Emergency equipment, vehicles, communication equipment and other safety measures are harmonised across all operators to facilitate seamless cooperation in the event of an emergency.

4 – In addition, downstream communities are/will be regularly consulted on all aspects of dam safety and issues raised are addressed in a timely manner. Compensation is routinely provided to project affected communities for any accidental damage caused during construction or operations.

3 – A basin-wide policy and implementation framework for dam safety is in place. All projects in the basin use a consistent approach to dam safety including provisions (e.g. dams, spillways, structures etc), plans, and monitoring and management systems. Dam owners co-operate with each other to address basin-wide/cascade dam safety issues.

2 – Co-ordination between different dam owners and some consistency in approach but significant gaps.

1 – No consistency of approach or co-ordination between operators within a sub-basin or cascade.

Criterion 9.3 Emergency preparedness plans (EPP) and co-ordination

5 – In addition, operators do/will co-operate with each other to comply with all aspects of the EPP and have a process of continual improvement and refresher training for all staff.

4 – In addition, different operators in a cascade or sub-basin do/will co-ordinate with each other and share resources to develop basin-wide/cascade EPP.

3 – A hydropower emergency preparedness plan of international standards has been/will be developed for a project or group of projects in a cascade in conjunction with relevant regulatory authorities and stakeholders across jurisdictions The EPP includes as a minimum, consistent signage, exclusion zones, dam release notification and warning systems, community awareness, emergency preparedness, flood management, monitoring, inspections, training, incident response, communication, and allocation of responsibilities.

2 – An EPP in place but does not meet accepted standards.

1 – No EPP for hydropower projects.

Criterion 9.4 Dam break and other analysis prepared for projects in cascades

5 – In addition, operators co-operate with each other to comply with all aspects of the cascade DSMS and have a process of continual improvement and refresher training for all staff.

4 – In addition, operators in a cascade do/will prepare a cascade DSMS in consultation with relevant authorities and stakeholders.

3 – Dam break and other analysis is/will be prepared for projects in cascades to consider a dam break scenario in a cascade context. Dam safety plans address impact of dam break on downstream dams in a cascade and appropriate structural and operational mitigation strategies are in place where risk and uncertainty warrants inclusion as part of the DSMS.

2 – Dam break analysis for cascade of dams but significant gaps and/or minimal plans in place to address operational issues.

1 – No dam break analysis for cascade of dams.

Criterion 9.5 Emergency flood management

5 – In addition, hydropower is/will be embedded into national emergency flood management plans which include the flexibility to prioritise flood management over other operational considerations during emergency flood events.

4 – In addition, there is/will be a high level of integrated planning for emergency flood management between key players and potentially affected communities.

3 – Emergency flood management plans and policies are in place for the basin and include co-ordination between jurisdictions. Integrated planning for emergency flood management is evident between river basin authorities, line agencies responsible for hydropower and hydropower operators.

2 – Hydropower planning for emergency flood management in basin but significant gaps and/or only to protect the structure(s).

1 – No plans in place to address emergency flood management.

Topic 9 Guidance Notes

Topic 9 Examples of Evidence:
1. Dam Safety Management System (DSMS) documentation, 2. Dam safety risk assessment reports 3. Independent auditing and monitoring reports, 4.Integrated dam safety risk assessment reports, 5. Emergency Preparation Plan (EPP), 6. Integrated EPP for the basin, 7. Training programs, 8. Community awareness programs 9. Dam break analysis reports for projects in a cascade 10. National and regional emergency flood management plans and policies.

TOPIC 10: National and basin-wide institutional setting

This topic addresses the regulatory framework for hydropower within and across jurisdictions and the institutional capacity building needs.

The intent is that an effective regulatory framework underpinned by sustainability principles, governed by institutions with adequate capacity and including mechanisms for co-operation between the various stakeholders and jurisdictions should lead to sustainable hydropower development.

Criterion 10.1 Sustainable hydropower – roles and allocation of responsibility

5 – In addition, groups with roles and responsibility are/will be adequately resourced, politically supported and have access to the information and tools required to carry out their duties. A process of ongoing review and improvement is in place.

4 – In addition, roles and responsibilities for transboundary co-operation in different jurisdictions are included and effectively implemented.

3 - The roles and responsibility of national line agencies, river basin organisations (RBO), hydropower developers and operators and other stakeholders in all jurisdictions in the basin to address the various aspects of hydropower sustainability are/will be bound in commitments, agreements, legislation, policies and/or regulations.

2 – Informal allocation of responsibilities, not supported by agreements, adequate resources or legal framework.

1 – No clear allocation of roles and responsibilities or resources available.

Criterion 10.2 Co-ordination mechanisms between key stakeholders

5 – In addition, mechanisms include joint planning and decision making and regular structured meetings to resolve sustainability issues.

4 – In addition, co-ordination obligations are formalised in policies, agreements and/or regulations and includes co-ordination with provincial and sub-provincial governance entities appropriate to the planning context.

3 – Co-ordination mechanisms exist between RBOs, national line agencies and hydropower developers/operators and include open two-way sharing of data and information and agreed lines of communication.

2 – Co-ordination and data sharing between key stakeholders but informal and unstructured.

1 – No evidence of co-ordination between key stakeholders.

Criterion 10.3 Transboundary notification, conflict resolution and communication

5 – In addition, different jurisdictions engage in joint planning and decision making on hydropower sustainability issues. Adequate sanctions and dispute resolution mechanisms are in place for failing to meet agreed obligations.

4 – In addition, mechanisms are bound in bilateral and/or multilateral agreements between the different jurisdictions and adhered to.

3 – Mechanisms for notification of new projects, conflict resolution and communication on hydropower sustainability issues between various jurisdictions sharing a basin or sub-basin are formally in place and implemented as intended.

2 – Informal processes in place, applied in an *ad hoc* manner.

1 – No notification, conflict resolution or communication across jurisdictions.

Criterion 10.4 Monitoring, review and compliance provisions

5 – In addition, compliance and monitoring reports are publicly available, translated into local languages, and independently verified. Learning from past development in the basin or elsewhere is incorporated into future development as part of continuous improvement.

4 – In addition, financing for monitoring, review and compliance is secured and long term and built into hydropower permitting schemes and development agreements.

3 – Responsibilities for monitoring, review and compliance of hydropower projects with all relevant sustainability requirements are allocated and responsible entities are adequately resourced and supported. Monitoring and review programs are effectively implemented and resourced.

2 – Monitoring and review but not comprehensive and responsibilities not clear and inadequate resources allocated.

1 – No provision for monitoring, review and compliance.

Criterion 10.5 Sustainability principles in hydropower agreements

5 – In addition, the sustainability principles are consistently applied to MOU's and agreements across all jurisdictions in the basin.

4 – In addition, the sustainability principles underpin the regulatory framework for hydropower projects and there is a high level of integration between basin planning and hydropower development to achieve sustainability objectives.

3 – Memorandums of Understanding (MOU), Power Development Agreements (PDA), Power Purchasing Agreements (PPA) and Concession agreements in the basin embody sustainability principles and flexibility for adaptive management.

2 – Mention of sustainability principles in agreements but not consistent or comprehensive.

1 – No mention of sustainability principles in MOUs and agreements.

Criterion 10.6 Capacity building plans for key agencies and River Basin Organisations and Committees (RBO/RBC)

5 – In addition, comprehensive, active and well funded capacity building activities for transboundary co-operation and improvement of integrated planning are in place and implemented.

4 – In addition, the plan is adequately resourced to meet the demands and pace of hydropower development in the basin and applied consistently in all relevant jurisdictions. It addresses building the capacity of stakeholders to interact and speak on behalf of their interests.

3 – A capacity building plan is/will be in place for key national line agencies, RBO's and hydropower stakeholders in the basin targeting improved understanding of hydropower sustainability issues and measures and the multi-stakeholder approaches to resolving issues.

2 – Capacity of key agencies and stakeholders has been assessed and some planning work to address gaps but not comprehensive or adequately resourced.

1 – Limited understanding of capacity for key agencies.

Topic 10 Guidance Notes

Topic 10 Examples of Evidence: 1. National legislation, policy and regulations, 2. Role descriptions, 3. RBO constitution/governance framework, 4. Budgets and resourcing plans for line agencies and RBOs, 5. RBO funding, 6. Agreements – data sharing, notification etc.,

7. Evidence of meetings, agendas, 8. Policies and regulations, 9. Transboundary conflict resolution agreements, 10. Transboundary notification agreements, 11. Hydropower plans, 12. Transboundary EIA policies and reports, 13. SEA reports, 14. Line agency budgets and allocated positions, 15. Monitoring and auditing reports, 16. Compliance reports, 17. Hydropower monitoring reports, 18. Hydropower agreements (PDAs and PPAs) and MOUs, 19. National policies relevant to hydropower, 20. Capacity building plans for line agencies and RBOs.

TOPIC 11: Communication, basin stakeholder and community support for hydropower development

This topic addresses public participation, communication and community support for hydropower development.

The intent is that the hydropower development decision making process is based on principles of informed participation, representation (including marginalised groups) and open and transparent communication for all affected stakeholders across jurisdictions and that hydropower development has/will have broad community support in the basin.

Criterion 11.1 Strategic communication and awareness of sustainable hydropower – principles and practices

5 – In addition, formal communication agreements between stakeholders, representative committees and regulatory agencies exist. Improvement in strategic communication on hydropower sustainability issues is evident over time.

4 – In addition, formal lines of communication with hydropower stakeholders are established and formalised through representative committees, basin organisations and other relevant institutions. Communication between countries on hydropower sustainability issues sharing a river basin is formalised and occurs effectively.

3 – The principles of sustainable hydropower underpin the regulatory framework for hydropower development and basin planning. Sustainability principles are well communicated and expectations for sustainable basin development and the roles of different stakeholders are formalised in policy and regulations. Hydropower stakeholders are well informed of hydropower sustainability issues, how they will be affected and what rights they have to participate in the hydropower planning process.

2 – Communication between basin planners, hydropower developers and operators and stakeholders on sustainable hydropower but significant gaps and limited practices in place in the basin.

1 – No communication with stakeholders on sustainable hydropower issues, limited understanding of sustainable hydropower principles and practices across the basin.

Criterion 11.2 Informed participation and representation in hydropower development decision making at all stages of the project cycle (See Guidance Notes)

5 – In addition, hydropower development in the basin has broad community support and review and monitoring of stakeholder concerns and community support in the basin is ongoing and future development is informed by the learning of past experiences.

4 – In addition, management plans are implemented in accordance to legal requirements and agreements and the process of informed participation is in place for the life of the projects and includes grievance mechanisms.

3 – Policy, regulations and an implementation framework are in place and implemented at the national and basin level for meaningful and free and prior informed consultation and good faith negotiations to be an integral part of the hydropower development process at all stages of the project life cycle. Hydropower development in the basin is/will be consistent with national and international standards for informed participation.

2 – Policies or regulations exist but significant gaps and/or not effectively implemented. Identification of stakeholders is limited and consultation process has minimal impact on decision making.

1 – No engagement with project stakeholders, significant opposition to hydropower in the basin.

Criterion 11.3 Information sharing and access to data and reports

5 – In addition, formal agreements are in place for the sharing of basin-wide and hydropower data between different stakeholders (in different countries) and data is stored and maintained in a way that it is easily accessible. Data is shared openly between different hydropower developers, operators and other water users in the basin to allow for open consultation on key issues and achievement of sustainability objectives in basins with multiple projects or cascades.

4 – In addition, a regulatory framework exists for the regulatory and public reporting of hydropower data and information and project notification. Hydropower development information, feasibility studies and technical reports are available for use in environmental and cumulative impact assessments.

3 – Basin-wide data is available to different hydropower stakeholder groups and hydropower assessment reports are accessible to government line agencies (in different countries) and river basin organisations, with information on hydropower development being available to the public where appropriate. Information is shared between different hydropower operators and developers and other water users when required for joint planning of sustainability issues (e.g. environmental flows, fish passage).

2 – Information sharing is in place but limited and not all information shared with key stakeholders or other local, national or transboundary institutions in the basin.

1 – No information sharing or public availability of data or reports.

Criterion 11.4 Basin level community support for hydropower (see Guidance Notes)

5 – The hydropower development receives broad community support from project affected groups and the basin population.

4 – For the project or group of projects, community support is high and/or there is no significant opposition.

3 – Community support is assessed at the early stages of project preparation. Project affected communities are engaged in a meaningful consultation process throughout the hydropower development stages.

2 – Some affected groups supportive of project but opposition is strong in the basin.

1 – Significant widespread opposition to the project or group of projects within the basin by project affected communities and other stakeholders.

Criterion 11.5 Integration of operations in watershed/catchment management

5 – In addition, formal negotiated agreements are in place to address sustainability issues in the watershed. Hydropower operations are an integral part of water shed management and contribute to sustainable watershed management.

4 – In addition, a process of meaningful consultation with other water and natural resource users in the watershed with hydropower operators is in place and planning results in the equitable use of the watershed's resources and the achievement of sustainability objectives.

3 – Watershed and catchment management planning systems are in place to provide a management framework for different water and natural resource uses in the basin. Hydropower operations are integrated with watershed management.

2 – Integration evident but limited and significant gaps.

1 – No integration of hydropower operations in watershed/catchment management.

Topic 11 Guidance Notes

Topic 11 examples of evidence: 1. Evidence of good faith negotiations, 2. Evidence of opposition – protests, media, petitions etc., 3. Evidence of support – absence of opposition, 4. Information provided to stakeholders – accuracy and quality of communication, 5. Watershed plans, 6. Hydropower strategic communication.	
Criteria	**Guidance Notes**
Criterion 11.2	**Meaningful Consultation** – is a process that (i) begins early in the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making such as project design, mitigation measures, the sharing of development opportunities and benefits, and implementation issues. Particular attention will be paid to the needs of disadvantaged or vulnerable groups, especially those below the poverty line, the landless, the elderly, female headed households, women and children, Indigenous Peoples and those without legal title to land. (ADB 2009)

Criterion 11.2	**Free and Prior Informed Consultation** – involves organised and interactive consultation (meaningful consultation), leading to the client's incorporating into their decision making process the views of the affected communities on matters that affect them directly, such a proposed mitigation measures, the sharing of development benefits and opportunities and implementation issues. The decision making process should be documented, in particular the measures taken to avoid or minimise risks and adverse impacts on the affected communities. (IFC 2006)
	Good Faith Negotiations – Good faith negotiations are those that have involved a full and frank disclosure of all available information and that were entered into with an honest view to reaching an agreement. (Australian Institute of Aboriginal and Torres Strait Islander Studies). If Good faith negotiations fail to reach an outcome an independent conflict resolution process should be initiated.
Criterion 11.4	**Broad Community Support** – a collective expression by the affected communities through individuals and/or their representatives of broad community support for the project activities. Such broad community support may exist even if some individuals or groups object to the project activities. (ADB 2009)

Definitions

Bilateral agreements – agreements and relations between two parties; two sovereign states.

Biodiversity – the variation of life forms within a given ecosystem, biome, or on the entire Earth. Biodiversity is often used as a measure of the health of biological systems.

Biodiversity hotspot – a site with a significant reservoir of biodiversity that is biologically richest and under threat from humans.

Carbon finance – the revenue generated under a United Nations Framework Convention on Climate Change (UNFCCC) arrangement which allows industrialised countries with an emissions reduction commitment to invest in ventures that reduce emissions (e.g. planting trees) in developing countries.

Community groups – groups of people with common characteristics or interests living together within the larger society. There are many different ways to view these groups, and these will need to be defined in meaningful ways for the project. These may include, by way of example, urban dwellers, rural dwellers, indigenous peoples, ethnic minorities, people of a common profession or religion, disabled, elderly, illiterate, women, men, children, etc.

Compliance – addresses the level of conformity with legal requirements and other public commitments that have been made for particular aspect.

Cumulative impacts – the phenomenon of changes that result from numerous human-induced alterations, in this case the impact of multiple dams in a basin as opposed to one dam.

Development plans – are an aspect of town and country planning comprising a set of documents, which set out the local authority policies and proposals for the development and use of land in an area. The development plan guides and informs day to day decisions as to whether or not planning permission should be granted. In order to ensure that these decisions are rational and consistent, they must be considered against the development plan adopted by the authority, after public consultation and having proper regard to other material factors.

Directly affected stakeholder – those stakeholders with substantial rights, risks and responsibilities in relation to the issue. These may be outside the project-affected area, such as government regulators, finance institution representatives, or investment partners.

Drainage basin – an extent of land where water drains downhill into a body of water, such as a river, lake, reservoir, estuary, wetland, sea or ocean. The drainage basin includes both the streams and rivers that convey the water as well as the land surfaces from which water drains into those channels, and is separated from adjacent basins.

Economic displacement – loss of assets, access to assets, or income sources or means of livelihoods as a result of (i) acquisition of land, (ii) changes in land use or access to land, (iii) restriction on land use or access to natural resources including water resources, legally designated parks, protected areas or restricted access areas such as reservoir catchments and (iv) changes in environment leading to health concerns of impacts on livelihoods. Economic displacement applies whether such losses and restrictions are full or partial, and permanent or temporary.

Ecosystem – the combined physical and biological components of an environment. An ecosystem is generally an area within the natural environment in which physical (abiotic) factors of the environment, such as rocks and soil, function together along with interdependent (biotic) organisms, such as plants and animals, within the same habitat. Ecosystems can be permanent or temporary.

Ecosystem functions – the physical, chemical, and biological processes or attributes that contribute to the self-maintenance of an ecosystem; what the ecosystem does.

Ecosystem integrity – including key habitats, species range and migratory needs, ecosystem connectivity, nutrient flow and food web.

Ecosystem health monitoring – describes the processes and activities that need to take place to characterise and monitor the quality and health of the environment/ ecosystem.

Ecosystem services – resources and processes that are supplied by natural ecosystems. Ecosystem services can be grouped into four broad categories: provisioning, such as the production of food and water; regulating, such as the control of climate and disease; supporting, such as nutrient cycles and crop pollination; and cultural, such as spiritual and recreational benefits.

Ecosystem values – the environmental, economic, social values of an ecosystem.

Environmental quality – the status and health of the environment.

Environmentally friendly sediment flushing – the passing of sediment trapped upstream of a dam to the downstream environment in a way that does not have a negative impact on the downstream ecosystem or community.

Environmental Flows – the quality, quantity, timing and duration of water flows required to maintain the components, functions, processes and ecosystem resilience of aquatic ecosystems which provide goods and services to people (TNC 2006).

Environmental health data – any information or data on the health of the environment.

Evidence – evidence provided and used by an assessor to verify whether and to what degree an attribute has been met. Evidence can be qualitative or quantitative information, records or statements of fact, either verbal or documented. It is retrievable or reproducible; not influenced by emotion or prejudice; based on facts obtained through observations, measurements, documentation, tests or other means; factual; objective and verifiable.

Feasibility studies – consider current and future potential use of natural resources and the opportunity cost of hydropower to natural resources use.

Free and Prior Informed Consultation – involves organised and iterative consultation, leading to the client's incorporating into their decision making process the views of the affected communities on matters that affect them directly, such as proposed mitigation measures, the sharing of development benefits and opportunities and implementation issues. The decision making process should be documented, in particular the measures taken to avoid or minimise risks and adverse impacts on the affected communities. (IFC 2006)

Good faith negotiations – Good faith negotiations are those that have involved a full and frank disclosure of all available information and that were entered into with an honest view to reaching an agreement. (Australian Institute of Aboriginal and Torres Strait Islander Studies). If Good faith negotiations fail to reach an outcome an independent conflict resolution process should be initiated.

Habitat – an ecological or environmental area that is inhabited by a particular species of animal, plant or other type of organism.

High value – something that is of high or significant environmental value.

Integrated – merged, interspersed and embedded into something.

IWRM – integrated water resource management planning.

International agreement/treaty – an agreement under international law entered into by actors in international law, namely sovereign states and international organizations.

Jurisdiction – is the practical authority granted to a formally constituted legal body or to a political leader to deal with and make pronouncements on legal matters and, by implication, to administer justice within a defined area of responsibility.

Line agencies – agencies at national or sub-national level which carry out policies and provide services.

Livelihood – refers to the capabilities, assets (stores, resources, claims and access) and activities required for a means of living.

Management system – the framework of processes and procedures used to ensure that an organisation can fulfil all tasks required to achieve its objectives.

Meaningful consultation – is a process that (i) begins early in the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making such as project design, mitigation measures, the sharing of development opportunities and benefits, and implementation issues. Particular attention will be paid to the needs of disadvantaged or vulnerable groups, especially those below the poverty line, the landless, the elderly, female headed households, women and children, indigenous peoples and those without legal title to land. (ADB 2009)

Mitigation strategies – a strategy that is designed to reduce or eliminate risks to people and property from natural and man-made hazards. Mitigation strategies are supported by state government and federal programs.

Multilateral agreements – agreements and relations between a number of parties; between a number of states.

Multiple-use optimisation studies – studies and methodologies to provide harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of something else, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.

Multiple-use benefits – the broad range of uses for hydropower reservoirs e.g. irrigation, water supply, recreation, navigation.

National agreement – an agreement under national law.

National water policies – water policies that apply to the entire nation.

Natural resources – are derived from the environment (e.g. soil, water, air, biota).

Natural resource dependent industries – any industry which is dependent on a natural resource for its economy and production. For example, hydropower is an industry which is dependent on the availability of water.

Natural state – anything which is in its original state, un-changed by human impacts.

Nutrient rich silt – the silt that is rich in nutrients and is transported along a river in suspension and then deposited on a floodplain. It is an important resource for aquatic ecosystems and floodplain productivity.

Opportunity cost – is the next-best choice available to someone who has picked between several mutually exclusive choices. It is a key concept in economics. It is a calculating factor used in mixed markets which favour social change in favour of purely individualistic choices.

Optimal – best fit, once all considerations have been factored in, based on the outcomes of a consultative process.

Optimisation studies – any study to find the best fit or balance between competing needs.

PES – Payment for ecological services is a scheme whereby a group or individual dependent on a natural resource for its livelihood will pay another individual or group a sum of money to prevent damage to that natural resource. For example, a downstream community dependent on drinking water from a river paying upstream farmers not to use chemical fertilisers that would pollute the water.

Poverty – refers to the condition of not having the means to afford basic human needs such as clean water, nutrition, health care, education, clothing and shelter.

Project-affected area – the catchment, reservoir, and downstream of the project site and associated dams; the area affected by any associated infrastructure developments (e.g. roads, transmission lines, quarries, construction villages, etc); and any area to which project affected people might be relocated.

Project-affected communities – the interacting population of various kinds of individuals living the region that is directly affected by the hydropower project preparation, implementation and/or operation, as well as those who may live outside of the project affected area but are economically displaced by the project.

Rare and endangered species – any species that is listed under State, Territory, Commonwealth, or international legislation or treaties as being 'rare' or 'endangered' in its current form or distribution.

Regional agreement – an agreement under legislation for a particular region.

Regional ecosystem connectivity – the connectivity of an ecosystem at a regional/local scale. Any interactions among individuals or species in an ecosystem can be considered to be connections.

Reservoir storage – artificial lake used to store water.

River navigation locks – is a device for raising and lowering boats between stretches of water of different levels on canal waterways. Locks are used to make a canal more easily navigable, or to allow a canal to take a reasonably direct line across country that is not level.

Sediment flushing/passage – the passing of sediment trapped upstream of a dam to the downstream environment.

Sediment budgeting – an assessment of the quantity, quality, flow, erosion and deposition of sediment in a defined basin area.

Social stability – the absence of significant conflict, tension or division within and between different social groups.

Stakeholder – one who is interested in, involved in or affected by the hydropower project and associated activities.

Stakeholder group – a group of stakeholders with common characteristics or interests.

Sub-basin – a sub-unit in a drainage/river basin defined by a drainage divide.

Sustainable development – development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainability – the capacity to endure; to remain diverse and productive and provide essential needs in the future.

Sustainability criteria – a set of considerations that if adhered to will result in sustainable development.

Transboundary – crossing or existing across national boundaries

Undeveloped rivers – any river section that is not developed and remains in its natural state.

UNFCCC – United Nations Framework Convention on Climate Change.

Vulnerable social groups – social groups who are marginalised or impoverished with very low capacity and means to absorb change.

Watershed – a drainage divide or basin.

Part 2 : Assessment Guide

1. Introduction

This Assessment Guide contains checklists, guidance and forms to support implementation of the RSAT (hereafter, the assessment tool). The assessment team will use this guide which is also available electronically to prepare for the assessment and to conduct the assessment. It contains a step by step guide and a series of checklists and forms. The Main Document contains an introductory and background section to the assessment tool and Appendix A to the Main Document contains the full series of assessment topics and criteria to be used during the assessment.

2. Assessment preparation stage

2.1 Preliminary planning for the assessment

Below is a checklist to be used to provide guidance to the assessment team in preparing for the assessment. It is recommended that the checklist be used to guide discussion at a preliminary assessment planning meeting to assist the assessment team to define the scope and objectives of the assessment and identify what information will be required.

Table 1: Assessment planning and preparation checklist

About the assessment	
Statement of the scope of the assessment – which basin and program of hydropower development is being assessed?	
Why are you doing the assessment? (Refer to Section 2.2 and Table 2 as a guide)	
What is the expected outcome of the assessment? (Refer to Table 2)	
What will the results of the assessment be used for?	
Who will form the assessment team and who will lead the assessment?	
Is scoring necessary for this assessment? (Refer to Table 2)	
If scoring is necessary then an independent verification process is required. Identify who would do independent scoring verification.	
What other tools, projects or initiatives are happening in the basin that are relevant to the assessment? Can the assessment be linked to these other initiatives?	

About the basin	
Does the basin have an RBO or RBC or is there a plan to form one?	
Gather a list of hydropower projects – existing, proposed, under construction etc. for the basin.	
Is there a list of all hydropower operators and developers active in the basin?	
Is there a river basin plan or IWRM plan for the basin being assessed – is information available to the assessment team?	
How will information on all relevant national and transboundary agreements, policies, legislation, standards and regulations for the basin be gathered for each country sharing the basin? Is this information available?	
Is it a transboundary basin? How are the different countries being represented in the assessment and is information and data available for all countries sharing the basin?	
Will the electricity being generated from hydropower be used in the basin or exported outside the basin (or both)?	
Are data and information such as baseline studies of biodiversity, hydrology, cultural heritage sites and socio-economic data available for the basin? Where is the data located and will the assessment team have access to it?	
Is information available from hydropower developers and operators or national government agencies on hydropower project design, siting, feasibility and options studies?	
Which people or institutions with knowledge of the basin, policies and regulations and hydropower development can provide information for the assessment and/or be interviewed for the assessment?	
If data and information is not available or cannot be accessed for the assessment then an assessment can still be conducted and will focus on the gaps in information and the risks associated with the lack of information or the lack of access to information.	
How can all of the data and information for the assessment be stored so it can be used again in the future and updated?	
Assessment outcomes and outputs	
Who is responsible for reporting on the assessment results and who will they be reported to?	
How will the scores be used?	

Where will the information from the assessment be stored and who will need access to the information?	
What will happen to the assessment results after the assessment is complete?	
Who is responsible for the assessment and the follow up from the assessment?	

2.2. Defining the objectives of the assessment

An important part of the preparation for the assessment is to determine the objective of the assessment – why it is being conducted. This section will assist the assessment team to identify their objective, determine whether scoring is necessary and plan how the assessment will be conducted. Eight different objectives for conducting an assessment are described in the table below. Scoring is necessary for some assessments (e.g. for monitoring and comparing different projects or basins). However for some assessments, scoring is not necessary or is optional. For each of the eight different objectives, the table shows the following:

- A description of how the tool can be used for that objective;
- Whether scoring is necessary for a particular objective;
- Who would conduct the assessment;
- What the outputs of the assessment will be; and
- What the outcomes of the assessment will be.

The tool will be used in the same way whatever the objective is. The risk assessment will still be conducted against a scoring framework. However, the objective of the assessment will determine the focus of the discussions, the types of strengths, weaknesses, risks and opportunities that are identified and the actions that are recommended.

The assessment team should read the following table and decide which assessment objective best describes the assessment to be conducted. Once the objective is identified, the team can then determine whether scoring is necessary.

Once the assessment team identifies the objective of the assessment, Section 2.3 describes how the assessment should be conducted to achieve the specific objectives of the assessment.

Table 2: The different objectives of the assessment

Assessment objective	Is scoring necessary?	Assessors/ Users	Outputs	Outcomes
To inform impact assessment studies - As a checklist to guide a Cumulative Impact Assessment (CIA) or Strategic Environmental Assessment (SEA) of hydropower development in a basin.	No	Consultants, government line agency, RBO/RBC	Terms of reference for a CIA or SEA; Checking the scope of CIA/SEA; for use during the studies. To identify what needs to be put in place for basin planning for hydropower.	Improved quality and comprehensiveness of impact assessment studies. Improved consistency between studies.
To assist basin planning organisations - As a planning tool or checklist for river basin agencies (existing or starting up) to identify what needs to be put in place to make the basin ready or improve it for sustainable hydropower development.	Optional	Committee members of the RBO	Action plan for studies, policies, data management and capacity building required to establish RBO/RBC or to position RBO/RBC to provide input into sustainable hydropower.	Improved capacity of river basin agencies to contribute to sustainable basin development.
For prioritising projects/groups of projects - For prioritising hydropower projects in a plan for a basin, or for comparing suitability of different sub-basins for hydropower.	Yes	Energy and environmental line agencies making plans for sustainable hydropower	Prioritised list of projects; Comparison of suitability of different sub-basins.	Improved sustainability decision making and preference for projects with higher sustainability performance.
To inform the development of standards for hydropower projects - For raising the standard of different developments in a basin and developing standards to ensure consistent management approaches.	Yes	RBOs, line agencies and developers	To inform the development of standards for sustainable hydropower development in a basin; identification of measures to enable developers to meet these standards.	Improved standards for hydropower sustainability.

Assessment objective	Is scoring necessary?	Assessors/ Users	Outputs	Outcomes
To create dialogue between different stakeholders - As a methodology to bring together different stakeholders to discuss hydropower sustainability and reach agreement on priorities for future studies and main risks and opportunities for hydropower development in a particular basin.	Optional	Multiple stakeholders	Action plans for progressing hydropower sustainability issues in the basin and better understanding of the roles of the different stakeholders.	Improved working relationships and lines of communication. Clarification of roles and responsibilities.
To monitor hydropower sustainability performance - As a monitoring tool for sustainable hydropower development in a basin over time. Use periodically e.g. every 3 or 5 years to show progress in sustainable hydropower development.	Yes	RBOs, line agencies, international organisations, provinces	State of sustainability of a basin reporting and monitoring.	Better awareness of basin-wide sustainable development and performance of different water users in the basin.
To assist capacity building or training - For training and raising the capacity of staff in government agencies, RBO, stakeholder groups and hydropower companies in hydropower sustainability.	No	RBOs, line agencies and hydropower companies	Action plan for capacity building and training. Training programs developed to meet needs.	Improved capacity and knowledge of the basin and requirements for sustainable hydropower development.
To assess transboundary arrangements -To identify differences in policy and practice in sustainable hydropower development between different countries and administrative areas in a basin.	Optional	Line agencies with responsibility for hydropower development in each country	Action plan to address gaps and inconsistencies in national and transboundary approaches to basin management and hydropower sustainability.	Minimising differences and inconsistencies in policies in different countries that share a river basin.

2.3 Guidance on how to conduct assessment once the assessment objective is determined

Once the assessment team has determined the objective of the assessment, it can then consider how the assessment will be conducted to meet the objectives of the assessment. The sections below provide guidance on how to conduct an assessment for each of the different objectives. For each objective, the assessment team will still use the scoring statements and the risk assessment; however the types of risks, opportunities, strengths and weaknesses as well as the recommendations will vary because they will relate to the objectives of the assessment.

2.3.1 To assist basin planning organisations

The preparation and information gathering stage is an important part of the assessment for a river basin organisation and will help the agency to build a database of information on hydropower sustainability and understand where the gaps in information are. It will also assist the river basin agency in having discussions about data sharing arrangements and access to information. For each criterion, the assessment team should look at the scoring statements and evidence to identify what would need to be put in place for a river basin organisation to effectively contribute to the management of the different issues associated with that criterion. Scoring is optional.

The assessment should focus on the links between hydropower and other water users and stakeholders in the basin to develop an overall view of sustainable basin development and how hydropower contributes to that. The risk assessment will assist to clarify the role of river basin agencies. The list of actions and recommendations would be a list of what the river basin organisation would need to put in place and how it needs to link to other institutions and stakeholders.

2.3.2 To inform impact assessment studies

For each criterion the assessment team should identify which studies and information would be required to form a Cumulative Impact Assessment (CIA) or Strategic Environmental Assessment (SEA) for the basin to address issues associated with each criterion. Scoring is not required. It could also be used to identify the gaps in existing information and therefore assist to prioritise future studies. The list of actions/recommendations would be a list of what needs to be included in the CIA or SEA as well as any process issues for the implementation of the studies.

2.3.3 To create dialogue between different stakeholders

This application of the tool is very flexible and scoring is optional. The emphasis for assessments conducted primarily to achieve dialogue between different stakeholders should be on allowing each stakeholder to be represented in the discussion and the different views and perspectives to be captured on the topic assessment and scoresheet. The emphasis could be on understanding different perspectives and how the different stakeholders can work collaboratively towards resolving hydropower sustainability issues and establishing effective lines of communication and information sharing.

2.3.4 To monitor hydropower sustainability performance

Scoring must be used if the objective of the assessment is monitoring hydropower sustainability performance. In this case, an independent scoring verification process will be required and the assessment team will need to identify a suitable qualified person to conduct the scoring verification. The assessment must be conducted thoroughly and objectively and there will need to be a strong focus on reviewing the available evidence and interviews against the scoring statements to accurately allocate a score. A justification statement must be provided for every score allocated that explains how hydropower development in the basin meets the requirements of the selected scoring statement based on the evidence and interviews. The risk assessment should still be used as a basis for discussion in the assessment and the scores allocated at the completion of the risk assessment. The "Strength, Weaknesses, Risks and Opportunities" sections of the topic assessment and scoresheet should still be filled in as well as the "Recommended Actions" section.

2.3.5 To assist capacity building or training

Scoring is not necessary when using the tool as a capacity building or training tool. The tool can be used in many ways as a training and capacity building tool. If data and information was available for a basin then it could be used to do an assessment to raise awareness and capacity in hydropower sustainability. Also, if no specific basin data or hydropower developments are available for assessment, the team could still go through the tool and have discussions and make recommendations based on a hypothetical basin. It could be used to identify where skills gaps are and what additional training or information may be needed in an organisation to improve the level of knowledge and skills in hydropower sustainability. In this case, the recommendations might be to list the future training and capacity building needs in an organisation or basin. The "Strengths, Weaknesses, Risks and Opportunities" sections could relate to the strengths, weaknesses, risks and opportunities associated with the current status of knowledge, skills and capacity in an organisation to address

hydropower sustainability issues. For example, in a river basin organisation it may be identified that there is limited knowledge of environmental flows so the risks associated with that could be that studies and data may not be collected in a way that would inform an environmental flows assessment.

2.3.6 To inform the development of standards for hydropower projects

Scoring is required when using the tool to inform the development of standards for hydropower projects. The scoring will assist to identify where standards may be required for hydropower sustainability in a basin or country. The assessment will identify where strengths and weaknesses exist for addressing a range of hydropower sustainability issues. It will also identify whether the different key players and developers and operators are managing issues in a consistent way across the basin. Consistency is a key theme of hydropower sustainability and is very important for issues such as environmental flows, sediment management, benefit sharing and fish passage management. This will identify whether standards need to be developed to address particular issues and ensure consistency across the basin.

The assessment team should focus on whether standards, guidelines and regulations exist as well as focusing on whether there is consistency in management approaches within the basin. It will identify areas of low performance where standards and guidelines may be required. The risk assessment should focus on the need for standards, highlighting areas of inconsistency in management across the basin. The recommendations will focus on the standards and other tools and processes that could be used to raise the level of performance, co-ordination and consistency of hydropower management of sustainability issues.

2.3.7 For prioritising projects/groups of projects

Scoring must be used if the purpose of the assessment is comparing or prioritising different projects of groups of projects. In this case, an independent scoring verification process will be required and the assessment team will need to identify a suitable qualified person to conduct the scoring verification. The assessment must be conducted thoroughly and objectively and there will need to be a strong focus on reviewing the available evidence and interviews against the scoring statements to accurately allocate a score. A justification statement must be provided for every score allocated that explains how hydropower development in the basin meets the requirements of the selected scoring statement based on the evidence and interviews. The assessment should be conducted for each development

scenario and the scores and risks can be compared to determine the most sustainable development scenario.

2.3.8 To assess transboundary arrangements

Scoring is optional when the tool is being used to assess transboundary arrangements. The assessment tool can be used to assess a transboundary basin and identify whether the arrangements for management of sustainability measures between different countries are adequate. It will also enable an assessment of the consistency in policies, regulations, standards and management frameworks in different countries sharing a basin. The assessment team should include representation of all different countries sharing the basin. The assessment team should look at each criterion with a focus on the transboundary aspects of the issue and whether they are effectively and consistently managed. The risk assessment will focus on the implications of different approaches in different countries and recommendations will focus on the processes and agreements that could be put in place to ensure consistency between different countries and the overall improvement of standards in a basin. The dialogue should enable better understandings of the situations in each country and reasons for differences in approaches which will assist in future dialogue.

2.4 Data and information used as evidence for the assessment

The assessment tool is an evidence based assessment. To arrive at a score, evidence must be reviewed that it is adequate to enable a score to be allocated. At the end of each Topic in Appendix A of the Main Document, a list of "Examples of Evidence" is given as a guide only. The assessor/assessment team in consultation with interviewees must record the most suitable evidence to enable scoring for each criterion. In the absence of suitable evidence the assessor must either decline to allocate a score or provide a justification of how a score was derived using other means.

The table below provides a list of the categories of data and information that may be available to be used as evidence to conduct an assessment and the potential sources of information.

Category of information	Source of information
Basin-wide or river data	RBOs or RBCs, national government water resources or other agencies (e.g. fisheries, environmental protection), non-government organisations collecting data and doing studies in the basin, universities or other research organisations, consultants, donors collecting data in the basin.
Hydropower data, information and reports	Hydropower operators and developers, national government agencies responsible for energy and water, consultants assisting with hydropower studies.
National policy, legislation, regulations	National government agencies.
Transboundary information	Regional institutions, national government agencies, RBOs for transboundary basins.

The most efficient way to gather this information is to find institutions or people with knowledge in each of the four categories to help the assessment team find out what is available.

The information gathering stage for the assessment is an important stage of the assessment. Once it is completed, it will form a database of information about the sustainability of hydropower development for the basin that can be built upon and used for many purposes in the future. For this reason, it is important for the data and information to be stored or recorded in a way that it can be used in the future.

Table 3 provides a detailed list of the data and information that may be available to be used as evidence for the assessment and which topics the data and information could be used for. **It is not expected that all information listed below will exist or be available. It is a list of data and information that might exist**. One of the outcomes of the assessment is to identify the gaps in information, data, policies etc. in a river basin. The assessment team should decide how much time to allocate to the information gathering stage based on the resources available and collect as much information as possible within the timeframe. If data or information is not found before the assessment, it may be identified during the assessment from interviewing people or in the follow up stage of the assessment. It is very important to select people to interview who have knowledge of what information will be available for the basin.

Table 3: Checklist of evidence that can be used for the assessment

Examples of evidence	**Topics**	**Available** (yes, no, don't know)
Basin-wide data		
RBO constitution/governance framework	10	
RBO role descriptions, budgets and resourcing	10	
Fish and aquatic environment – habitat, fisheries resources	7	
Biodiversity inventory	2,3	
Ecosystem connectivity data for basin	3,6	
Habitat assessments	3,6	
Unique and irreplaceable biodiversity and cultural heritage sites	3,4,5,6	
Cultural heritage database	2	
Natural resource inventory	1,3	
Hydrological and water quality data	All	
Archaeological and anthropological assessments in basin	2	
Environmental flow studies	6,7	
River morphology, erosion and sedimentation data	3,6	
Land entitlement information	5,8	
Floodplain and fisheries – dynamics and productivity studies	1,6,7	
Nutrient flow data	3,6	
Floodplain studies	3,6	
Basin development option studies	4,5	
Basin environmental flow policy	6	
Basin master plans/development plans	4,5	
Basin IWRM plan	4,5	
River Basin Organisation/Committee – institutional arrangements	10	
Basin scenario assessments	4	
Sector or sub-sector development plans	1,4,5	
SEA studies	All	
Livelihood and poverty assessment surveys	1,2	
Poverty reduction plans – local and regional	1,2	
Regional and national data and reports on social well-being indicators	2	
Basin navigation studies	6	
Basin-wide social and environmental baseline studies	All	
Integrated EPP for the basin	9	
Hydropower data		
Project/multiple project feasibility studies	All	
List of all projects in the basin – existing, proposed, under construction, in feasibility etc.	All	
Hydropower optimisation studies	All	
Operational plans	All	
Construction plans	2,3,6,7	
Clean Development Mechanism (CDM) applications/guidelines, policies	8	
PES agreements	8	
Carbon finance agreements, revenue allocation agreements	8	
Multiple use studies	All	

Examples of evidence	**Topics**	**Available** (yes, no, don't know)
Environmental and social impact assessment studies	All	
Resettlement and compensation plans	2,10,11	
Records of interviews with project affected people	2,10	
Sediment flow studies	3,6,7	
Consent documents – project affected communities	4,11	
Negotiated agreements between project and project affected communities	4,11	
Negotiated benefit sharing agreements with affected groups	8	
Project socio-economic studies	1,2	
Hydropower operational policies and procedures for project or cascade	All	
Livelihood and poverty assessment surveys	1,2	
Project EIA's and management plans	All	
Consultation reports with traditional/indigenous users	2,11	
Operational rules for existing projects	All	
Evidence of Free and Prior Informed Consultation and Good Faith Negotiations	2,11	
Negotiated agreements between project and project affected communities	2,11	
Consultation documentation with other water users	2	
Cumulative impact studies	All	
Hydropower project siting and design studies	All	
SEA studies	All	
Dam Safety Management System (DSMS) documentation	9	
Dam safety risk assessment reports	9	
Integrated DSMS documentation for group of projects	9	
Independent auditing and monitoring reports	9	
Dam break analysis reports for projects in a cascade	9	
Emergency Preparation/Response Plan	9	
Compliance reports	10	
Monitoring reports	10	
Stakeholder identification reports/databases	2,11	
Evidence of support – absence of opposition	11	
Publicly available stakeholder information	2,11	

National government agencies		
Energy services option studies	4	
List of national policy, legislation and regulations		
• Hydropower impact assessment	All	
• Environmental protection	3	
• Cultural heritage protection	2	
• Regulations and policies for hydropower options assessment		
• Policies and agreements for the protection of cultural resources		
• Water resources management	All	
• Indigenous peoples	2	
• Social/human rights protection	2	
• Environmental flows policy	6	
• Navigation regulations	6	
• Fisheries protection	7	
• Environmental management plan requirements	3	
• Environmental pollution	3	
• Natural resources plans	3	
• Involuntary re-settlement	2	
• Electricity supply	4,5	
• Export and trade – electricity	4,5	
• Benefit sharing	8	
• Dam safety	9	
• Public consultation	11	
• Hydropower agreement documents (e.g. MOUs, PPAs)	10	
• Capacity building plans	10	
• Notification and conflict resolution	10	
• Water allocation plans	All	
• National and regional emergency flood management plans and policies	10	
• National policy frameworks and development targets (for relevant sectors)	4,10	
• Electricity supply options assessments	4	
Transboundary/Regional information		
Regional development plans	4	
Regional water and energy services options studies	4	
Transboundary EIA	All	
Regional energy development plans	4	
Trade requirements	10	
National and regional flood and drought management plans	6,10	
Transboundary benefit sharing agreements	8,10	
Agreements – data sharing, notification	10	
Regional/basin agreements	4,5	
Notification and conflict resolution	10	
Transboundary and regional agreements for basin or water resource management	4	
Regional economic integration plans	4	

2.5 Interview schedule for assessment

In this section the assessment team should record which key people have been identified for interview to provide information for the assessment. People from the four assessment categories should be selected to ensure all topics and criteria are adequately covered. The selection of interviewees is an important aspect of the assessment and people should be selected who have knowledge of what data and information are available for the basin. The table below should be completed as a record of who was interviewed for the assessment.

Person to be interviewed	**Position and organisation**	**Date of interview scheduled**	**Person to conduct interview**
Basin-wide information, data and reports			
National government policies, regulations, legislations, plans and reports			
Transboundary agreements, policies and mechanisms			
Hydropower data, information, reports, studies, projects			

3. Other considerations

3.1 Assessing projects at different stages of development

The assessment tool is designed to assess a basin which may have multiple projects, all at different stages of development (options assessment, project siting and design, preparation, construction and operation). The scoring statements have been designed to cater for projects at all different stages. For projects that are in the options assessment or feasibility stage, the scoring statement will ask for evidence that requirements for a particular sustainability criterion "will" happen. Many of the requirements relate to the basin planning and regulatory framework, which can still be assessed in the absence of any existing development in the basin. The example scoring statement (Involuntary re-settlement) and following discussion illustrate this point.

Involuntary re-settlement 3 scoring statement

3 – Policies and regulations are in place in the basin that address involuntary re-settlement requirements, including the avoidance of re-settlement. Hydropower development has/will prioritise the avoidance and minimisation of population displacement in its options, siting and design studies. Re-settlement and livelihood restoration programs are/will be implemented and monitored appropriate to the stage of development.

The assessment team needs to demonstrate that all of the necessary requirements are in place in the basin for that requirement to occur for future projects and/or find evidence that existing projects in that basin are/have been successful in implementing those requirements.

It is therefore the likelihood that those requirements will be met for future projects based on what is in place in the basin for hydropower development and what other projects in the basin have achieved in their implementation. The likelihood may be based on evidence that such plans and programs have been implemented and the regulatory framework is effective in delivering the intended outcomes for other projects in the basin.

For pristine basins where no previous development has occurred, the likelihood would be based on the adequacy of the regulatory and basin planning setting and evidence of its effectiveness in implementing policy and regulatory requirements. It may also be based on the past performance of developers that may have projects in other basins.

3.2 Continuous improvement and how to assess different levels of performance in the same basin

In some basins to be assessed there will be existing projects that have been developed in the past and some of these projects may perform poorly against sustainability criteria. So, how

should a basin be scored when it comprises projects of the past that may represent poor practice by today's standards as well as modern projects that could represent best practice in sustainable development? From an assessment perspective, it is evidence of continuous improvement that is being sought as well as evidence that lessons from the past have been learned and that they are being incorporated into modern day decision making processes and implementation.

To address this issue for the purpose of the assessment, a separate continuous improvement scoring statement has been developed. The continuous improvement scoring statement enables an assessment of whether the lessons from past poor practice have been learned and are being incorporated into modern basin planning and hydropower development. It can be used for any criterion as required to determine whether continuous improvement is being achieved for that criterion if there is evidence of past poor practice. If a basin can demonstrate continuous improvement from past poor practice, then the basin can achieve a score of 3 for that criterion even if it includes past or existing poor performing projects. To do this, the following needs to be demonstrated using objective evidence;

i. Lessons from unsustainable practices in the past have been learned and are being incorporated into decision making and regulatory frameworks for new projects by government and industry; (Examples of evidence: new policies, legislation, transboundary or other agreements or management plans that have been put in place in response to poor practices in the past);

ii. The current operation and maintenance of poorly performing existing projects is taking significant steps to improve the sustainability of that project; (Examples of evidence: i) hydropower developers and operators have implemented improved practices to address poor performance of the past ii) changes to development agreements and regulations for existing projects); and

iii. The extent of the impact from the poorly performing project(s) is not significant in a whole of sub-basin context for that criterion or is significantly improving over time. (Examples of evidence: monitoring data and independent reports showing the extent of the impact on the basin from poorly performing operations is not significant or is significantly improving over time and will continue to improve).

4. Conducting the assessment

This section contains all of the forms that need to be filled out during the assessment. The following forms are included in this section:

1. The Assessment Information Sheet
2. The Topic Assessment and Scoresheets for Topics 1 to 11
3. The Evidence and Interviewee list
4. The Assessment Report Template

The forms in this section must be completed during the assessment. They are available as individual forms electronically.

4.1 Instructions on how to complete a topic assessment using the Topic Assessment and Scoresheet

To fill in the Topic Assessment and Scoresheet, the assessment team starts with the first criterion of the topic and works its way through to the final criterion for the topic. The team should read the **quick guide** on how to read scoring statements before the beginning of Topic 1.

For each criterion, there are 5 scoring statements (1-5) and there will be evidence and interviews to provide information for each criterion. The score must be derived by selecting which scoring statement most accurately reflects the situation in the basin for that criterion using the available evidence. If there is insufficient evidence, the team may decline to allocate a score. If this is the case, a comment should be added to the topic assessment and scoresheet.

For each criterion, the team refers to the scoring statements **(reading the 3 statement first)** and the evidence that is relevant to that criterion. Before allocating a score, the assessment team will conduct the risk assessment, filling in strengths, weaknesses, risks and opportunities for the basin for each criterion. Based on the risk assessment, the team will then fill in some recommended actions for each criterion. Once this is completed the team will then determine which score should be allocated to each criterion (if scoring is to be used). The justification statement must then be added and should refer to the evidence used to determine that the basin meets the requirements of the selected scoring statement.

Once the above is completed for each criterion in the topic, the team must provide a summary of the status of the basin and the high priority risks, opportunities and recommended actions for the basin. This section will then be added to the Assessment Summary Report for that topic.

A scoring verification process will be required for assessments that include scoring. A suitable qualified independent verification person should be identified prior to the commencement of the assessment. The verification person will need to check the scoring justification statements and the evidence used to derive the score for each criterion.

4.2 Scoring statements

The sections above have explained the use of scoring in the assessment tool. The table below provides a general guide as to the types of characteristics that may be present for each score. It is a general guide only; scoring statements provide the detailed descriptions for each criterion. The table below however can be used as a reference when considering the level of performance in the basin.

Table 4: General characteristics of scoring statements 1 to 5

Score	Characteristics that may be evident
5 Excellent/ best practice	• Regulatory framework represents current best practice • Very high level of integration between basin planning and hydropower planning • Very high level of balance between economic, social and environmental values • Long term funding for sustainability measures in place • Very high level of stakeholder engagement and involvement in decision making • Ongoing monitoring review and continuous improvement process, including research and incorporation of lessons learned • Very high level of community support for decisions made • Excellent assessments – rigorous and integrated
4 Very good/ beyond minimum standards	• Regulatory framework includes enforceable agreements • Negotiated agreements in place • High level of integration between basin planning and hydropower planning • High level of balance between economic, social and environmental values • Ongoing monitoring review and continuous improvement process • Long term funding to manage most key aspects • High level of community support for decisions made • Very good comprehensive assessments
3 Good/ Acceptable/ Reaching minimum standards	• Regulatory framework adequate and effective • Basin planning and project planning processes integrated • Implementation of management plans and programs evident • Reasonable degree of balance between economic, social and environmental values • Ongoing monitoring review and continuous improvement process, some gaps exist • Funding to manage most key aspects • Meaningful stakeholder engagement • Good community support for decisions, some minor opposition • Good assessment with minor or insignificant gaps
2 Poor/below minimum standards	• Regulatory framework inadequate or ineffective • Limited integration between project and basin planning • Social and environmental issues not adequately represented in planning • Limited funding • Limited monitoring and review; no continuous improvement • Poor stakeholder engagement • Inadequate assessments; significant gaps • Poor community support
1 Very poor/no attempt to reach minimum standards	• Poor management not reacting to issues • No integration between basin planning and hydropower projects • Narrow perspective on technical aspects • Insufficient funding • No meaningful monitoring or review • No stakeholder engagement • Very poor quality assessments • Significant opposition to projects

4.3 Assessment Information Sheet

The assessment team will use the assessment preparation checklists to plan the scope and objectives of the assessment. The Assessment Information Sheet (below) must be completed at the commencement of the assessment as a record of the assessment.

Assessment Title:		
Description of assessment: (what is being assessed – scale, projects, basin etc.)		
Purpose of assessment: (e.g. compare sub-basins, facilitate dialogue between stakeholders etc.)		
Expected outcomes:		
Assessment leader:		
Authorisation (if required):		
Details of assessment team: (nominate person to be assessment leader)		
Name	Organisation and position	Signature (on completion of assessment)
Date and location of assessment:		
List of participants: (interviewees, hosts, facilitators etc)		
Name	Organisation and position	Role in assessment
Responsibility for reporting and follow-up:		
Comments:		

4.4 Topic assessment and scoresheets

The Topic Assessment and Scoresheets are the key forms to be filled out by the assessment team during the assessment. One form must be completed for each topic. For each topic a summary section must also be included in the Assessment Summary Report Template.

Topic Assessment and Scoresheet

Topic :	
Strengths	Weaknesses
Opportunities	Risks

Recommended actions (add extra rows if required)	Responsibility (Which group would be responsible for this action if it was approved – hydropower operators, government agency, RBO etc.)
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	

Scoring justification: For each criterion provide a brief statement to justify the score allocated that refers to scoring statements and evidence supporting score.		
Criterion	Score	Justification
1.1		
1.2		
1.3		
1.4		
1.5		
1.6		

Topic summary section for Assessment Summary Report	
Status (summary of key strengths and weaknesses)	
Priority risks and opportunities	
Priority actions	
Comments:	
Linkages to other initiatives/projects/tools in the basin:	

Scoring results:						
Criterion:						
Score:						

Was score independently verified? **YES** **NO**
If yes, provide details of verification:

4.4.1 Evidence list

Topic/ Criterion	Evidence used (technical reports, databases, policies, plans, agreements, regulations etc.)	Comments

5. Assessment report

The assessment report should include the following sections as a minimum:

1. Executive summary (providing an overview of the assessment findings)
2. Completed Topic Assessment Information Sheets
3. Completed Assessment Summary Tables for each topic (below)
4. Discussion on assessment follow up actions
5. Appendices
    a) Topic assessment and scoresheet for each topic
    b) Interview list
    c) Evidence list
    d) Evidence of scoring verification if scoring used

5.1 Assessment summary tables

Once the Topic Assessment and Scoresheet is completed, the summary section from each topic assessment and scoresheet must be compiled and presented in the Assessment Summary Report as shown below:

Assessment Summary Tables for each topic compiled for Assessment Summary Report

Topic 1: Options assessment and alignment with regional and international agreements, policies and plans						
Status (summary of key strengths and weaknesses)						
Priority risks and opportunities						
Priority actions						
Scoring results:						
Criterion:	1.1	1.2	1.3			
Score:						
Was score independently verified? **YES** **NO**						
Topic 2: Site selection, optimisation and multiple project co-ordination						
The assessment team in this section must summarise the key findings for this topic and the priority risks, opportunities and actions.						
Status (summary of key strengths and weaknesses)						
Priority risks and opportunities						
Priority actions						
Scoring results:						
Criterion:	2.1	2.2	2.3	2.4		
Score:						
Was score independently verified? **YES** **NO**						
Topic 3: Hydropower and economic development in the basin/sub-basin						
Status (summary of key strengths and weaknesses)						

Priority risks and opportunities	
Priority actions	

Scoring results:						
Criterion:	3.1	3.2	3.3			
Score:						
Was score independently verified? **YES** **NO**						

Topic 4: Hydropower and social and cultural well-being in the basin/sub-basin	
Status (summary of key strengths and weaknesses)	
Priority risks and opportunities	
Priority actions	

Scoring results:						
Criterion:	4.1	4.2	4.3	4.4	4.5	
Score:						
Was score independently verified? **YES** **NO**						

Topic 5: Hydropower and environmental quality and natural resources management in the basin/sub-basin	
Status (summary of key strengths and weaknesses)	
Priority risks and opportunities	
Priority actions	

Scoring results:

Criteria:	5.1	5.2	5.3	5.4	5.5	5.6
Score:						
Was score independently verified? **YES** **NO**						

Topic 6: Environmental Flows and downstream regulation

Status (summary of key strengths and weaknesses)	
Priority risks and opportunities	
Priority actions	

Scoring results:

Criterion:	6.1	6.2	6.3	6.4	6.5	6.6
Score:						
Was score independently verified? **YES** **NO**						

Topic 7: Fish passage and fisheries management

Status (summary of key strengths and weaknesses)	
Priority risks and opportunities	
Priority actions	

Scoring results:

Criteria:	7.1	7.2	7.3	7.4		
Score:						
Was score independently verified? **YES** **NO**						

Topic 8: Sharing of benefits and use of innovative financing measures for sustainability (local and transboundary)

Status (summary of key strengths and weaknesses)	

Priority risks and opportunities	
Priority actions	

Scoring results:						
Criterion:	8.1	8.2	8.3	8.4	8.5	
Score:						

Was score independently verified? **YES** **NO**
If yes, provide details of verification:

Topic 9: Provision for safety and disaster prevention and management	
Status (summary of key strengths and weaknesses)	
Priority risks and opportunities	
Priority actions	

Scoring results:						
Criterion:	9.1	9.2	9.3	9.4	9.5	
Score:						

Was score independently verified? **YES** **NO**

Topic 10: National and basin-wide institutional setting	
Status (summary of key strengths and weaknesses)	
Priority risks and opportunities	
Priority actions	

Scoring results:						
Criterion:	10.1	10.2	10.3	10.4	10.5	10.6
Score:						
Was score independently verified? **YES** **NO**						
Topic 11: Communication, basin stakeholder and community involvement and support for hydropower development						
Status (summary of key strengths and weaknesses)						
Priority risks and opportunities						
Priority actions						
Scoring results:						
Criterion:	11.1	11.2	11.3	11.4	11.5	
Score:						
Was score independently verified? **YES** **NO**						

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