



RSAT
Rapid Basin-wide Hydropower
Sustainability Assessment Tool

Rapid Basin-wide Hydropower Sustainability Assessment Tool

2016 EDITION

Joint Initiative



Acknowledgments

The RSAT 2016 Edition is the result of feedback received from participants of the overview training session and the trial assessments in the four MRC Member Countries between 2011 and 2015. The Mekong River Commission would like to acknowledge the guidance, support and valuable contributions received from the four National Mekong Committees and line agencies, and members of broader civil society who participated in the RSAT training sessions and trial assessments. Special thanks to the Government of Germany for its support through MRC-GIZ cooperation.

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Further information on the MRC Initiative on Sustainable Hydropower (ISH) can be found on the MRC website: <http://www.mrcmekong.org/ish/ish.htm>.

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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
CA	Concession Agreement
CIA	Cumulative Impact Assessment
DSMS	Dam Safety Management System
ECSHD	Environmental Considerations for Sustainable Hydropower Development
EFA	Environmental Flow Assessment
ESIA	Environmental and Social Impact Assessment
EPP	Emergency Preparedness Plan
IPP	Independent Power Producer
IWRM	Integrated Water Resource Management
MOU	Memorandum of Understanding
MRC	Mekong River Commission
NGO	Non- Government Organisation
PES	Payment for Ecological Services
PDA	Power Development Agreement
PDP	Power Development Plan
PPA	Power Purchase Agreement
RBO	River Basin Organization
RBC	River Basin Committee
RSAT	Rapid Basin-wide Hydropower Sustainability Assessment Tool
SEA	Strategic Environmental Assessment
SDG	Sustainable Development Goals
SIA	Social Impact Assessment
SWOT	Strengths, Weaknesses, Opportunities and Threats
TNC	The Nature Conservancy
WCD	World Commission on Dams
WWF	World Wide Fund for Nature
UNFCCC	United Nations Framework Convention on Climate Change
UNWC	United Nations Watercourses Convention



Preface

The Environmental Considerations for Sustainable Hydropower Development (ECSHD) was an initiative established in 2006 to develop tools that will support planning and decision - making for sustainable hydropower development in the Mekong River Basin. The ECSHD was a result of cooperation between the Asian Development Bank (ADB), the Mekong River Commission (MRC) and the World Wide Fund for Nature (WWF).

The Rapid Basin-wide Hydropower Sustainability Assessment Tool (RSAT) was first developed as part of the ECSHD in order to assess hydropower sustainability within an IWRM based framework. Piloting early drafts of the RSAT in the Mekong region was conducted in 2010 and 2011 and version 4 was developed in 2012. The MRC's Initiative for Sustainable Hydropower continued a program of implementation of the RSAT from 2012-2015 in the Mekong region. WWF carried out a parallel series of RSAT training and awareness workshops for NGOs and CSOs in Vietnam, Cambodia and Myanmar between 2012 and 2015.

The RSAT has been significantly shaped by the regional experience and expertise of the pilot participants and the feedback they provided on versions 3 and 4 of the tool. These completed RSAT documents draw upon these experiences and provide examples of how RSAT can be used in a variety of settings.

The RSAT provides a framework and methods to apply IWRM principles to sustainable hydropower development. Application of the tool is intended to support the lower Mekong governments to achieve their strategic priorities relating to IWRM and sustainable hydropower development as identified in the Mekong IWRM Based Basin Development Strategy 2011. See <http://www.mrcmekong.org/assets/Publications/strategies-workprog/BDP-Strategic-Plan-2011.pdf>.

Although the RSAT has its origins in the Mekong region it can be adapted for use in any region of the world. The RSAT is available as an open source tool with no restrictions on its use and it is hoped that stakeholders from other regions will also use the RSAT to advance sustainable hydropower development in their respective regions.



Evolution of the RSAT document

The origins of RSAT lie in the recommendations from the study commissioned by MRC, ADB and WWF in 2006, entitled 'Environmental Considerations for Hydropower Development in the Mekong Region' by Peter King, Jeremy Bird and Lawrence Haas. That report recommended that the IHA Sustainability Guidelines (later the Hydropower Sustainability Assessment Protocol) be used as a starting point for developing sustainability criteria for the GMS. During the ADB - sponsored 3S Rivers IWRM project, the IHA HSAP was trialed for application on the hydropower developments on the Sekong, Sesan and Sre Pok rivers. At the final workshop of this project in Buon Ma Thuot, in the Central Highlands of Vietnam in mid-2009, one section of the HSAP was trialed for application in the basin context. It was then considered that since the HSAP was more focused on a single hydropower plant, it was less appropriate for basin-wide application. As a result, a specific tool for considering basin-wide application was needed. Mr. Voradeth Phonekeo, the Coordinator of the MRC's Initiative on Sustainable Hydropower, has guided the development of the RSAT from this beginning through to this 2016 edition. He was supported successively by technical advice from Mr. Larry Haas, Mr. Simon Krohn and Ms. Praivan Limbanboon. Hydro-Tasmania were contracted by MRC during 2009 – 2010 to develop such a tool, and the RSAT Version 2 was prepared and trialed by the MRC at a two-day workshop in July 2010. Ms. Donna Brown was the principal architect of the RSAT and she was then contracted by MRC to develop the

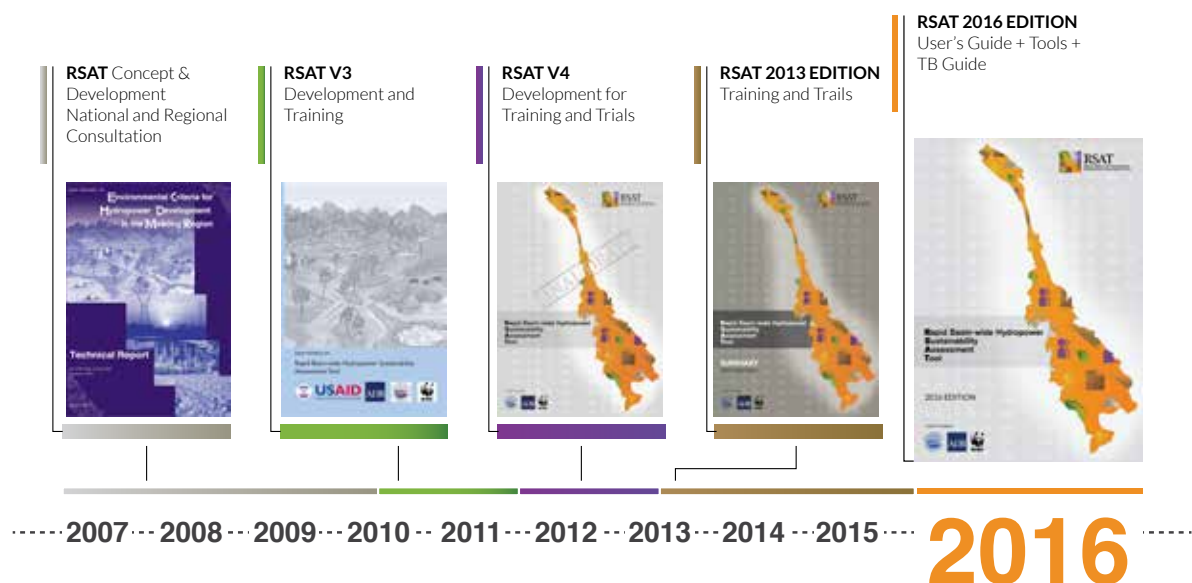
tool further. During 2011 and 2012, a series of initial workshops in each of the MRC Member Countries was held to promote RSAT Version 3, and then a series of pilots was organised in specific river basins of Mekong tributaries. The publication of version 3 and its promotion was also supported by funds from USAID. These pilot trials included:

RSAT Version 3 trials under the MRC with government stakeholders in the following Basins:

- Lower Sre Pok Basin, Cambodia, April-May 2011
- Upper Sre Pok Basin, Vietnam, June 2011
- Nam Kam Basin, Thailand, May-June 2011

Out of this experience, RSAT Version 4 was developed with some refinement of the topics and processes. The scoring of the performance of the river basin against the performance standards was also dropped since it was found that this led to some confusion in the process. RSAT Version 4 pilot dialogues were conducted as follows:

- Upper Sre Pok Basin, Vietnam, June 2013
- The Lower Sre Pok, Cambodia, in June and October 2013
- Nam Theun Nam Kading Basin, March 2015
- Ubol Ratana Dam, Thailand, August 2015
- Pursat Basin, Cambodia, July 2015
- Upper Sesan Basin, Vietnam, November 2015



These dialogues were organised through MRC and essentially involved government and non-government stakeholders from national and provincial levels.

GIZ has played an important supporting role throughout this process while WWF Greater Mekong, with assistance from Oxfam, organised a series of workshops to raise awareness and train CSO and NGO participants in the application of RSAT in Cambodia, Viet Nam and Myanmar, with facilitation provided by Peter-John Meynell and Donna Brown.

In December 2015, the MRCS/ISH together with WWF, GIZ, and RSAT International consultants gathered to review the different experiences accumulated during the past years and to discuss the possibility of adding a User's Guide and a set of tools to help the assessment process as well as to prepare a Draft guide for

Transboundary Dialogue with the use of RSAT. These additional documents (guides and tools) were all added to the RSAT Version 4 document to form the "RSAT 2016 EDITION".

In September 2016, a consultation meeting was arranged for the four NMCS where the RSAT 2016 EDITION was presented and discussed. One of the most remarkable outcomes was that the NMCS agreed to conduct a first transboundary RSAT dialogue between Cambodia and Vietnam for the Sre Pok River Basin. The event was planned to take place in December 2016. It was also reported that during September 2016, the first training course of three training modules for RSAT facilitators (nationals from the six Mekong countries) was held in Thakhek in Lao PDR.



PART 1: RSAT OVERVIEW





Introduction

The RSAT is a multi-stakeholder dialogue and assessment tool designed for a rapid and integrative assessment of hydropower development and management issues at a basin-wide level. Hydropower sub-basins often host multiple projects that are at different stages of development. Placing hydropower in a basin-wide context requires reviewers to look beyond individual projects and to take a broader integrated approach to planning and management, following the principles of IWRM. In any hydropower sub-basin there are a number of stakeholder groups with various roles, responsibilities and interests. Sustainable hydropower and water resource development depends on the capacity and performance of each of these key stakeholder groups and their level of collaboration and interaction with each other. The RSAT is designed to support collaborative and integrative planning and decision-making processes, and dialogue amongst key stakeholder groups.

There are international conventions and agreements for transboundary river basin management (e.g. 1995 Mekong Agreement) and globally accepted principles for IWRM. In the past decade, there have been a number of performance standards and assessment tools developed for hydropower sustainability. The RSAT content brings together accepted good

practice principles for sustainable hydropower development, river basin management and IWRM into one integrated tool that is tailored to the Lower Mekong hydropower development context.

The RSAT has been developed in response to needs identified in the Mekong region, which is currently experiencing rapid and large-scale hydropower development where sub-basins often have multiple projects at different stages of development. In an RSAT assessment and dialogue process, a sub-basin with hydropower development is assessed against a set of topics and criteria using the secondary data and information available. Focus is therefore placed not on individual hydropower projects but on the broader context of energy sector and water resource planning and management at sub-basin, national and transboundary levels. The RSAT is designed to complement and not replace existing tools, such as ESIA and SEA tools; for example, RSAT can provide a structured format for issue-based stakeholder participation in these impact assessments.

RSAT Principles

The RSAT is underpinned by key sustainability themes and principles which are described below.

IWRM AND ITS RELATION TO SUB-SECTORS





Who are the key stakeholder groups for hydropower development and IWRM?

The key stakeholder groups for hydropower development and IWRM that can benefit from the use of the RSAT are:

- National government ministries, agencies and regulatory authorities from the energy and water sectors and other relevant sectors
- Government power utilities
- Hydropower developers and operators and their consultants – private and public sector
- Provincial and local government agencies and administrative bodies across different sectors
- River basin organisations
- Representatives of affected communities, resource user groups and broader basin populations
- Transboundary and regional institutions
- NGO's and research institutions
- Investors and funding organisations

Cooperation in international river basins

The RSAT has its origins in the Mekong region and is therefore focused on the sustainable development needs of an international river basin. The RSAT includes considerations of transboundary and sub-national cooperation for river basin and hydropower planning and management. International cooperation for river basin management and infrastructure development is a challenging and long-term process that requires a diversity of mechanisms for communication, notification, and negotiation to achieve optimal development outcomes.

Integrating river basin planning and hydropower regulatory and management frameworks

Sustainable hydropower development requires a high level of integration between water resource and energy sector planning and the hydropower regulatory and management frameworks. Water resource management and hydropower development are often the responsibility of separate government agencies. Communication, joint planning, coordination and data sharing mechanisms are required between these agencies to ensure that hydropower development occurs within an IWRM framework.

Ensuring robust governance for sustainable development at all levels

Sustainable hydropower development requires a transparent and accountable system of governance applied at all levels from local to international. Governance includes regulatory frameworks, national policies, plans, laws and the various institutions with roles and responsibility for water and energy planning and management at different levels. Regulatory frameworks, policies and plans must be supported by institutions with adequate



capacity and effective implementation and enforcement mechanisms, including conflict resolution mechanisms. A key theme in the RSAT is the importance of multiple levels of governance from local to international, and how those levels interact with each other.

Collecting baseline data to inform decisions and measure change

River basins that host one or more hydropower projects experience a number of alterations and pressures on natural and social systems in addition to pre-existing pressures. The collection of basin-wide baseline data to inform planning and decision-making and to enable the measurement of change enables an evidence-based approach to managing risk and optimising development outcomes. Note that primary data will not be collected, but during the RSAT process baseline data collected by relevant institutions in the basin would be reviewed and gaps identified.

Using collaborative and multi-disciplinary approaches to options assessment and hydropower siting and design

Options assessment studies and siting and design processes require multi-disciplinary, transparent and consultative approaches to optimise development outcomes at the sub-basin level and identify and manage risks. In sub-basins where there are multiple hydropower projects or private sector developers, government has an important role to play in the optimisation of development options for new and existing project sites.

Engaging stakeholders and protecting rights and entitlements

Stakeholders affected by and hosting hydropower development, should have access to planning and decision-making processes.

Some examples include representative committees, disclosure of information and participatory planning processes. Hydropower planning and decision-making should maximise opportunities to benefit society and address social risks to ensure that no-one in the basin is worse off as a result of hydropower development.

Equitably sharing the benefits and costs of development

Development of electricity infrastructure is intended to benefit broader society and improve the quality of life of basin residents through the provision of electricity and/or revenue generation in the case of export projects. The intention of benefit sharing is to ensure equitable resource use by distributing the costs and benefits of hydropower equitably to river basin residents and across the economy to contribute to broad-based growth and to support social equity policies. Communities and natural systems in a hydropower sub-basin that bear the negative impacts of hydropower development should be amongst the first, not the last to receive the benefits.

Addressing poverty and food security in hydropower basins

Poverty alleviation and food security are explicit objectives of economic growth and development; of equal importance to water and energy security. They should therefore be prioritized in hydropower and water resource development planning. Hydropower projects can contribute to improved food security and poverty alleviation through the provision of improved water and energy services and economic spin offs from development. Conversely, hydropower development has the potential to exacerbate poverty and have a negative impact on food security if risks are not carefully identified and managed.



Maintaining basin-wide ecosystem integrity

Hydropower projects can significantly alter ecosystems from their pre-existing state, and careful scientific assessment of impacts and use of avoidance, mitigation and off-set measures is required to maintain the integrity of ecosystems in the sub-basin for the benefit of current and future basin populations. The maintenance of biodiversity and ecosystem connectivity at a basin level is therefore an integral part of hydropower planning and decision-making.

Open access and variety of uses

The RSAT is designed as an open access tool that can be used by any organisation, and adapted to the specific application. There are no restrictions or permissions required for its use, though an acknowledgement to the original designers is appreciated. Some of the different applications are described in Section 3.





RSAT Topics and criteria

The RSAT consists of a framework of 10 topics and 27 sub-topics (see Table 1) which are described in detail in Part 2. The topics have been selected as a result of research since 2006 and reflect the core sustainability principles of the RSAT. The development of RSAT content has included research into hydropower sustainability and IWRM, various safeguards and international standards as well as the inputs of various stakeholders that have contributed to the development and trialling of the tool in the Mekong region.

Each sub-topic consists of four criteria, or perspectives, as listed below. The intention of the four criteria is to provide a framework of analysis for each topic from the perspective of four key areas of responsibility relevant to hydropower development and IWRM. A description of the four RSAT criteria is given below:

Four RSAT criteria

A. River Basin Planning and Management

– focuses on the IWRM-based principles and practices in river basin planning and management across sectors and the collection of basin-wide baseline data to inform planning and decision-making and monitor change.

B. Energy / Power Sector Planning and Regulation – focuses on power sector planning and regulation, emphasizing hydropower planning and management. This criterion also focuses on the integration between power planning and water resource planning.

C. Hydropower Projects – focuses on the combined plans, studies and management actions of all hydropower developers and operators in the basin at all stages of the project cycle (project identification, selection, planning, design, construction and operation). This criterion also provides a focus on how different projects coordinate with each other and other water-users in the basin.

D. Regulatory and Governance – focuses on the regulatory and planning frameworks for hydropower development and water resource management at different levels from local to international and how they are enforced and implemented in practice.

Performance statements

Each criterion consists of two or three qualitative performance statements that describe the various aspects of sustainable hydropower development and IWRM relevant to the sub-topic. Evidence is assessed against performance statements. An example is given below for sub-topic 7.1, Criterion C. Hydropower projects.

7 Flows and Reservoir management

7.1 Multiple water-use optimisation and efficiency

C. Hydropower projects –

Hydropower feasibility studies are consultative and seek to enhance design and operational opportunities for multiple-use where feasible. Hydropower projects coordinate with other agencies and water-users in the operations stage to achieve agreed multiple-use objectives.

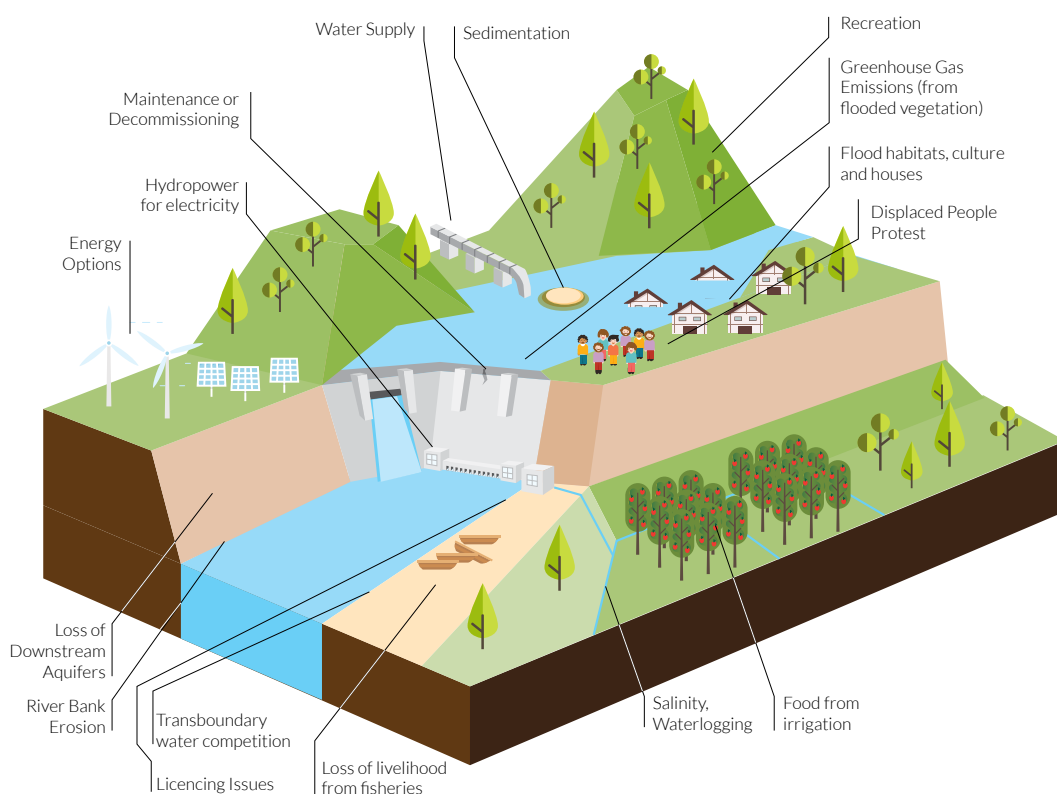
**TABLE 1: SUMMARY OF RSAT TOPICS AND SUB-TOPICS**

THESE ARE DESCRIBED IN DETAIL IN PART 2: RSAT TOPICS

TOPIC 1 Institutional capacity	
1.1	Transboundary institutional capacity
1.2	National to local institutional capacity
1.3	Water and energy sector integrated planning
TOPIC 2 Options assessment, siting and design	
2.1	Demonstrated need and options assessment
2.2	Siting and design for basin-wide sustainable development
TOPIC 3 Economic contribution of hydropower	
3.1	National economic and financial analysis
3.2	Transboundary economic analysis
TOPIC 4 Equitable sharing of hydropower costs and benefits	
4.1	Transboundary benefit sharing
4.2	National to local benefit sharing
4.3	Financing ecosystem protection and other measures
TOPIC 5 Social issues and stakeholder consultation	
5.1	Stakeholder identification and consultation
5.2	Assessment and management of basin-wide social impacts
5.3	Food security and poverty alleviation
5.4	Indigenous peoples and ethnic minorities
TOPIC 6 Environmental management and ecosystem integrity	
6.1	Assessment and management of basin-wide environmental impacts
6.2	Biodiversity conservation and ecosystem integrity
TOPIC 7 Flows and reservoir management	
7.1	Multiple water-use optimisation and efficiency
7.2	Reservoir planning and management
7.3	Coordinated hydropower operations
7.4	Downstream and environmental flows
7.5	Flood and drought management
TOPIC 8 Erosion, sediment transport and geomorphological impacts	
8.1	Sediment baseline and impact assessment
8.2	Management of impacts and sediment resources
TOPIC 9 Management of fisheries resources	
9.1	Fisheries baseline and impact assessment
9.2	Management of impacts and fisheries resources
TOPIC 10 Dam and community safety	
10.1	Dam safety
10.2	Community safety and emergency response

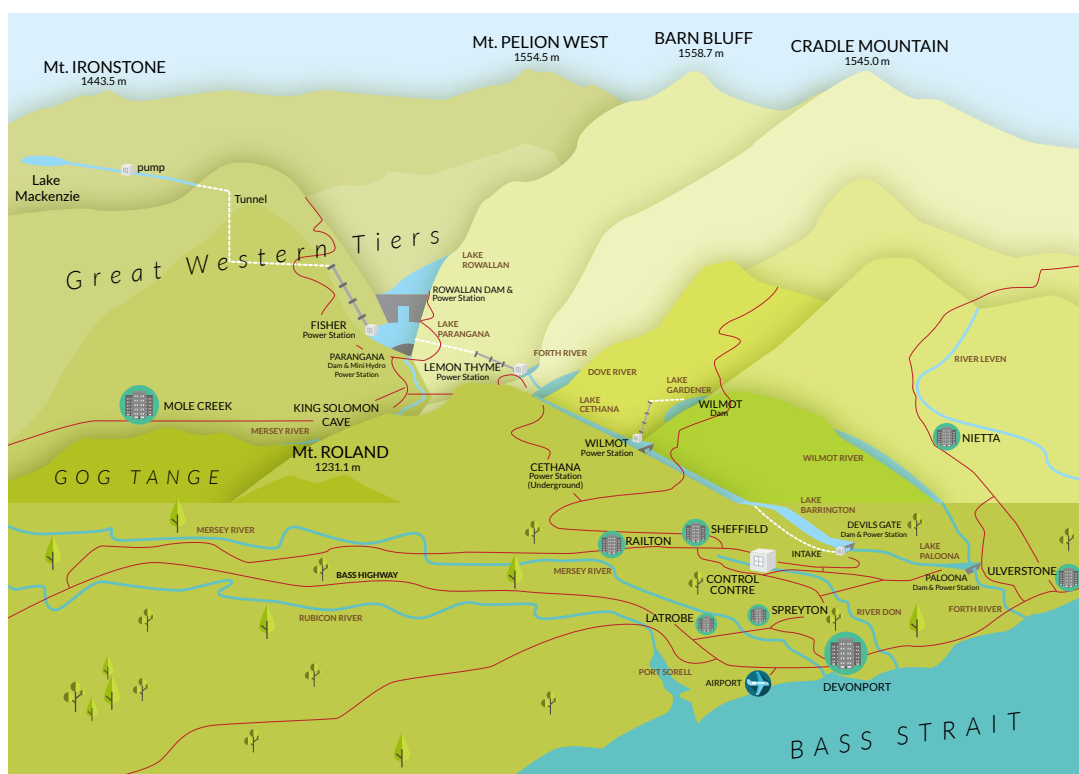


FIGURE 1: THE RSAT TOPICS COVER ALL THE MAJOR SUSTAINABILITY ISSUES OF HYDROPOWER



SOURCE: WWW.DAMS.ORG

FIGURE 2: THE RSAT TRIES TO ADDRESS COMPLEX BASIN-WIDE ISSUES OF SUSTAINABILITY, ALLOWING CONSIDERATION OF DIFFERENT TYPES OF HYDROPOWER SCHEME IN A BASIN





Why conduct an RSAT assessment?

The RSAT is a flexible tool that can be used to meet a number of different needs and objectives in a sub-basin with proposed or existing hydropower development or a mix of both. An RSAT assessment will help to identify gaps, risks and the key institutional responses and management strategies that can be adopted for sustainable development of hydropower in a basin or sub-basin.

An RSAT assessment can be conducted within organisations or as a multi-stakeholder assessment process that brings together groups with key responsibilities and interests in the sub-basin (e.g. developers, government agencies, river basin organisations). The objectives of the assessment will vary, depending on the development context, and will be identified during the assessment, establishment, and preparation stage. Examples of objectives for RSAT assessments are listed below:

Examples of RSAT assessment objectives:

- To identify gaps in data, regulatory frameworks, institutions and on-the-ground practices
- To identify the development risks, opportunities and priority issues in the basin within a structured framework

- To inform the scope of cumulative and strategic impact assessment studies
- To inform studies to optimise development outcomes in a sub-basin
- To assist river basin organisations to engage in the hydropower planning and management process and develop action plans based on identified priorities
- To assist water and energy planners to identify needs and opportunities for collaboration and coordination
- To inform the development of a watershed management strategy in a hydropower sub-basin
- To monitor hydropower sustainability performance in a sub-basin
- To establish dialogue and collaboration between different hydropower and river basin stakeholders
- To conduct capacity building or training in hydropower sustainability or IWRM
- To assess transboundary arrangements for hydropower development



Figure 3: Benefits of RSAT use for different stakeholder groups





The RSAT assessment process

The RSAT includes a range of assessment methods to enable a flexible approach depending on the assessment objectives and the needs and capacity of the institutions involved in the assessment. The RSAT assessment methods are designed primarily for group work and are suitable for participants with both technical and non-technical backgrounds. When a multi-stakeholder group is conducting the assessment a facilitator will help to support the multi-stakeholder dialogue process.

RSAT Assessment methods

The RSAT Toolbox (Part 5) provides guidance on the RSAT assessment methods. It is hoped that over time groups using the RSAT will continue to improve and develop new assessment methods. The core RSAT assessment methods include:

Multi-criteria gap analysis – evidence is collected and analysed against the RSAT topics, criteria and qualitative performance statements that are designed to provide a basin-wide framework for assessment of sustainable hydropower development. The analysis will

identify gaps and priority issues in the sub-basin and assist in identifying relationships between the various aspects of development.

SWOT analysis – based on the RSAT topics and criteria and the available data and information for the basin, participants conduct a SWOT analysis for each topic to assess the strengths, weaknesses, opportunities and threats of sustainable hydropower development in the basin.

Action planning – based on the results of the multi-criteria and SWOT analyses the group identify technical, institutional and management responses that can be adopted to improve the level of sustainability performance and address key gaps and risks in the sub-basin.

Institutional mapping and gap analysis – based on the RSAT topics and the available data and information for the basin, assessment participants conduct a basic institutional mapping exercise.



There are five stages to an RSAT dialogue and assessment process

Establishment stage: A sub-basin for assessment is selected and preliminary scoping is conducted to determine the objectives of the assessment and identify key stakeholder groups.

Preparation stage: People are assigned to gather data and information for each topic and conduct preliminary research into the basin and its priority issues. Key stakeholders will be consulted to provide assessment input and data. The preparation stage includes selecting assessment methods, organising logistics, appointing a facilitator and preparing for the assessment process. The “RSAT Toolbox” and a range of user resources are available to assist with assessment preparation; they include guidance notes, checklists, templates and other resources – see Part 5.

Assessment stage: The group assessment and dialogue process takes place over a period of approximately five days and is usually led by a facilitator. The RSAT

assessment should take place at a location within the sub-basin and include a field visit either before or during the assessment. For each topic, data is presented and the group use the RSAT sub-topics, criteria and assessment methods to discuss, share knowledge and information and analyse the different aspects of development. Depending on the objectives of the assessment and the methods used, outputs may include the identification of risks and opportunities, a series of priority actions, a ranking of sustainability performance or a gap analysis report.

Reporting stage: The assessment results and outputs are presented in a report and the outcomes of the assessment are reported to the institutions responsible for follow-up actions.

Follow-up stage: Follow-up actions and further dialogues are progressed by responsible stakeholder groups as identified during the assessment.



About this document

This document is divided into 5 Parts:

After Part 1, which introduces the RSAT principles and uses, Part 2 provides the technical heart of RSAT – the framework of Topics and sub-topics, Criteria and Performance statements. Part 3 discusses how to prepare for and conduct an RSAT Assessment and Dialogue process; Part 4 shows how RSAT may be used in different applications – a series of How-To Guides; and Part 5 provides the RSAT Toolbox and references to other complementary tools and sources of information.

- 1 Introducing RSAT
- 2 RSAT Topics
- 3 RSAT Assessment
- 4 RSAT How-to Guides
- 5 RSAT Toolbox

PART 2: RSAT TOPICS





Part 2 provides an introduction and statement of intent for each Topic. The coverage of each sub-topic is described, followed by the Performance statements for each sub-topic and its criteria. Each Topic is provided with relevant guidance notes and definitions.

RSAT TOPICS AND CRITERIA

The RSAT provides a framework of 10 topics and 27 sub-topics for basin-wide hydropower sustainability. A set of four criteria as shown in the below box is used to analyse the RSAT topics, and sub-topics and forms the basis of the assessment.

Four criteria are used to analyse the RSAT topics and sub-topics

River Basin Planning and Management - focuses on the IWRM-based principles and practices in river basin planning and management and the collection of basin-wide-baseline data to inform these processes. The aim is to consider the different aspects of hydropower from a river basin perspective.

Energy / power sector planning and regulation - focuses on power sector planning, emphasizing hydropower planning and regulation.

Hydropower Projects - focuses on the plans, studies and management actions of all hydropower developers and operators in the basin at all stages of the project cycle (project identification, selection, planning, design, construction and operation).

Regulatory and governance - focuses on the regulatory and institutional framework for hydropower development and water resource management and enforcement at different levels from local to national.



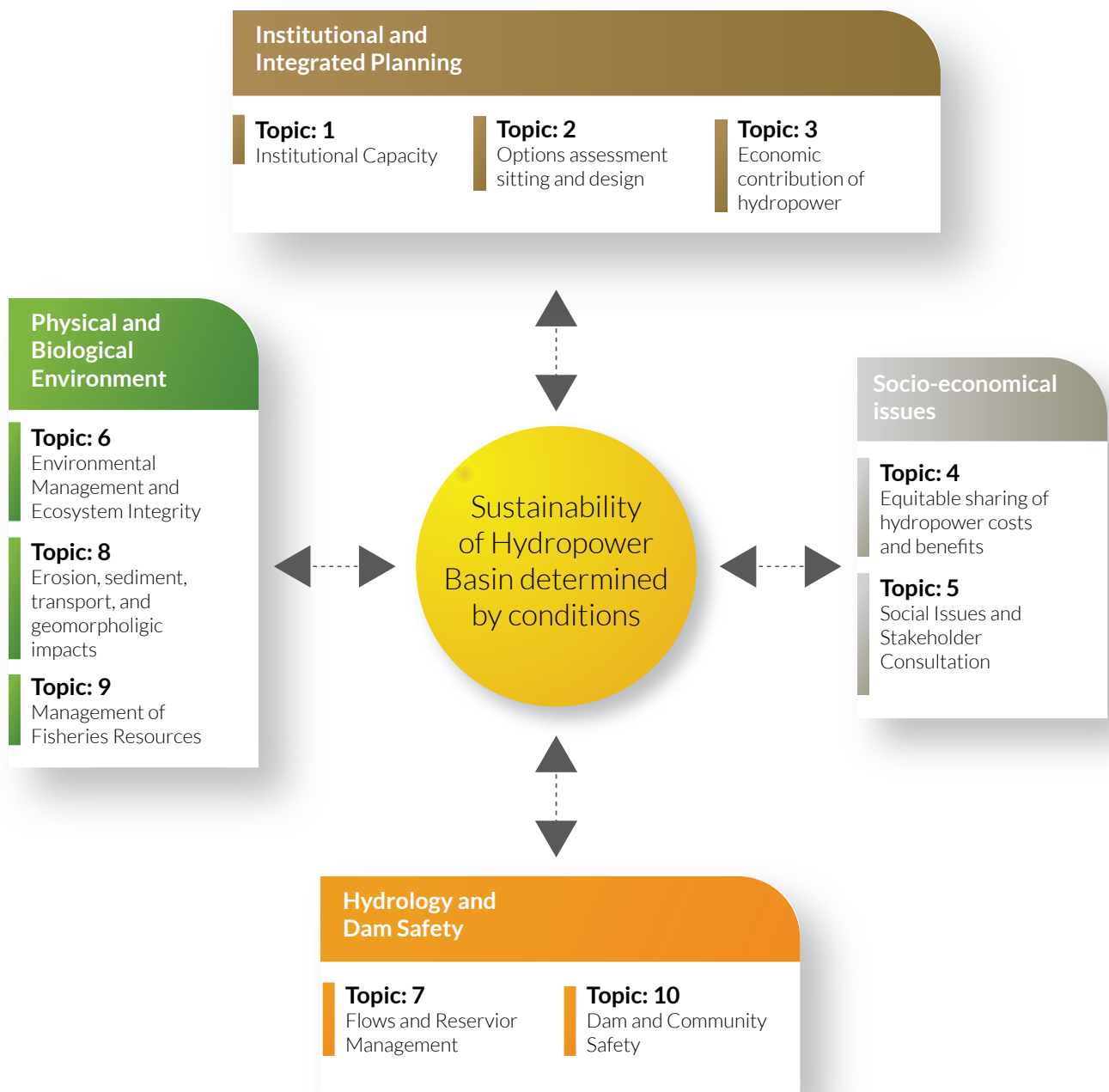
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9.1	Fisheries baseline and impact assessment
9.2	Management of impacts and fisheries resources
TOPIC 10 Dam and community safety	
10.1	Dam safety
10.2	Community safety and emergency response



Figure 4: shows the four groupings of RSAT topics:

- Institutional and Integrated Planning
- Socio-economic issues
- Physical and Biological Environment
- Hydrology and Dam Safety





TOPIC 1

Institutional capacity

The intent is that there is adequate institutional capacity and coordination between water resource planning and management and hydropower development to enable delivery of balanced and equitable development outcomes in a basin or sub-basin-wide context.

Sustainable hydropower development depends on the capacity and performance of a number of key stakeholder groups and their level of collaboration and interaction with each other. It is important that roles and responsibilities are clearly allocated within a legal and planning framework and that those agencies and authorities with responsibilities have adequate capacity and resources to implement plans and enforce regulations. The identification and resolution of conflict is another important aspect.

The assessment of this topic will focus primarily on the water and power sectors and the laws, regulations, policies, plans and the various institutions at different levels that have roles and responsibilities. The assessment will include a review of which laws are in place and how they are enforced within the frameworks that govern sustainable water resources and hydropower development.

Evidence to be reviewed under this topic will include agreements, regulatory frameworks, details of the various institutions with roles and responsibilities, compliance and monitoring reports.

Topic 1 has three sub-topics:

1.1 Transboundary institutional capacity

This sub-topic covers the institutional capacity to manage sustainable hydropower development within a transboundary basin or sub-basin shared between two countries with differing laws and regulations, levels of development of hydropower and information.

1.2 National to local institutional capacity

This sub-topic covers the institutional capacity within a basin at both national and local levels. It may also include the capacity to manage hydropower development between institutions in basins shared between two or more provinces.

1.3 Water and energy sector integrated planning

This sub-topic covers the institutions involved with planning in the water resources and energy sectors and the degree to which they have the capacity to integrate of their plans.



Performance statements for Topic 1 Sub-topics and Criteria:

1.1 Transboundary institutional capacity

A. River basin planning

A transboundary river basin organisation (RBO) exists within an agreed framework for transboundary basin cooperation and information collection and storage. Procedures and mechanisms exist for countries to notify and consult for hydropower projects on international rivers. Countries comply with their obligations and consult in good faith.

B. Energy / power sector planning and regulation

National energy agencies and regulatory authorities are represented in, and contribute to, transboundary basin planning processes.

C. Hydropower projects

Studies relating to hydropower projects on international rivers are implemented within agreed frameworks for transboundary cooperation. These frameworks also deliver transboundary communication and coordination during the hydropower operations stage.

D. Regulatory and governance

National laws and regulations are compatible with regional and international agreements, plans and policies, and include provision for transboundary impact assessment and consultation for projects on international rivers; regulations are enforced.

1.2 National to local institutional capacity

A. River basin planning

A national and provincial river basin planning and management framework exists and includes broad stakeholder participation across sectors. Arrangements for data management and sharing, conflict resolution and coordination mechanisms exist and include stakeholders from local to national levels.

B. Energy / power sector planning and regulation

National energy planning and regulatory agencies operate within a national sustainable development policy framework. Mechanisms for cross-sectoral coordination to address sustainability considerations of hydropower exist at all project stages.

C. Hydropower projects

Hydropower projects comply with relevant national laws and regulations at all project stages and disclose relevant data and reports. Risk and impact assessment studies are informed by adequate baseline data, apply the precautionary principle and are consultative. Management plans are implemented and their performance is measured.

D. Regulatory and governance

A national policy and regulatory framework for hydropower that promotes sustainable development and IWRM principles exists and is implemented. Responsible agencies have the capacity to implement and enforce hydropower and related policies, plans and regulations for new and existing projects. Capacity building plans exist to address gaps.



1.3 Water and energy sector integrated planning

A. River basin planning

RBO's, national and provincial water resource agencies and water-user groups exist and are consulted in hydropower planning studies, impact assessment studies and the design and implementation of mitigation plans and operating rules for projects.

B. Energy / power sector planning and regulation

Trade-offs and synergies between water and energy sectoral plans in the basin are identified in power development plans and addressed in the ranking of development options. Hydropower operating rules are institutionalised into water allocation policies and procedures in the basin.

C. Hydropower projects

Hydropower projects are represented in river basin planning and management processes and share data and information at all project stages. Hydropower projects collaborate with other basin stakeholders on IWRM including environmental and social management and monitoring programs for the basin.

D. Regulatory and governance

Regulatory and planning frameworks include the allocation of roles, responsibilities and mechanisms for integrated water and energy planning for hydropower, including requirements for cooperation, consultation and information sharing. Mechanisms exist to ensure policies and plans made by energy and water ministries and RBOs are aligned.





TOPIC 1

Guidance Notes and Definitions

■ **Examples of evidence** – national legislation, policy and regulations; RBO governance framework; budgets and resourcing plans for line agencies and RBOs; Transboundary procedures, e.g. data sharing, notification; evidence of meetings; hydropower plans, SEA reports, monitoring and auditing reports; compliance reports; hydropower monitoring reports and CSR policy; hydropower agreements (PDAs and PPAs) and MOUs; national policies relevant to hydropower; capacity building plans for line agencies and RBOs.

■ **Transboundary RBO** – an inter-government agency formed between national governments sharing a river basin to facilitate cooperation for river basin planning and management. Members may include all or some states sharing the river basin.

■ **Procedures for transboundary water management** – examples from the Mekong region include Prior Notification and Prior Consultation Agreement (PNPCA), Procedures for Water Quality (PWQ), Procedures for Maintenance of Flow on the Mainstream (PMFM).

■ **Project agreements** – examples include Memorandum of Understanding (MOU), Power Development Agreement (PDA), Power Purchase Agreement (PPA), and Concession Agreement (CA).

■ **Transboundary water-use agreements** – an agreement signed between countries sharing a river basin which provides a mutually agreed framework for cooperation on international rivers, e.g. the 1995 Mekong Agreement.

■ **Hydropower planning studies** – include options assessment, basin hydropower master plans, ranking and optimisation studies, feasibility studies, cost benefit analysis and project financial viability models.

■ **Institutional capacity** – in the context of hydropower and IWRM relates to the functions and capacity of the various institutions formed at different levels from

transboundary to local. It includes the effectiveness of the regulatory and planning frameworks in delivering sustainable water and energy development outcomes in a predictable, responsible, equitable and timely way. Examples include – cross-sectoral coordination, clear allocation of roles and responsibilities, adequate human and financial resources in government agencies, monitoring and evaluation processes in the planning cycle.

■ **Transboundary ESIA** – an assessment of impacts that may occur outside national borders of the country hosting a hydropower project or group of projects.

■ **Mechanisms for cross-border cooperation** – examples include RBO, committees, transboundary agreements, agreed procedures for notification and consultation.

■ **Integrated Water Resources Management (IWRM)** – a process which promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital eco-systems.

■ **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. Sustainable Development Goals, RAMSAR/CITES, United Nations Framework Convention on Climate Change (UNFCCC), Greater Mekong sub-region (GMS), UN Convention on the Law of the Non-navigational uses of International Water-courses (1997) (UNWC); and national legislation and regulations.



TOPIC 2

Options assessment, siting and design

The intent of Topic 2 is that the need for hydropower projects and the services they provide can be demonstrated in regional, national and provincial development plans and that hydropower planning includes comprehensive analysis of options and alternatives for water and energy service provision. The intent also is that siting and design processes result in optimal development outcomes.

Analysis of the options and alternatives available for development of water and energy services is an important consideration to ensure an optimal balance between a number of competing interests. Siting and design must consider many technical considerations (e.g. topography, water availability, geology, road access, transmission constraints) and social and environmental considerations (e.g. population displacement, downstream livelihoods, loss of habitat, flow modifications).

Siting and design within a government planning framework enables development optimisation more broadly at the basin level. The assessment of this topic will focus on how the need for hydropower has been identified at the national or basin level and the work that has been done to analyse a range of development options and alternatives to determine which scenarios are optimal.

At a more detailed level the topic then focuses on the processes that are in place to select sites for hydropower projects and consider how various impacts, needs and interests are addressed in the siting and design of projects and groups of projects, both existing and future.

Evidence to be reviewed will include hydropower feasibility studies, government hydropower and power development plans and options assessment studies, national water and energy development plans and policies.

Topic 2 has two sub-topics:

2.1 Demonstrated Need and Options Assessment

This sub-topic covers the assessments that have been carried out for water resource and hydropower development, and the requirements in power development planning for considerations of energy security, strategic social and environmental assessments. It also covers a consideration of options and studies of alternatives.

2.2 Siting and Design for Basin-wide Sustainable Development

This sub-topic covers the site selection process for hydropower, the application of multi-criteria analysis and optimisation studies, and risk assessments..



Performance statements for Topic 2 Sub-topics and Criteria:

2.1 Demonstrated need and options assessment

A. River basin planning

An assessment of all water resource development options and alternatives in the basin to meet needs for water services has been conducted in a consultative manner. Hydropower projects selected for development are a strategic fit with the need for water services in the sub-basin.

B. Energy / power sector planning and regulation

The need for hydropower to meet energy and water services has been assessed and can be demonstrated in national and regional objectives, policies and plans. An assessment of hydropower options and alternatives to meet demonstrated needs has been conducted. Hydropower can be demonstrated as the preferred option in the electricity supply generation mix and to meet water services.

D. Regulatory and governance

National laws and regulations include requirements for strategic environmental and social assessment of energy and hydropower options and the investigation of alternatives for energy and water services. Laws and regulations are enforced. Energy security, least cost supply considerations and fuel risks are explicitly managed in national planning processes.

2.2 Siting and design for basin-wide sustainable development

A. River basin planning

Siting and design is conducted within a basin-wide planning framework informed by adequate baseline data and in consideration of multiple project optimisation and cumulative impacts. Systematic and ongoing monitoring is conducted to fill key knowledge gaps. Performance and change is measured against baselines.

B. Energy / power sector planning and regulation

Multi-criteria options assessment and optimisation studies for one or more projects address basin-wide sustainability criteria for all projects (new and existing) in the basin. Studies are updated as more detailed information becomes available from feasibility and ESIA studies and monitoring programs. The sites and project configurations selected for development have avoided significant risks and addressed a number of sustainability criteria and technical risks at both the basin-wide and project level.

C. Hydropower projects

Siting and design has used appropriate expertise and baseline data. It has addressed a number of technical risks and sustainability criteria. Siting and design mitigation measures have been implemented to address identified risks, their performance is monitored.

D. Regulatory and governance

Guidelines for hydropower siting, design and operational mitigation measures have been developed; compliance provisions are included in project level agreements and are enforced consistently across the basin.





TOPIC 2

Guidance Notes and Definitions

■ **Examples of evidence** – options assessment studies; Integrated Water Resource Management (IWRM) plans; hydropower project pre-feasibility or feasibility studies; basin development plans; hydropower master plans national power development plans, strategic and cumulative impact assessment studies; national or regional development plans or policies.

■ **Design mitigation measures** – examples include multi-level off takes, fish passage structures, navigation locks, sluice gates, reservoir design and full supply level, re-regulation ponds, fish-friendly turbines, reservoir flood storage capacity, reservoir and river bank protection measures in project design, oxygenation plants, transmission line and road route selection.

■ **Operational mitigation measures** – examples include ramp down rates, reservoir operating levels, water releases for sediment flushing, sediment dredging, environmental flow release, downstream warning and notification systems.

■ **Timely consultation** – means that consultation on the project siting and design takes place at an appropriate time in the project cycle to enable informed planning and decision-making and within a reasonable timeframe for all parties involved.

■ **Options assessment** – **Energy** options assessment is a process to assess options and alternatives to hydropower in the energy mix to meet the energy demand, need for ancillary services or to earn export revenue in basins where electricity is exported. **Project** options assessment is a process to assess options and alternatives to different project sites and designs.

■ **Energy services** – examples include provision of electricity to domestic or export

markets; provision of grid stability; provision of peak load; provision of ancillary benefits such as spinning reserve, system regulation and improved efficiency.

■ **Water services** – examples include water storage, flood management, regulation of flow, irrigation supply, navigation, water supply, water for fisheries and floodplain agriculture.

■ **Energy Options** – examples include energy efficiency measures, increased efficiency in existing generation facilities, different types of energy such as thermal power or wind, no energy development, transmission and distribution options.

■ **Energy options assessment criteria** – optimise resource use efficiency; energy payback ratio; provision of ancillary services; optimise transmission efficiency; economic viability; minimise carbon intensity and greenhouse gas emissions; reduce social and environmental costs.

■ **Hydropower project options assessment criteria** – siting on tributaries instead of mainstream, multiple projects on one tributary as opposed to single projects on multiple tributaries, minimise the area flooded per unit of energy produced, prioritise alternatives that do not pose threat to vulnerable social groups; maximise multiple-use opportunities, prioritise options that minimise population displacement; prioritise options that maintain connectivity in the basin for migrating species and sediment; avoid sites downstream of major sediment production zones; avoid impact to exceptional cultural heritage; avoid impact to threatened species and critical habitats.

■ **Basin-wide baseline data** – refers to data collected at scientifically selected locations in the basin for the purpose of understanding the basin-wide natural, socio-economic and physical systems and interactions and to enable the measurement of change in the basin as a result of hydropower.



TOPIC 3

Economic contribution of hydropower

The intent of Topic 3 is that hydropower projects have the financial capacity to meet all costs over the life of the project and that hydropower development contributes a net economic benefit to regional and national economies in the long-term.

To be sustainable, hydropower projects need to have the financial capacity to meet all costs over the life of the project, deliver revenue and maintain assets to the required performance standards. This includes the financial capacity to manage existing and emerging risks and fund social and environmental mitigation, compensation and off-set measures. Hydropower projects should be planned, implemented and operated to achieve their intended purpose and make a positive contribution to economic development.

The assessment of this topic will focus on the processes for economic analysis of hydropower development and the contribution of hydropower to socio-economic development, including affordable and reliable electricity supply and water and energy services in the sub-basin. The capacity of projects to manage risk and fund social and environmental mitigation, compensation and off-set measures will also be considered.

Evidence to be reviewed will include economic development plans, cost benefit analysis studies, annual corporate reports, publicly available financial reports, hydropower feasibility and impact assessment studies.

Topic 3 has two sub-topics:

3.1 National economic and financial analysis

This sub-topic covers the necessary economic and financial analysis at both sector level and individual hydropower project level in the basin that shows the direct contributions to economic development of the country and basin, as well as the social and environmental costs.

3.2 Transboundary economic analysis

This sub-topic covers the contributions of hydropower in a transboundary basin to both national and regional economic growth in the context of international agreements and economic development plans for the basin. It also covers any studies such as SEAs and transboundary economic analysis.



Performance statements for Topic 3 Sub-topics and Criteria:

3.1 National economic and financial analysis

A. River basin planning

There is a baseline understanding of the social and economic value that water services provide to different sectors in the basin and their sensitivity to water allocation policy. Projects that are developed maximise national economic benefits and contribute to socio-economic development and poverty alleviation targets at national and local levels.

B. Energy / power sector planning and regulation

The national Power Development Plan (PDP) contains economic analysis on the national and sectoral costs and benefits of hydropower development and addresses social and environmental risks. Regulatory and contract mechanisms secure long-term government revenue streams for hydropower projects and cost efficiency in power generation and transmission.

C. Hydropower projects

Projects meet performance targets for revenue generation, water management, electricity dispatch and asset condition. Projects meet commitments to fund social and environmental mitigation and compensation measures over the economic life of the project and have the financial capacity to address emerging issues.

D. Regulatory and governance

Due diligence is undertaken to ensure the financial and technical capacity of project proponents and their investors, including their capacity to deliver agreed environmental and social mitigation measures. The economic contribution of hydropower is monitored and publicly disclosed.





3.2 Transboundary economic analysis

A. River basin planning

A transboundary basin development planning process and associated studies address the role of energy, hydropower and water resources development in national and regional economic growth. Economic and other data is contributed by each national government.

B. Energy / power sector planning and regulation

Transboundary economic analysis and SEA of hydropower development options on international rivers are conducted. The assessment of direct and indirect costs and benefits is conducted within a planning and consultation framework agreed by countries sharing the basin.

C. Hydropower projects

Projects on international rivers that proceed to development stage are accepted at a regional and national level in each country as being reasonable and equitable within the context of international agreements and economic development plans for the basin.

D. Regulatory and governance

A transboundary governance framework for regional cooperation on water and energy planning management exists. Progress towards basin and national economic development goals is regularly monitored and reported.

TOPIC 3

Guidance Notes and Definitions

■ **Examples of evidence** - regional economic integration plans, basin development strategy, sub-regional energy/development plans; hydropower development plan, ASEAN Charter, project feasibility studies, multiple use/optimisation studies, options assessment studies, consultation documentation with other sectors.

■ **Economic analysis** - is used to determine the costs and benefits of a project, policy or plan. CBA is usually a quantitative method that applies a monetary value to all project's costs and benefits. A project is assessed as economically viable if the benefits exceed its costs.

■ **Performance targets for water management** - includes compliance with reservoir level agreements, minimum flow releases, ramp down rates, minimum operating levels.

■ **Performance targets for asset condition**

- refers to meeting performance targets set in project agreements for the condition of assets at the end of a concession period; compliance with asset management commitments and operation and maintenance schedules.

■ **Indirect costs and benefits** - examples include creation of new industries, employment and trade as a result of new roads and infrastructure, economic displacement after a time period as a result of changes to water availability, loss of community harmony or stability.

■ **Reasonable and equitable use of an international watercourse** - is use with a view to attaining optimal and sustainable utilization and benefits, taking into account the interests of the riparian States concerned and consistent with adequate protection of the watercourse. It includes the right to use the watercourse and the duty to cooperation in the protection and development of the watercourse.



TOPIC 4

Equitable sharing of hydropower costs and benefits

The intent of Topic 4 is to ensure equitable resource use by distributing the benefits of hydropower equitably to river basin residents and across the economy to contribute to broader-based growth and support social equity policies.

The principle of benefit sharing is to spread hydropower benefits to river basin residents and across the economy to help to catalyse broader-based growth and support social equity policies. The idea is that communities and jurisdictions where hydropower is located at all project stages are counted amongst the first to benefit from hydropower projects and not the last.

Benefit sharing also includes the allocation of funds to support river basin planning and environmental management measures as well as watershed and ecosystem protection measures to off-set hydropower impacts. Although various forms of hydropower benefit sharing have been implemented in the Mekong region in recent years, benefit sharing is a relatively new concept and discussion is currently underway in each MRC member country to identify suitable options for comprehensive benefit sharing. There is currently no agreed mechanism in place in the Lower Mekong countries to assess or implement transboundary benefit sharing for hydropower.

During the assessment of this topic the group will gain an understanding of the different types of benefit sharing, including sharing monetary benefits, non-monetary benefits and project services and optimising additional benefits. The assessment will look at the different benefit sharing measures and how they are applied in the basin at different levels. This topic addresses the sharing of hydropower costs and benefits from transboundary to local levels and includes different forms of benefit sharing.

Evidence to be reviewed will include data and information relating to policies, regulations and mechanisms for benefit sharing and the various assessment studies and reports that are used to identify project beneficiaries.



Topic 4 has three sub-topics:

4.1 Transboundary Benefit Sharing

This sub-topic covers mutually agreed frameworks for countries sharing a river basin to consult on transboundary costs and benefit sharing options. This may include options for regional grid interconnections and joint ownership, as well as assessments carried out on transboundary risk and benefit sharing.

4.2 National to Local Benefit Sharing

This sub-topic covers provision for distribution of hydropower costs and benefits across sectors and communities in the sub-basin. It includes monetary and non-monetary benefits, which should be distinguished from compensation, with specific benefits for disadvantaged groups and women. Hydropower projects should have maximised opportunities to benefit communities in proximity to the project area, including through training, employment and capacity building programs.

4.3 Financing ecosystem protection and other measures

This sub-topic covers the financing mechanisms for hydropower schemes to provide ongoing contributions to environmental protection, natural resource management and social development projects in the basin, e.g. Payment for ecosystem services and biodiversity off-sets.

Performance statements for Topic 4 Sub-topics and Criteria:

4.1 Transboundary benefit sharing

A. River basin planning

A transboundary basin development plan or strategy provides a mutually agreed framework for riparian states to consult on transboundary cost and benefit sharing options. The plan includes provisions for assessment of hydropower development on international rivers or projects with impacts and benefits in more than one country, taking into account cumulative impacts.

B. Energy / power sector planning and regulation

Options for regional grid interconnection and joint hydropower project ownership are assessed. Transboundary benefit sharing arrangements relating to hydropower agreed between riparian states are embedded in project level agreements.

C. Hydropower projects

Assessment of transboundary cost and benefit sharing options, and target beneficiaries, is conducted for projects with impacts and benefits in more than one country within the national regulatory framework.

D. Regulatory and governance

International obligations for risk and benefit sharing resulting from transboundary agreements are imbedded in national mechanisms and procedures and include monitoring and evaluation provisions.



4.2 National to local benefit sharing

A. River basin planning

Basin-wide planning includes provision for distribution of hydropower costs and benefits across sectors and communities in the host sub-basin. Specific plans exist for women, ethnic groups and other sub-groups to access benefits. The development contribution of benefits is monitored at the local level, using disaggregated data and is publicly disclosed.

B. Energy / power sector planning and regulation

Monetary and non-monetary benefits from hydropower are distributed across sectors within a national to local policy and budget allocation framework. Communities in areas where hydropower projects are located are prioritised for rural electrification.

C. Hydropower projects

Project benefits and forms of benefit sharing are assessed and selected in consultation with beneficiaries. Project level commitments for additional benefits and benefit sharing arrangements are funded and implemented over agreed timeframes. Hydropower projects have maximised opportunities to benefit communities in proximity to the project area, including through training, employment and capacity building programs.

D. Regulatory and governance

Project agreements and regulatory mechanisms secure national revenues and provide for consistent distribution of socio-economic benefits from hydropower projects. Policy and planning approaches include provision to maximise local level benefits in hydropower sub-basins. Institutions and committees are established to ensure delivery of agreed benefit sharing measures and include reporting of expenditure and monitoring performance against benefit sharing targets.

4.3 Financing ecosystem protection and other measures

A. River basin planning

Hydropower revenue and other funding mechanisms e.g. Payment for Ecological Services (PES) contribute to ongoing funding of environmental protection, natural resource management and social development projects in hydropower sub-basins. There are adequate resources and human capacity for environmental protection and natural resource management measures in the sub-basin.

B. Energy / power sector planning and regulation

Assessment of opportunities for innovative financing including carbon financing (within the international framework) is conducted for hydropower development in the basin. National energy policy is in place to guide the allocation and expenditure of funds derived from carbon financing.

C. Hydropower projects

Hydropower ESIA studies, management plans and financial studies assess financing options (including carbon finance) to address the financing of environmental mitigation measures and



environmental off-set programs in the basin.

D. Regulatory and governance

A regulatory framework exists to secure sustainable financing from hydropower for a range of environmental off-set and watershed protection measures. Regulations are enforced; compliance and the effectiveness of measures are monitored by responsible authorities. Natural resource management and environmental agencies have adequate financial and human capacity to deliver core functions.

TOPIC 4

Guidance Notes and Definitions

■ **Examples of evidence:** project economic assessments, benefit sharing agreements, regulations and policies, monitoring and audit reports, transboundary benefit sharing agreements and regulations, PES policies or incentive schemes, PES agreements, Clean Development Mechanism (CDM) applications/guidelines, policies, Carbon finance agreements, revenue allocation agreements.

■ **Examples of “Benefits” of hydropower development:**

Reliable and affordable electricity, flood and drought control, government revenue, energy security, economic development, investment in associated infrastructure, construction related employment and livelihood opportunities.

■ **Examples of “Costs” of hydropower development:** Loss of land and biodiversity resources to inundation, loss of critical aquatic habitats or species, reduced natural resource productivity e.g. fisheries, opportunity cost to other sectors, loss of cultural heritage, food security risks.

■ **Types of benefit sharing mechanisms:**

Benefit sharing is a package of measures, not a single measure and is applied at different levels to meet different needs. The types of benefit sharing measures are:

- Monetary benefits- e.g. revenue sharing, ongoing community development funds, tax revenue
- Non-monetary benefits – e.g. watershed protection, reservoir fisheries and recreation
- Project services – e.g. electricity and water services, flood and drought control

- Additional benefits – associated with hydropower projects, e.g. roads, bridges, health clinics, improved housing and sanitation, schools, training and capacity building

■ **Policy and planning approaches to maximise local-level benefits** - examples include procurement policies to favour local employment and use of local products and services during project construction; local training and capacity building programs; strategies to maximise local infrastructure development e.g. roads, bridges; policies to improve provision of social services in affected areas, e.g. schools, clinics.

■ **Examples of projects with impacts and benefits in more than one country include:** electricity export / import projects; hydropower projects on international rivers with likely impacts on an upstream or downstream country; and hydropower projects on rivers that form national borders.

■ **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 5

Social issues and stakeholder consultation

The intent is that no people in the basin are worse off as a result of hydropower development.

Development of electricity infrastructure is intended to benefit broader society and improve the quality of life of basin residents. For hydropower development, there is a need for socio-economic baseline studies at the river basin level to understand the current situation of people living in the basin and the key socio-economic activities and basin resources that support their livelihoods. Hydropower projects conduct social impact assessment studies to identify how projects will impact on people in the basin, both upstream and downstream of projects and also to assess how the basin population can benefit from hydropower development.

People affected by hydropower need to be identified and consulted to ensure that their needs and interests can be addressed in planning and decision-making processes at all stages of hydropower development.

The assessment of this topic will focus on the level of social development planning and monitoring in the basin and to what extent hydropower projects contribute to social development or create negative social impacts in the basin. The assessment will include a review of the social baseline data that is available and how it is used to inform decision-making and planning and the regulations, plans and strategies that are in place to address negative social impacts.

A key aspect is how hydropower projects and river basin planning institutions in the basin identify stakeholders, and how they communicate and consult with them at different project stages. The assessment will also focus on the relationship between hydropower, food security and poverty in the basin and how population displacement and impacts to indigenous communities are avoided, minimised and / or compensated. This topic addresses the assessment and management of social and cultural impacts of hydropower development, including stakeholder identification and consultation, poverty alleviation, food security, livelihoods, population displacement and indigenous people.

Evidence to be reviewed will include social impact assessment studies, resettlement plans, social baseline data, national and provincial socio-economic development plans and hydropower social mitigation and compensation plans.



Topic 5 has 4 sub-topics:

5.1 Stakeholder identification and consultation

This sub-topic covers the identification of stakeholders in a river basin and the appropriate mechanisms of consultation throughout the different stages of hydropower development, from planning, siting and design, construction and operation, and institutionalisation through representative committees and RBOs etc.

5.2 Assessment and management of basin-wide social impacts

This sub-topic covers the necessary socio-economic studies and assessments, e.g. SIAs. It emphasises the need for proper baselines, disaggregated by gender and ethnic group and the identification of social risks associated with hydropower development, and the management of the impacts, through physical and economic resettlement; and compensation and the appropriate allocation of resources.

5.3 Food security and poverty alleviation

This sub-topic covers the specific impacts of hydropower on food security and poverty. There is a need for adequate baselines for indicators of income, food security, health and nutrition status of people around hydropower projects in the basin. Specific management measures will be needed to address these impacts.

5.4 Indigenous Peoples and Ethnic Minorities

This sub-topic covers the specific impacts of hydropower projects upon indigenous peoples and ethnic minorities. It requires an adequate baseline and impact assessment, with measures specifically designed to address these cultural impacts and economic impacts.

Performance statements for Topic 5 Sub-topics and Criteria:

5.1 Stakeholder identification and consultation

A. River basin planning

Stakeholder mapping and analysis has been conducted for the basin to identify key stakeholder groups in relation to water resources and their use. Lines of communication amongst river basin stakeholder groups on river basin planning issues are institutionalised through mechanisms such as representative committees, RBOs and other relevant institutions.

B. Energy / power sector planning and regulation

Energy and economic planning processes for hydropower are consultative and plans and project information are publicly disclosed.



C. Hydropower projects

Hydropower ESIA's include a detailed stakeholder mapping based on risks and vulnerabilities associated with the project. Meaningful consultation processes are timely and two-way at all project stages and address communication approaches and needs of impacted groups. Grievance mechanisms exist and are implemented.

D. Regulatory and governance

Regulations include requirements for information disclosure and consultation with communities affected by hydropower projects at all project stages. Compliance with consultation requirements is monitored.

5.2 Assessment and management of basin-wide social impacts

A. River basin planning

Basin-wide social baseline and regular monitoring is conducted and data is disaggregated. Basin-wide cumulative assessment of water resource development scenarios is conducted and indicators are used to measure impacts in the basin. Trends in social well-being are monitored at the district and basin level and equitable improvement in social well-being in the basin can be demonstrated.

B. Energy / power sector planning and regulation

National and regional energy planning by government agencies have prioritised the selection of hydropower sites that avoid or minimise population displacement.

C. Hydropower projects

SIA studies and management plans are consultative, appropriately timed, publicly disclosed and informed by baseline data. They address social risks, including economic displacement in both the inundated and downstream areas and allocate responsibility for implementation and monitoring. Plans to address social impacts, including resettlement plans are adequately funded and implemented in an equitable manner.

D. Regulatory and governance

Regulations and policies for hydropower SIA, resettlement action plans and livelihood restoration exist and are enforced. The suitability of land allocated by authorities for resettlement is assessed in consultation with resettlement communities. Funds, resources and institutional responsibilities are allocated to implement and evaluate resettlement activities and livelihood restoration in all project stages. Independent arbitration mechanisms exist to resolve disputes.



5.3 Food security and poverty alleviation

A. River basin planning

A basin-wide baseline of income, food security, health and nutrition status exists. Data is disaggregated by gender and other social groupings. Social groups in hydropower sub-basins with low baseline social indicators experience a measurable and timely improvement in income, food security, nutrition and health status as a result of development.

B. Energy / power sector planning and regulation

National and regional energy planning by government agencies have prioritised the selection of hydropower options that enhance food security and avoid significant risks to the nutrition status of the basin population.

C. Hydropower projects

ESIA studies assess the impact and benefits of hydropower on poverty, nutrition, public health, education and food security status of women, men and children upstream and downstream of projects. Management plans specifically address social risks and the health, nutrition and livelihood status of project-affected communities is monitored and publicly reported.

D. Regulatory and governance

Poverty alleviation and food security policies and plans are in place that set binding targets and objectives at national and district levels and are implemented. Monitoring and evaluation of the implementation of these plans and regulations exists for water and energy development projects with regular public reporting.

5.4 Indigenous peoples and ethnic minorities

A. Basin planning

Basin-wide socio economic data is disaggregated by ethnicity and gender. Data is available on indigenous people and ethnic minorities (hereafter indigenous people) and their reliance on land and water resources for livelihoods and cultural practices. The impact of water development scenarios, on indigenous men, women and children is assessed in water resource planning processes.

C. Hydropower projects

Hydropower SIA studies and management plans include culturally appropriate good faith consultation with indigenous women and men. Indigenous people's plans are implemented and include effective grievance mechanisms for indigenous people to raise issues and receive feedback. Indigenous people give consent for the plans and aspects of the project that affect them directly.

D. Regulatory and governance

The regulatory framework for hydropower includes requirements to consult with and assess impacts to indigenous men and women in project SIA's and develop indigenous people's action plans. The performance of indigenous people's plans is monitored; grievance mechanisms are enforced and action is taken to address issues that arise.



TOPIC 5

Guidance Notes and Definitions

■ **Examples of evidence:** evidence of good faith negotiations, evidence of support information provided to stakeholders – accuracy and quality of communication, watershed plans, and hydropower strategic communication.

■ **Disaggregated social data** – data that is separated by social sub-groupings for example, sex, age, ethnicity, income, education levels etc. Disaggregated data enables analysis of how certain interventions will affect certain sub-groups (e.g. men and women) differently.

■ **Social baseline data** – includes, household income, demographic data, cultural heritage, socio-economic condition, protein intake, health and nutrition status, access to water and sanitation, household assets and resources, access to natural resources, household food access and consumption, livelihood activities, land and water resource dependencies.

■ **Equitable improvement in social well-being and socio-economic development** – refers to an improvement in social indicators and income status across all sub-groups in the sub-basin. The intention is that there is no increased disparity in the status of social sub-groups in the basin as a result of hydropower development and that the most disadvantaged sub-groups access development opportunities.

■ **Social risks include;** public health risks (e.g. HIV as a result of an influx of migrant workers during construction, increase in water borne diseases as a result of reservoirs, loss of domestic water supply due to water quality changes), livelihood risks (e.g. loss of income; decline in access to natural resources); safety risks (e.g. increased or unpredictable flooding, sudden water release) and cultural risks (e.g. loss of physical cultural heritage or cultural and spiritual values).

■ **Indigenous peoples and ethnic minorities** is a term used in a generic sense to refer to a distinct, vulnerable, social and cultural group

possessing the following characteristics in varying degrees: (i) self-identification as members of a distinct indigenous cultural group and recognition of this identity by others; (ii) collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories; (iii) customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and (iv) a distinct language, often different from the official language of the country or region.

■ **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).

■ **Consent** – refers to a collective expression by the affected Indigenous Peoples communities, through individuals and/or their recognized representatives, of broad community support for the project activities that affect them. Such broad community support may exist even if some individuals or groups object to the project activities. Other definitions of consent refer to a need for signed agreements with community authorised leaders or representatives of communities.



■ **Good Faith Engagement** – engagement that is undertaken with an honest intent to reach a mutually satisfactory understanding on the issues of concern.

■ **Cultural impacts** include impacts to: traditional/indigenous land and water-use practices; physical cultural heritage sites, ceremonial; sacred and non-sacred rituals; religious; and spiritual connections to place; changes in systems of communication, transport and trading. These uses may be by indigenous or other ethnic groups in the basin.

■ **Public health risks** include: vector borne diseases (e.g. malaria, schistosomiasis) associated with water impoundments; loss of food resources and decline in nutritional status, communicable diseases; diseases introduced to remote communities by construction workforces; social and psychological disorders, water quality related health issues.

■ **Involuntary resettlement plan** - as a minimum, a resettlement 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 redress mechanisms; legal framework; entitlements, assistance and benefits; relocation of housing and settlements; income restoration and rehabilitation; resettlement budget and financing plan; institutional arrangements; implementation schedule; and monitoring and reporting of outcomes.

■ **Food security** - at the individual, household, national, regional and global levels [is achieved] when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.





TOPIC 6

Environmental management and ecosystem integrity

The intent is that a basin-wide environmental baseline informs hydropower decision-making and that hydropower is developed and managed in a way that maintains basin-wide ecosystem integrity.

Hydropower projects fundamentally alter ecosystems through inundation, the regulation of water flow, effects on water quality, the creation of barriers to aquatic migration and modification of habitats. Basin-wide ecosystem integrity relies upon the protection of critical ecosystem functions from negative impacts where feasible and the maintenance of ecosystem connectivity as an integral part of hydropower planning and decision-making. This could mean protecting certain tributaries from development or establishing protected areas in other parts of the basin to off-set the loss of values in the tributaries that are developed.

The assessment of this topic will focus on basin-wide water resources, environmental management and biodiversity conservation frameworks, and the environmental impact assessment studies and management plans associated with hydropower projects. The assessment will include a review of the environmental baseline data that is available and how it is used to inform planning and decision-making for hydropower. The policies, regulations and plans that are in place to protect basin ecosystems from negative impacts will also be reviewed.

Evidence to be reviewed includes environmental baseline studies, hydropower environmental impact assessment studies and management plans, institutions, regulations and policies relating to environmental protection and environmental monitoring reports.

Topic 6 has two sub-topics:

6.1 Assessment and management of basin-wide environmental impacts

This sub-topic covers the various levels of environmental impact assessment (SEA, EIA, CIA) carried out at different stages of project development and the environmental management and monitoring plans (EMMPs) developed to address the different impacts. For operational plants, it would include ongoing monitoring and response to arising environmental issues.

6.2 Biodiversity conservation and ecosystem integrity

This sub-topic covers the impacts upon terrestrial and aquatic biodiversity, and measures to manage and protect the habitats and ecosystems affected by hydropower projects in the basin. The inevitable changes and losses of biodiversity may be compensated as a last resort through biodiversity off-set schemes.



Performance statements for Topic 6 Sub-topics and Criteria:

6.1 Assessment and management of environmental impacts

A. River basin planning

Ongoing and systematic environmental baseline and regular monitoring is conducted in the basin to identify environmental changes and hotspots, and fill knowledge gaps associated with hydropower risks. Regular State of the Basin reporting identifies the environmental baseline condition, key pressures and trends in the basin. Environmental indicators are developed for hydropower, and performance is measured.

B. Energy / power sector planning and regulation

Strategic and cumulative environmental assessments are conducted for power development plans and hydropower master plans. Project agreements include provision for the ongoing identification and management of cumulative environmental impacts during the project life and the need for coordination with other projects in the basin to manage current and future environmental impacts.

C. Hydropower projects

Hydropower projects apply a systematic approach to the identification, management and monitoring of environmental impacts at all project stages, using suitable expertise. Pre-project environmental baselines are established against which future change is measured. EIA's, environmental management plans and monitoring reports are publicly disclosed and implemented in a timely manner.

D. Regulatory and governance

A regulatory framework for hydropower environmental impact assessment, management and monitoring exists and is enforced in a timely manner. Cumulative and basin-wide environmental impacts beyond individual project sites are considered in the regulatory and planning processes for hydropower, and the environmental performance of hydropower is measured at the basin scale.

6.2 Biodiversity conservation and ecosystem integrity

A. River basin planning

Basin-wide baseline data includes aquatic and terrestrial species abundance, biodiversity, habitat range, reproductive behaviour, and critical habitats. The impact of habitat modification and fragmentation, and flow regulation on biodiversity is assessed. Strategies are developed in the hydropower planning processes to site, design and operate projects to maintain ecosystem connectivity at the basin level.

B. Energy / power sector planning and regulation

Hydropower options and ranking studies aim to avoid project sites and designs that have significant negative impacts on biodiversity, environmental hot spots or protected areas.

C. Hydropower projects

Biodiversity and ecological baseline data informs hydropower EIA studies. Project siting and design includes provisions for basin-wide ecosystem connectivity and the avoidance and



mitigation of significant impacts. Biodiversity off-set programs are implemented and include the protection of areas with equivalent values to those lost.

D. Regulatory and governance

Policy and regulations for environmental protection exist and are enforced. Biodiversity conservation zones are legally protected from negative impacts. Compliance with off-set, management and compensation plans is enforced and action is taken to address issues that arise.

TOPIC 6

Guidance Notes and Definitions

■ **Examples of evidence** - strategic environmental assessments at the basin or sector level; hydropower/basin development options studies; initial environmental examinations and/or EIA for specific projects at the feasibility study stage; environmental management plans; basin-wide ecosystem studies and inventories; biodiversity management plans; habitat assessment studies; policies, regulations and agreements to protect biodiversity in the basin; national high value rivers policies, inventory of high value rivers and their biodiversity value, basin development plan/ IWRM plan; environmental monitoring reports and databases.

■ **Environmental hotspot** - areas featuring exceptional concentrations of endemic species or biodiversity or providing key ecosystem services and are under threat from human activity. This may include critical habitats for threatened species and areas of key importance for maintaining livelihoods, wetland ecosystems.

■ **High value tributaries** are those that if left undeveloped and in a close to natural state will make a significant contribution to the overall ecosystem integrity and biodiversity of the river basin which may off-set the loss of some tributaries to development.

■ **Environmental indicator** - An environmental indicator is a parameter, or a value derived from parameters, that points to, provides information about and/or describes the state of the environment, and has a significance extending beyond that directly associated with any given parametric value. The term may encompass indicators of environmental pressures, conditions and responses.

■ **Ecosystem connectivity** – The interconnection of different habitats to allow species movement. This includes creating and managing habitat corridors and buffers, as well as preventing further fragmentation of habitats by development and other land-uses.

■ **Biodiversity off sets** – actions taken to address a loss of biodiversity as a result of a project or intervention. For example, gazetting a protected area of forest to off-set the loss of equivalent forest that has been inundated by a hydropower reservoir.

■ **Policy and regulations for environmental protection** – examples include threatened species and protected area legislation, EIA legislation, threshold limits set and enforced.

■ **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.

■ **Critical habitat** - includes areas with high biodiversity value, including habitat required for the survival of critically endangered or endangered species; areas having special significance for endemic or restricted-range species; sites that are critical for the survival of migratory species; areas supporting globally significant concentrations or numbers of individuals of congregatory species; areas with unique assemblages of species or which are associated with key evolutionary processes or provide key ecosystem services.



TOPIC 7

Flows and reservoir management

The intent of Topic 7 is that hydropower planning and management for inflows, reservoirs and downstream and environmental flows exist within an agreed water-use framework to achieve multiple social, environmental and economic objectives.

Reliable hydrological resources are fundamental to sustainable hydropower development. Understanding the water resources through monitoring and management is essential to ensure reliable electricity generation and efficient use of the water resource for all water-users in the basin. Hydropower projects alter natural flow regimes in the basin, which can result in changes to water quality, water temperature, the seasonal variation of flows and flood and drought cycles.

People in the basin depend on certain flows to support their economic activities, such as floodplain agriculture or fishing. When flows change, these production systems also change. Hydropower projects in a cascade or sharing a basin need to share data and optimise use of the water resource between upstream and downstream projects and in consultation with other water-users in the basin.

The assessment of this topic will focus on how flows in the basin are understood and managed and the institutions, policies, regulations and plans that exist in the basin to govern the efficient use of water resources and equitable water allocation. The assessment will include a review of how hydropower projects assess and manage impacts to flow regimes at all project stages, including analysis of inflows and outflow capacity, the management of hydropower reservoirs and downstream flow requirements. The shared use of water resources in a basin can cause conflicts between different water-uses and the assessment will include consideration of the different mechanisms in place for water-users to resolve conflicts.

Evidence to be reviewed will include hydrological studies, hydropower EIA and feasibility studies, environmental flow assessments, reservoir management plans, national and local institutions, plans, policies and regulations relating to water-use and water allocation in the basin.

Topic 7 has 5 sub-topics:

7.1 Multiple water-use optimisation and efficiency

This sub-topic covers the hydrological assessments and models which can be used for balancing and optimising different water-uses. It also includes the impacts of climate change upon water availability and demand.



7.2 Reservoir planning and management

This sub-topic covers the planning and management of reservoirs for both hydropower operation and for other uses of the reservoir. It includes clearance of reservoir vegetation to limit greenhouse gas emissions and poor water quality, reservoir filling and operation to limit downstream hydrological impacts.

7.3 Coordinated hydropower operations

This sub-topic covers the coordination between multiple hydropower plants, e.g. in cascade in a river basin and with other uses to achieve better balance of flows and optimisation of operations. It also includes coordination of releases for dam safety.

7.4 Downstream and environmental flows.

This sub-topic covers the management of downstream flow regimes below hydropower plants. It would include environmental flow assessments and compliance with agreements for releases to maintain ecosystem functions and services downstream.

7.5 Flood and drought management

This sub-topic covers the management of water flows for flood and drought protection. It covers forecasting systems and capacities of the reservoirs to absorb flood waters, and for agreed releases downstream during droughts.

Performance statements for Topic 5 Sub-topics and Criteria:

7.1 Multiple water-use optimisation and efficiency

A. River basin planning

Baseline data exists on water availability, demand and consumptive and non-consumptive water-use, including navigation and fisheries. A hydrological model has been developed for the basin and addresses different water-use scenarios. The effect of climate change on future water availability and flows is assessed.

B. Energy / power sector planning and regulation

Multiple use projects are prioritised in government options assessment, optimisation and ranking studies.

C. Hydropower projects

Hydropower feasibility studies are consultative and seek to enhance design and operational opportunities for multiple-use where feasible. Hydropower projects coordinate with other agencies and water-users in the operations stage to achieve agreed multiple-use objectives.

D. Regulatory and governance

A water-use framework exists in domestic legislation and international agreements that sets limits, rules and procedures for consumptive and non-consumptive water-use in the basin. Monitoring of water-use is conducted. Regulatory mechanisms exist for the resolution of water allocation conflicts.



7.2 Reservoir planning and management

A. River basin planning

Government water and energy agencies conduct integrated planning to set operational limits for hydropower operations such as, full supply levels, drawdown limits and water release requirements, to integrate with power generation requirements. Reservoir planning, impoundment and operations are conducted within agreed water management limits and thresholds for the basin.

B. Energy / power sector planning and regulation

Projects selected for development aim to minimise the area flooded per unit of energy. Schemes make best use of storage characteristics and operations to meet current and future electrical load patterns and other water demands in the basin.

C. Hydropower projects

Reservoirs are designed to avoid, mitigate and off-set impacts, including loss of forest resources, population displacement and greenhouse gas emissions. Reservoir filling plans address biomass removal, the timing of environmental and social plans and downstream impacts. Reservoir filling and operational procedures are in place to address reservoir management issues.

D. Regulatory and governance

Project agreements and regulations provide clear institutional arrangements for reservoir ownership, access and management responsibility. Roles and responsibilities are allocated and there is a coordinated approach to managing compliance with reservoir management, operating rules, storage and release commitments.

7.3 Coordinated hydropower operations

A. River basin planning

There is allocation of responsibility and institutional arrangements in place for coordinated water management and power generation in the basin amongst multiple projects. Hydropower operations coordinate with other water-users in the basin.

B. Energy / power sector planning and regulation

Coordination of the power system, including hydropower cascades, makes optimal use of hydropower capability (peaking, load following) and achieves balanced and equitable water-use at the sub-basin level. Project level agreements include provision for coordination of operations amongst projects in a cascade or sub-basin and consistent design and operational mitigation measures.

C. Hydropower projects

Projects coordinate their operations to achieve basin objectives, efficient water-use and optimise electricity generation. Design and operational environmental mitigation measures are consistent and coordinated between projects to optimise outcomes.

D. Regulatory and governance

A regulatory framework for hydropower includes provision for multiple projects in a cascade to coordinate at all project stages for optimal electricity generation, and efficient resource use. Transboundary mechanisms exist for coordination and cooperation for hydropower operations on international rivers.



7.4 Downstream and environmental flows

A. River basin planning

Environmental flows assessment has been conducted for all river reaches affected or potentially affected by hydropower operations to establish criteria and thresholds for environmental and downstream flows. It includes assessment of wetlands and floodplains. It is consultative and informed by scientific baseline data.

B. Energy / power sector planning and regulation

Water management constraints on electricity dispatch are embedded in electricity dispatch and off-taker agreements. Compliance is monitored and publicly disclosed. Project agreements include design and operational performance criteria to deliver agreed environmental and downstream flows.

C. Hydropower projects

Projects conduct environmental and downstream flow assessments in the feasibility stage to inform project design and operations. Project design and operation rules address commitments made for environmental flows and downstream water releases. Hydropower projects comply with environmental and downstream flow commitments.

D. Regulatory and governance

International agreements, national laws and basin plans relating to water allocation include provision for environmental flows. ESIA regulations and guidelines include provision for environmental flow assessment. Where commitments are made for environmental and downstream flows, effectiveness is monitored at agreed sites.

7.5 Flood and drought management

A. River basin planning

A basin flood and drought management plan includes flood monitoring and forecasting systems, and planning for flood and drought response.

B. Energy / power sector planning and regulation

Project agreements and electricity dispatch arrangements include provision for design and operational flood and drought response measures. Agreements include provision for flood management to be prioritised over power generation in emergency situations.

C. Hydropower projects

Operating rules, project design, and management plans include flood and drought mitigation measures that comply with statutory plans and are implemented. Response to flood and drought is coordinated amongst projects in a cascade.

D. Regulatory and governance

National and provincial governments have flood and drought plans and policies in place, including allocation of roles and responsibilities. Plans are implemented and enforced and the response to drought and flood events is managed in a coordinated manner in the basin.



TOPIC 7

Guidance Notes and Definitions

■ **Examples of evidence:** ESIA reports, project design and feasibility studies, operating rules and project agreements, flood and drought management plans, water allocation plans and policies, IWRM plans, multiple use studies, options assessment.

■ **Multiple use** – refers to a hydropower project that is designed and operated for other uses in addition to hydropower and may include; irrigation storage, navigation; flood control; flow regulation; reservoir fisheries, recreation.

■ **Design and operational flood and drought response measures** – examples include maintenance of reservoir flood storage capacity, mechanisms to alter hydropower generation to respond to flood control needs.

■ **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 and nature.

■ **Reservoir management issues** – examples include water quality issues, including eutrophication, bank slumping and erosion, recreational and commercial reservoir uses, public safety, flood management, navigation, thermal stratification, public access, greenhouse gas emissions and debris management.

■ **Project design for downstream flows include:** variable outlet and turbine generator capacities; multi-level, selective withdrawal outlet structures; sediment sluice gates, fish passage structures, environmentally friendly sediment flushing procedures, coordinated operations of cascades of dams; re-regulation of reservoirs; operational rules for sediment passage or environmental flow release; re-operations of existing dams; flood management procedures in floodplains; and flexibility to modify dam operations in the future.

■ **Examples of consumptive water-uses** – irrigation, urban water supply, rural water supply, industrial uses, livestock.

■ **Examples of non-consumptive water-uses** – fishing and aquaculture, tourism and recreation, flood control, ecosystem maintenance, cultural and spiritual, navigation.

■ **Timing of environmental and social plans** – means that sufficient time is allowed to implement environmental and social plans before reservoir filling commences. Examples include the resettlement actions plan and arrangements for populations to be relocated to suitable accommodation before reservoir filling commences and sufficient time for vegetation and wildlife removal.

■ **Water management constraints on electricity dispatch** – examples include environmental or downstream minimum flow release, reservoir level agreements, ramp down rates, commitments to maintain flood storage capacity.

■ **Biomass removal** – the removal of vegetation from a reservoir to address water quality risks and reduce reservoir emissions as a result of vegetation inundation and decay.

■ **River reaches affected by hydropower operations** – are assessed on a project by project basis and may extend several hundred kilometres downstream for large projects depending on the scheme size, project design and operation, the characteristics of the river system, the extent of seasonal storage and flow regulation, use of diversions, etc.

■ **Inter-reservoir operating rules** – rules established for coordinated operations and water management between reservoirs in a cascade.

■ **Ramp down rates** – the rate at which the water level falls in the reservoir as the result of hydropower operations. Slower ramp down rates can reduce impacts to the reservoir and downstream environment that may occur as the result of a rapid drop in water level.

■ **Electricity dispatch systems** – the system in place for dispatch of electricity from the hydropower station, which may be a centrally controlled integrated dispatch centre for multiple projects or a single off-taker arrangement.

■ **Reservoir storage characteristics** – includes; flooded area, bathymetry, full supply level, minimum operating level, debris control structures.



TOPIC 8

Erosion, sediment transport and geomorphological impacts

The intent is that erosion and sediment dynamics are understood at the basin level and hydropower impacts are identified and managed effectively to minimise downstream social, economic and environmental impacts and maximise reservoir life span, asset reliability and efficiency.

Sediment transport and deposition is an important issue for hydropower development in a river basin such as the Mekong. Dams and reservoirs can trap sediments being transported down the river and this may reduce the storage capacity and life span of a hydropower reservoir, create higher maintenance costs and therefore affect the financial viability of projects. When sediment is removed from a river system as a result of trapping or extraction, bank erosion can significantly increase in downstream river reaches and delta areas. There are technologies available to flush sediments through dams and they require a detailed baseline understanding of sediments and careful planning and design to ensure their effectiveness.

This assessment of this topic will focus on scientific studies and the level of understanding of different sediment sources and characteristics and the processes that control erosion, sediment transport and deposition in the basin. The assessment will include a review of how hydropower projects have assessed impacts in EIA studies and the design and mitigation measures in place at all project stages to control erosion and the impacts resulting from disruption to sediment transport and deposition. The contribution of other land and water-users in the basin to erosion, sedimentation and geomorphological impacts will also be considered as well as the basin-wide management responses and collaboration required.

Evidence to be reviewed will include baseline scientific studies, hydropower EIA and EMP reports, information on basin-wide land use practices relevant to the topic and the management measures, institutions, plans and policies in place to address impacts.

Topic 8 has two sub-topics:

8.1 Baseline and impact assessment

This sub-topic covers the assessment of sediment transport and erosion in the river system, and the contribution of sediment downstream in the main river down to the delta. It would include other uses of sediment, e.g. sand and gravel mining in the river. EIAs should consider the impacts of the hydropower project trapping sediment, and the erosion of river bed and banks downstream during operation.



8.2 Management of impacts and sediment resources.

This sub-topic covers the management of the impacts of sediment and erosion, through improved watershed management to reduce the sediment reaching the reservoir, through various types of sediment passage through the reservoir and dam, e.g. sediment flushing and the measures to protect downstream river bed and banks from erosion.

Performance statements for Topic 8 Sub-topics and Criteria:

8.1 Sediment baseline and impact assessment

A. River basin planning

A basin-wide baseline and ongoing monitoring of sediment sources and characteristics, land use, sand extraction, river morphology and hydrology exists. It includes studies of sediment production zones and the processes that control erosion, sediment transport and deposition. The role of sediments in natural resource productivity and river bank stability is assessed.

B. Energy / power sector planning and regulation

Hydropower options assessment and power planning studies include criteria to rank technical, financial and economic risks associated with project sites located downstream of major sediment production zones.

C. Hydropower projects

ESIA studies include the development of a sediment budget, potential for and magnitude of sediment trapping, and impacts to downstream sedimentation processes and river bed and floodplain forms. The impact on reservoir life-span as a result of sediment trapping is included in project level assessments.

D. Regulatory and governance

ESIA guidelines and MOU's include requirements to assess erosion, sediment transport and geomorphological impacts. Standards or guidelines exist and are enforced for design and operational requirements for hydropower sediment management and flushing. Regulatory authorities commission cumulative impact assessments in basins with multiple projects.

8.2 Management of impacts and sediment resources

A. River basin planning

Management plans exist and are implemented to address erosion impacts from land and water-use activities and the in-stream extraction of in-river sand, gravel and cobbles. Regulations are enforced to ensure the sustainable extraction of in-river sediment and mineral resources.



B. Energy / power sector planning and regulation

Guidelines and standards exist for the avoidance and mitigation of sediment trapping risks in hydropower reservoirs. They are enforced and applied to all new projects in the basin to manage technical and financial risks. Project agreements include design and operating requirements for sediment flushing where high potential for sediment trapping is identified.

C. Hydropower projects

Hydropower projects in the basin are sited, designed and operated to avoid and minimise trapping of sediment in reservoirs and downstream geomorphological impacts. Where sediment flushing will be required, reservoir bathymetry studies and a sediment flushing feasibility study and EIA is conducted to inform sediment flushing design and operating rules.

D. Regulatory and governance

Regulatory authorities monitor compliance against regulations and management plans and the effectiveness of management measures.

TOPIC 8

Guidance Notes and Definitions

■ **Examples of evidence** – sediment baseline and monitoring reports; projects EIA's; feasibility studies; guidelines for sediment management; land use planning documents; IWRM plans; basin sediment budget; geomorphological mapping or river characterisation studies.

■ **Sediment production zones** – areas of a basin that contribute sediment to the river system as a result of erosion.

■ **Processes that control erosion, sediment transport and deposition** – examples include flow velocity, bed slope, floodplain form, channel characteristics, land use, geology and run-off.

■ **Sediment flushing feasibility and EIA** – is required to assess whether sediment flushing is feasible for a hydropower project. In some cases, sediment flushing is not possible due to project or river basin characteristics. The feasibility of sediment flushing will depend on reservoir bathymetry, sediment characteristics, flow, generation constraints, dam wall design and sediment passage structures. An EIA study is required to determine the environmental impact of sediment flushing on the downstream environment to inform design of environmentally friendly sediment flushing.



TOPIC 9

Management of fisheries resources

The intent of Topic 9 is that hydropower and water resources are developed in a way that allows for the protection and further development of fisheries resources in a basin, and that fishery dependent communities are not worse off as a result of hydropower.

Fisheries resources can be impacted by hydropower development in a number of ways, including the blocking of important fish migration routes, change in flows and water quality, and changes in critical habitats that can reduce the viability and size of the fishery.

Hydropower development may aim to avoid and minimise negative impacts to the fishery or it may involve trade-off's to the fishery sector in which case alternative livelihoods and sources of nutrition for fish dependent communities need to be found. The potential for alternative fishery plans, including reservoir fisheries and aquaculture, may be considered to off-set the negative impacts of hydropower on fisheries resources.

The assessment of this topic will focus on the level of scientific understanding of the fishery, the processes that support its productivity and the level of fisheries management and monitoring in the basin. The assessment will include a review of hydropower EIA and management plan studies to see how fishery impacts are assessed and management responses are implemented for individual and groups of projects. The basin-wide aspects of fishery management will also be reviewed to identify the institutions with roles and responsibilities relating to fisheries management, and how the regulations, plans and management measures are enforced and implemented.

Evidence to be reviewed will include; basin fish studies and baseline assessments of the environmental and social aspects of fisheries, hydropower EIA's and management plans, fisheries management plans, policies and regulations and the activities of the institutions with roles and responsibilities relating to fisheries.

Topic 9 has two sub-topics:

9.1 Baseline and impact assessment

This sub-topic covers the understanding of the river fishery resources through baseline and monitoring surveys, and impact assessment both upstream where the reservoir is created and downstream fisheries that may be affected by changes in flows and water quality. It would also include fish biodiversity and threatened species.



9.2 Management of impacts and fisheries resources.

This sub-topic covers the development of fishery management plans to address the impacts and develop the new fishery resources within the reservoir and downstream. It could include specific measures to manage the reservoir ecosystem and protection of habitats upstream of the reservoir, as well as aquaculture development and technical assistance to fishermen for developing the reservoir fishery.

Performance statements for Topic 9 Sub-topics and Criteria:

9.1 Fisheries baseline and impact assessment

A. River basin planning

A basin-wide baseline and regular monitoring of fisheries resources including catch and consumption, biodiversity, habitat range and migratory behaviour of fish and other aquatic species exists. Data is disaggregated by fishery types, including in-river, floodplain, reservoir, rice paddy and aquaculture fisheries.

B. Energy / power sector planning and regulation

Energy options assessment and hydropower optimisation and ranking studies includes analysis of socio-economic trade-offs between hydropower and the fishery sector at national and local levels.

C. Hydropower projects

EIA studies use appropriate fishery expertise, consult with fishers and assess the impacts of habitat modification, fragmentation and flow regulation on fishery productivity and biodiversity. A pre-project baseline is established against which future change is monitored.

D. Regulatory and governance

Regulations and project agreements for hydropower specifically address fisheries social and environmental impacts. Threatened species legislation exists, including provision to protect critical aquatic habitat areas and food chain species, and is enforced at local levels.



9.2 Management of impacts and fisheries resources

A. River basin planning

A basin-wide fisheries management framework exists and includes measures to promote fisheries productivity and regulate fishing activity. The effectiveness of management measures is monitored. Where reservoir fisheries are established, a framework exists for their management, monitoring and sustainable harvest.

C. Hydropower projects

Where feasible, siting and design measures and operational procedures are implemented to avoid and minimise fishery impacts. The effectiveness of mitigation measures is measured against baseline data and is publicly disclosed. Compensatory and off-set measures are deployed in the sub-basin to address losses in fishery productivity or biodiversity as a result of hydropower.

D. Regulatory and governance

Fishery plans regulations, catch limits, restricted fishing zones and other measures are enforced to protect fishery resources. EIA laws and regulations require fisheries impacts to be addressed and requirements for mitigation are included in hydropower project agreements. The effectiveness of fishery management and mitigation approaches and hydropower compliance with regulations is monitored by regulatory authorities.

TOPIC 9

Guidance Notes and Definitions

Examples of evidence; national fisheries policies and regulations, Basin fisheries policies and plans, EIA regulations for fish, Ecological and habitat assessments, Project EIA studies, Project feasibility studies, Optimisation studies, Hydropower design reports, Hydropower operational procedures and plans, Photographic evidence of dam structures, Project feasibility and optimisation studies, Fish conservation management plans, Environmental (and construction) management plans.

Design and operational provisions for fish management – includes fish passage structures; coordinated operations of cascades of dams; re-regulation of reservoirs; flexibility to modify dam operations in the future; reservoir fisheries and environmental releases to support habitat requirements.

Habitat modification – refers to changes in fish habitat. Examples include conversion of a stretch of river from a river channel to a reservoir, changes in deep pools and rapids; changes in food chain species, changes in flow and availability of nutrients.

Habitat fragmentation – in the context of hydropower refers to the barrier effect of dams on migratory species and sediment transport, or terrestrial habitat fragmentation caused by roads or transmission lines.



TOPIC 10

Dam and community safety

The intent of Topic 10 is that life, property and the environment are protected from the consequences of dam failure, dam operations and other hydropower related community safety risks across the basin.

Dams require careful design, construction and operation to ensure the safety and integrity of structures that can have catastrophic consequences upon failure. In particular, the application of standards and use of specialised and independent expertise is central to dam safety practices.

Dam safety standards must be adhered to in the design of structures and the effects of projects in a cascade need to be considered. The construction of dams to design specification needs to be systematically checked and documented and a baseline for monitoring future changes established. Safety risks at all stages of the project cycle must be monitored and appropriate action taken when issues arise. In addition to dam safety, community safety at different stages of the project cycle must also be considered.

Sudden releases of water from hydropower projects, for example, may cause accidents or loss of life or property downstream if appropriate warning and notification systems and emergency response systems are not in place.

The assessment will focus on the dam safety system in place for hydropower projects in the basin and how projects coordinate with each other to manage basin-wide safety risks. Emergency response planning to protect community safety relating to hydropower operations and associated infrastructure will also be assessed.

Evidence to be reviewed will include dam safety reports and studies, standards and guidelines applied in the basin, regulations and policies and the activities of institutions with roles and responsibility relating to dam and community safety.





Topic 10 has two sub-topics:

10.1 Dam safety

This sub-topic covers the technical aspects of dam safety from the design and construction stages through to operation and maintenance. It would include the application of design standards and regular monitoring of dam integrity and functioning of mechanical equipment, e.g. spillway gates.

10.2 Community safety and emergency response

This sub-topic covers the preparation, awareness and training of community safety plans and emergency responses. It also covers preparedness for changes in downstream flows during regular operations, e.g. during peaking. It covers warning systems and notifications issued by the company for downstream communities and river users.

Performance statements for Topic 9 Sub-topics and Criteria:

10.1 Dam safety

A. River basin planning

Dam owners, government agencies and water-users cooperate with each other to address basin-wide and cascade dam and community safety issues.

B. Energy / power sector planning and regulation

Energy planning and regulatory agencies mandate clear regulations and standards for dam safety at all project stages in laws, regulations and project agreements.

C. Hydropower projects

All hydropower projects in design, construction and operation stages have a systematic approach to dam safety risks and asset management that complies with mandated national and regional standards and includes review of independent expert panels. Dam owners report regularly on dam safety issues.

D. Regulatory and governance

Regulatory authorities enforce dam safety regulations consistently across the basin at all project stages including design and construction. There is ongoing monitoring and surveillance at all project stages and independent review panels review technical data. Action is taken to address non-compliances and issues that arise.



10.2 Community safety and emergency response

A. River basin planning

Integrated planning for emergency response, including sudden water release, flood, and other disasters exists amongst stakeholders in the river basin. Notification, warning and evacuation systems exist, are tested and are used in a timely manner. Flood risk analysis exists for the basin and includes hydropower assets and operational requirements.

B. Energy / power sector planning and regulation

Policies and standards exist for public safety issues associated with hydropower.

C. Hydropower projects

Hydropower procedures for water releases include provision for notification and warning systems, emergency response plans and the avoidance, mitigation and compensation for harm to life and property. There have been no major hydropower related community safety incidents in the basin.

D. Regulatory and governance

Regulations for emergency response plans and community safety plans for hydropower projects exist and are enforced. Government plans for emergency response including flood and disaster response exist and are tested. Laws and regulations include provision for compensation for damage to life and property and are enforced. Emergency response plans are regularly tested with provincial and local police and emergency crews.





TOPIC 10

Guidance Notes and Definitions

Examples of evidence - Dam Safety Management System documentation; dam safety risk assessment reports independent auditing and monitoring reports; integrated dam safety risk assessment reports; emergency Preparation Plan (EPP); integrated EPP for the basin, training programs, community awareness programs dam break analysis reports for projects in a cascade; national and regional emergency flood management plans and policies.

Safety considerations at different stages of development

Design stage - In the asset design, adherence with safety standards and the expertise used in the design team to address various safety issues is an important consideration. Specialists should include: engineering geologists, seismic experts, civil engineers, dam safety specialists, mechanical and electrical engineers and the use of independent expert review. The design stage should include identification of all potential failure points in the dam, power station and associated infrastructure, and identify design and operational strategies to manage risks. There should be consideration of risks associated with other projects in a cascade and other events in the basin such as flood events.

Construction stage - During the construction stage, infrastructure safety issues include quality control processes to ensure infrastructure is constructed to design standards, flooding risks associated with temporary diversion and storage structures; construction related safety issues and the establishment of a monitoring baseline.

Operation stage - During the operation stage the focus will be on the systematic and routine monitoring and surveillance of infrastructure to ensure it achieves safety objectives, as well as the emergency response processes that are in place. An important consideration is a systematic approach to risk management and response to issues that are identified. Public safety measures around infrastructure such as barriers and signage are also an important consideration.

Dam (Infrastructure) Safety Management System

- Hydropower developers and operators should have a systematic approach to infrastructure safety issues that meets required standards and includes associated infrastructure (e.g. power stations, transmission lines, roads, reservoirs). This is usually called a Dam (Infrastructure) Safety Management System and should be in place for all stages of development and include: (i) an emergency preparedness plan, (ii) construction supervision, instrument and quality assurance plans during construction, (iii) an operation and maintenance plan and safety monitoring and risk management system (iv) independent expert review, (v) dam break analysis for cascades and (vi) consideration of downstream safety risks such as drowning risks and property damage.

Emergency Plan - An Emergency Plan should include; public safety 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.



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 rich 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.

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

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

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.

River 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.

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 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.

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.

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).

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.

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 in 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 – the passing of sediment trapped upstream of a dam to the downstream environment.

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.

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 3: RSAT ASSESSMENT GUIDE

PART 3:
RSAT ASSESSMENT GUIDE





Assessment Guide Introduction

The RSAT Assessment Guide describes the typical process for an RSAT assessment or dialogue. This section contains basic advice, information and preliminary resources required to establish, prepare for and conduct an RSAT assessment. Different applications may require variations in the basic process, as illustrated in the How-To Guide (Part 4). The RSAT Toolbox (Part 5) provides additional resources, detailed assessment preparation checklists and templates, training materials, community user's guide etc, and other checklists and tools on the RSAT will be posted on the MRC website¹.

There are typically five stages of an RSAT assessment. This Assessment Guide provides information and guidance on each stage of the assessment.

- Establishment stage
- Preparation stage
- Assessment stage
- Reporting stage
- Follow-up stage

¹ Visit - <http://www.mrcmekong.org/>

RSAT Establishment Stage

The need for doing an RSAT assessment needs to be clearly defined at the outset, and this will lead to clear objectives for the assessment. In addition, various stakeholder groups need to be involved either directly to participate in the assessment or indirectly to provide access to data and information and support the overall process. The establishment stage is mainly concerned with communication about the RSAT process and engagement with key stakeholder groups for the target sub-basin to gain support for the assessment. Funding and resourcing also needs to be confirmed and a lead institution nominated to coordinate the process.

The checklist below can be used by the lead institution or organization(s) that wish to conduct RSAT assessment during the establishment stage to clarify the rationale for the assessment and to identify key stakeholder groups to be involved in the assessment and data sources.



**TABLE 2: RSAT ESTABLISHMENT CHECKLIST**

	Establishment stage checklist	
Purpose	Why conduct an RSAT assessment in the basin?	
	What is the desired outcome of an RSAT assessment in the basin?	
	Make a list of possible objectives for the assessment.	
Scope	What hydropower development (planned, committed and operational) is there in the basin? Is information on the hydropower projects available and how can hydropower developers be involved in the process?	
	What are some of the key hydropower sustainability issues in the basin?	
	Is the basin shared between two or more countries?	
	Does the basin have an RBO or RBC or is there a plan to form one?	
	How many provinces and districts share the basin?	
Sectors	Which are the key agencies (national and provincial) with responsibility for energy and water planning in the basin?	
	Which are the key agencies (national and provincial) with responsibility for environmental, social and economic planning in the basin?	
	What are the important sectors in the basin (e.g. fishing, agriculture, industry, energy)?	
	Are there local water-user groups or equivalent active in the basin?	
	Are their universities, research centres, NGO's or donors working in the basin?	
Participants	Conduct a stakeholder analysis to determine the key stakeholder groups in the basin for IWRM and hydropower development.	
	Who are the key stakeholders to include in the assessment and why?	
	How well established are the working relationships amongst the stakeholder groups to be involved in the assessment?	
Sources of information	What other studies have been completed that relate to IWRM and hydropower development?	
	What are the key data sources and how can data be accessed?	
Organisation of RSAT	Is funding available for the assessment?	
	Which institution or group will coordinate the assessment process?	
	What are the risks for conducting the assessment?	

A lead institution or group with the resources and capacity to coordinate the RSAT assessment process will need to:

- Provide the overall rationale, type of assessment needed, and expected outcomes;
- Provide funding and logistical support;
- Access stakeholders and data and information for the assessment;
- Appoint resources to conduct assessment preparation and facilitation tasks;
- Bring participants to participate and provide data and other inputs; and
- Plan for a follow-up process for actions and issues identified during the assessment.



RSAT Preparation Stage

The preparation stage is a critical stage in the RSAT assessment process and is the most time consuming stage. The preparation stage involves preliminary research on the basin and hydropower development to establish the key issues, stakeholders, objectives and methods for the assessment. Once objectives are established, detailed data will be collected for each topic. Data can be collected by data collectors over a period of two to four weeks or longer depending on the availability of data and the complexity of the basin and development context. The tasks in the preparation stage may be conducted by an individual or assessment preparation team members who share responsibility for different tasks.

Preparation of the assessment consists of the following tasks:

- Definition of the scope of the assessment and identification of priority issues for the basin
- Appointment of human resources to prepare for the assessment
- Decisions on how the assessment will be conducted and methodologies to be used
- Definition of the expected outcomes, reporting requirements and responsibility for follow-up actions
- Selection of assessment participants and appointment of a facilitator
- Identification of key data sources for each

topic and key stakeholder groups with data and information to contribute to the assessment

- Collection of information and data
- Preparing the presentation of data and information for each topic, including preliminary gap analysis using assessment templates
- Organise a field visit to the sub-basin as part of the assessment
- Liaison with hosts/relevant organisations to gain permissions, access and support
- Logistical preparation – venue, dates, field visit, invitations, communications 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. An assessment preparation team can complete the assessment preparation stage tasks over a period of two to four weeks depending on the availability of data and information.





Preliminary planning for the assessment

Below is a checklist that can be used to provide guidance to the assessment preparation team or individual in preparing for the assessment.

TABLE 3: ASSESSMENT PLANNING AND PREPARATION CHECKLIST TO IDENTIFY OBJECTIVES

About the assessment	
Statement of the scope of the assessment – which basin and program of hydropower development is being assessed?	
What are the expected outcomes of the assessment?	
What will the results of the assessment be used for?	
Who will form the assessment panel and who will facilitate the assessment?	
What is the main priority for the lead institution for the assessment?	
How can different levels of governance from local to national be represented?	
What other studies, projects or initiatives exist in the basin that are relevant to the assessment? Can the assessment be linked to these other initiatives?	
About the basin	
Gather a list of hydropower projects, developers and operators (existing, proposed, under construction) for the basin.	
Is there a river basin plan or IWRM plan for the basin being assessed? How can the RSAT assessment support the objectives of the plan?	
What are the priority issues for the basin, based on preliminary desktop research?	
How will information on all relevant national and transboundary agreements, policies, legislation, standards and regulations for the basin be gathered? Is this information available?	
Is the basin 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?	
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 preparation 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?	
Assessment outcomes and outputs	
Who will be responsible for reporting on the assessment results and who will they be reported to?	
Where will the information from the assessment be stored and who will need access to the information?	
Who will be responsible for the assessment and the follow-up actions from the assessment?	

Completing the above checklist will assist to identify the key issues and data sources in the basin and to understand the stakeholder environment. A range of resources, templates and detailed training and guidance is available to assist the assessment preparation team to prepare for the assessment.



Identifying priority issues for the basin

It is recommended that the assessment preparation team conduct preliminary desk research on the sub-basin to identify the priority issues for the basin. The assessment preparation team can conduct preliminary web research or consult with local stakeholders or basin experts depending on what information is available. Understanding the priority issues will assist to form clear objectives for the assessment. For example, it may be that a key issue in a particular basin is the issue of hydropower and flood management practices in the basin. In this case, the data collection effort on these issues can be increased to ensure there is adequate information, and representation on these issues for the assessment or assessment objectives may be set to focus more attention on the key issues.

Selecting assessment objectives and methodologies

The objectives for the assessment need to be agreed upon by the assessment participants and lead institution prior to the commencement of the assessment. It is recommended that a preliminary briefing be provided to the RSAT assessment participants prior to the commencement of the assessment to ensure that participants understand the process and agree on assessment objectives. If a pre-assessment briefing is not possible, then the setting of assessment objectives should be discussed in the opening of the assessment workshop so that participants can agree on objectives prior to commencement of the assessment. After filling in the above checklists, the assessment preparation team will have developed some potential objectives for the assessment. Examples of assessment objectives are given below:

Examples of RSAT assessment objectives:

- To identify gaps in data, regulatory frameworks, institutions and on-the-ground practices
- To identify the development risks, opportunities and priority issues in the basin within a structured framework
- To inform the scope of cumulative and strategic impact assessment studies
- To inform studies to optimise development outcomes in a sub-basin
- To assist river basin organisations to engage in the hydropower planning and management process and develop action plans based on identified priorities
- To assist water and energy planners to identify needs and opportunities for collaboration and coordination
- To inform the development of a watershed management strategy in a hydropower sub-basin
- To monitor hydropower sustainability performance in a sub-basin
- To establish dialogue and collaboration between different hydropower and river basin stakeholders
- To conduct capacity building or training in hydropower sustainability or IWRM
- To assess transboundary arrangements for hydropower development

Stakeholder analysis and selection of assessment participants

The RSAT is designed to facilitate structured dialogue between key stakeholder groups for basin-wide hydropower sustainability. During the assessment establishment and preparation stage, a stakeholder analysis should be conducted to identify key stakeholder groups for IWRM and hydropower development in the basin and their pre-assessment level of interaction with each other. The objectives for the assessment should be developed in



consultation with key stakeholder groups for the basin. The key stakeholder groups in the basin may have well established communication channels and working relationships or they may have little interaction with each other. There may also be tension or conflict between some key stakeholder groups in the basin. Building collaborative relationships amongst key stakeholder groups is a long-term process for IWRM and a staged approach may be needed to bring different groups together for multi-stakeholder RSAT assessments.

Assessment participants should be selected to support assessment objectives and should represent different areas of responsibility and interests at different levels from local to national. Stakeholder groups can work together in a multi-stakeholder assessment approach or they may work separately initially in order to build trust and understanding of the

process before they come together in a multi-stakeholder context. Some groups may need training or support to understand the technical aspects of the RSAT before they can engage in an RSAT assessment process, in which case a capacity building or training program can be included in the assessment approach. The selection of assessment approaches and participants needs to be flexible and will be driven by the development context for the basin and the existing stakeholder environment and level of capacity.

Figure 5 shows a stakeholder analysis prepared for engagement of different stakeholders in the RSAT development strategy. This covers most of the major stakeholder groups that might be included in an RSAT Assessment. The original purpose of this analysis was to develop objectives for engagement with the different stakeholders in a basin with the RSAT process.

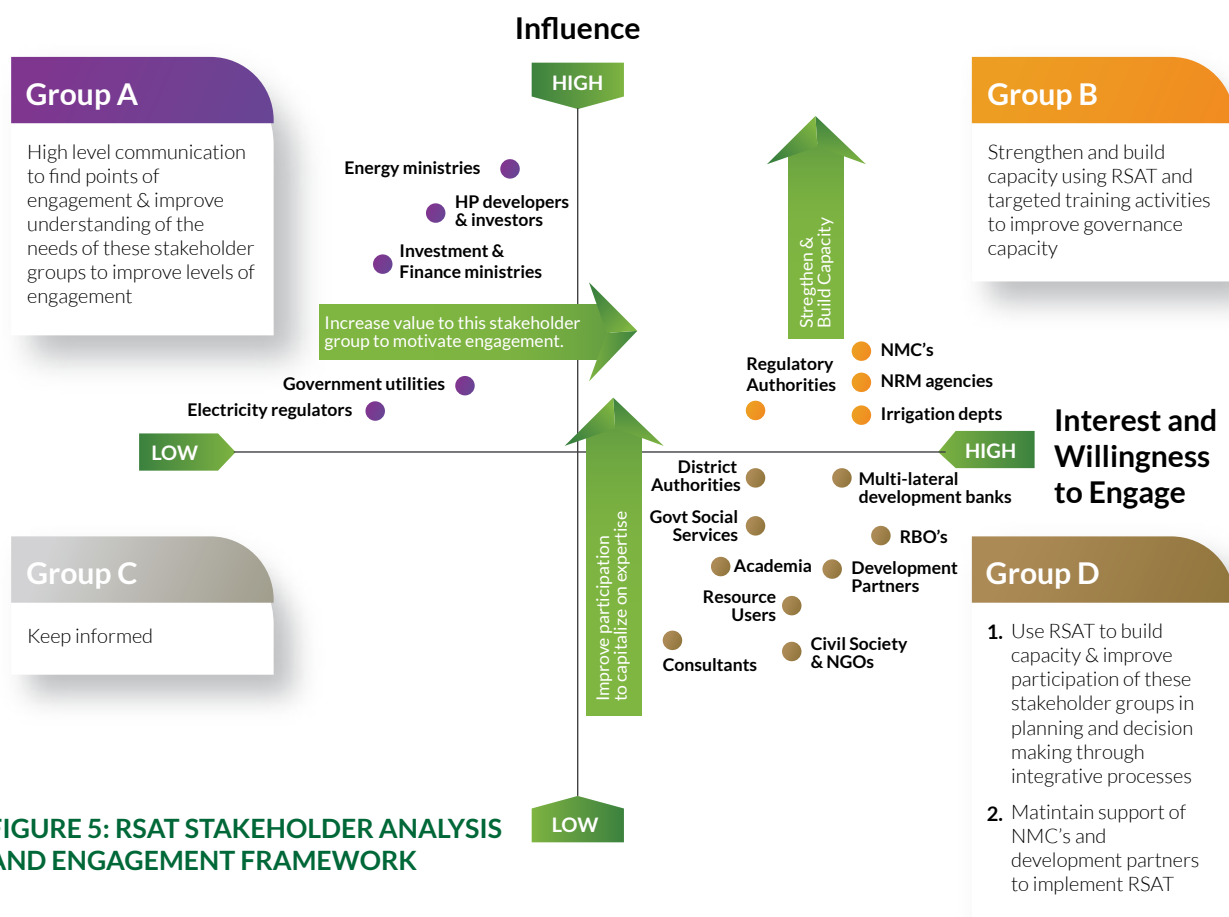


FIGURE 5: RSAT STAKEHOLDER ANALYSIS AND ENGAGEMENT FRAMEWORK



In sub-basins where multi-stakeholder assessments are planned, participants should include representation of different groups and interests in the basin. It is essential that participants have local knowledge and experience working in the basin. For example, a representative from a hydropower company should be a senior technical staff member that is working in the sub-basin and understands the details of the projects and operating environment. Government representatives should include staff that have worked in the basin or been directly involved in the various studies related to IWRM and hydropower development in the basin. The optimum number of assessment participants is considered to be 10-15 people, supported by a facilitator and data collector(s).

As hydropower sustainability requires expertise across a range of disciplines, the assessment will require inputs from a number of people with appropriate expertise and/or local knowledge of the basin and hydropower projects. An RSAT assessment should include either inputs or participation from the following stakeholder groups to ensure a diversity of interests and appropriate expertise contributes to the assessment:

- Representatives from different institutions at different levels with key responsibilities in the basin (e.g. government agencies, river basin organisations, other key sectors in the basin)
- People with local basin knowledge and experience with on-ground practices in the basin
- Social, environmental and economic experts with knowledge, experience and / or responsibility for activities in the basin
- Engineering and technical expertise in hydropower and dams in the basin and representatives from hydropower projects
- Representatives of local water-user

groups and other natural resource management community groups in the basin

- Representatives with knowledge of specific historical information about hydropower and development in the basin
- Academic institutions or NGO's conducting work in the basin

For a multi-stakeholder assessment process to deliver objective outcomes, a balance of representation from different stakeholder groups and interests, supported by good quality and independent facilitation is required.

Selection of assessment methodologies

Once the objective of the assessment is defined and the participants are selected, the assessment preparation team will develop an assessment approach and methodology. As mentioned above, the assessment approach may include a capacity building or training program to improve the level of technical understanding of hydropower sustainability issues and the RSAT process among participants.

Selection of a facilitator

For multi-stakeholder RSAT assessments it is recommended that a facilitator be appointed to facilitate the group assessment process. The facilitator plays a critical role in an RSAT assessment and should therefore be carefully selected and appropriately qualified. The facilitator may also be involved in data collection for the assessment and may or may not be the person to present the evidence to the assessment participants. The facilitator should be independent and should not have a particular vested interest in the assessment or the hydropower or water resource development in the river basin. It is helpful however if the facilitator has knowledge of the



basin so that s/he can question participants to draw out additional information. The facilitator should be suitably qualified to manage multi-stakeholder group dynamics to ensure that all panel members have the opportunity to participate in the assessment.

An RSAT facilitator training programme is under development for nationals of the Mekong countries, so that trained facilitators will be available to lead and facilitate the different RSAT applications.

Planning a field visit to the basin

If time and resources allow, it is beneficial for the assessment preparation team to visit the basin to inform planning and the identification of important issues and also to collect local level data and information through interviews with relevant local stakeholders.

The venue for the RSAT assessment should be located in the river basin and a site visit to the basin is recommended that could include:

- Hydropower projects and related infrastructure
- Proposed project sites
- Resettlement communities and a tour of the key basin activities, sectors and land uses
- Communities and areas downstream of dams and hydropower reservoirs
- Other areas of interest that relate to the assessment objectives or the key issues for the basin

The field visit to the basin is an important aspect of an RSAT assessment to ensure participants have an on-ground understanding of the basin. The field visit also strengthens working relations among participants which may be important for Follow-up after the assessment.

Institutional mapping in the preparation stage

As part of the preparatory stage, a basic institutional analysis should be developed to map regulatory and governance institutions, roles and responsibilities for hydropower sustainability in the basin at different levels. A more comprehensive institutional analysis which focuses on the interactions between various institutions can also be conducted if time and resources allow. Institutional analysis is also one assessment methodology that can be used during the assessment. Institutional analysis is an important assessment preparation task as it provides an understanding of the key institutions, policies, plans, roles and responsibilities at different levels and helps to identify gaps. An institutional analysis table for each topic is provided in Part 5, RSAT Toolbox.

Consideration of different levels of governance in RSAT assessments

Different levels of governance include international cooperation for river basins shared between countries (e.g. the Mekong River Commission), National (e.g. national laws and policies), Provincial and the various local formal and informal institutions (e.g. water-user groups and local resource allocation systems) at the local scale. The RSAT includes aspects of basin-wide hydropower sustainability at all levels.

Table 4 uses the RSAT criteria and gives examples to demonstrate the dynamic nature of different levels of governance for hydropower development. This table can be used to complete the information in more detail for the assessment and can be adapted to meet different needs. Understanding different institutions with responsibilities at different

levels will improve the quality of the dialogue process and risk assessment. The RSAT is designed to focus attention on the interaction between different levels of governance with the aim of making hydropower more sustainable in the basin. The table below can be adapted to enable more complex analysis if time and resources permit.

TABLE 4: INSTITUTIONAL MAPPING FOR RSAT ASSESSMENT

Governance institutions	
A. River basin planning	
International	International River Basin Organisation (e.g. MRC), international donors, investors and NGO's
National	National water resource agencies, social planning agencies, economic planning agencies, national investors, etc.
Provincial	Provincial water resource agencies, regional office of national agencies, fisheries agencies, social sector, agricultural etc.
Local	District administration, local water-user groups, fishing groups etc.
B. Energy planning	
International	International Energy Planning Organisation (e.g. GMS), international donors, investors and NGO's
National	National energy agency, national investors, agencies across other sectors
Provincial	Provincial energy agencies and regional offices of national agencies, private and public electricity suppliers etc.
Local	Local off grid electricity providers and consumers
C. Hydropower projects	
International	Large transboundary projects and export projects, integrated power trading systems
National	Large nationally significant projects
Provincial	All projects small to large scale
Local	All projects and micro-scale local projects
D. Regulatory and governance	
International	International agreements, conventions and institutions, international donors
National	National law, policies, regulations, administrative bureaucracies, national plans
Provincial	Provincial law, policies, regulations, administrative bureaucracies, provincial plans
Local	District administration, village administration, community level rules, norms, social relations, kinship relations, and on ground practices. Organised community groups and resource user groups.



Selecting a river basin scale for the assessment

The assessment preparation team will also decide which scale of river basin to assess. It may be more effective to conduct the assessment in a smaller second order tributary sub-basin, for example, to enable closer assessment of local level issues associated with hydropower as opposed to a larger basin where a more generalised or higher level assessment can be conducted.

The task of collecting sufficient data for a large basin is a lot more complex than for a small watershed, although data availability for a small watershed may be limited depending on what projects and studies have been conducted. Transboundary river basins will require cooperation and participation of representatives from both countries and data gathering in both countries. The assessment preparation team should select the scale of river basin that matches the objectives of the assessment and the time and resources available for data gathering if large and complex basins are selected.

Assessing basins with projects at different stages of development

The RSAT is designed to assess a basin which may have multiple projects, at different stages of development (options assessment, project siting and design, preparation, construction and operation). The performance statements have been designed to cater for projects at all the different stages. 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. It is the role of the facilitator to ensure that the performance statements are interpreted in a way that suits the development

context and project development stages in the basin.

If all projects in the basin are at the same stage of development, then the performance statements that relate to the other stages will not be relevant.

Advice on data collection

The evidence used for an RSAT assessment is secondary data and information such as reports, studies and regulations. The RSAT assessment process is designed as a rapid process and therefore does not generally include analysis of primary scientific data. The type of evidence required is usually that the processes, impact studies, management and monitoring measures have been carried out and regulations required for sustainable management of hydropower are in place and being complied with. An assessment of technical data is not required, since this is generally beyond the interests and capacity of the participants.

Data sets for RSAT assessments can be very complex and cumbersome to collect if the data collection process is not properly managed. The aim is not to collect large amounts of generalised data but to find specific and targeted information to address the performance statements in each criterion. It is important therefore for the data collectors to understand the specific information that is required to match the topics and criteria and the objectives of the assessment to reduce the overall data collection effort and provide more targeted and useful information to the RSAT assessment.

If the hydropower projects in the basin are all at one stage of development (e.g. operations stage), then the data gathering effort will focus only on collecting the information from the



performance statements that is relevant to that stage of the development. This will simplify the data gathering process. The data collection should also be informed by an understanding of the important issues for the basin and the objectives of the assessment. For example, if the objective of the assessment is to assess transboundary issues, then the data collection effort will be focused on information at the national and international level.

It is important to collect specific information. For example, if a performance statement refers to the enforcement of regulations, then the data collector must find some evidence that the regulations are enforced. The regulations in this case do not form adequate evidence on their own because the performance statement is specifically asking for evidence that they are enforced. Evidence to demonstrate this may be a compliance report or evidence that government agency staff carry out inspections of projects to check compliance.

One of the outcomes of the assessment is to identify the gaps in information, data, policies etc. in a river basin. The assessment preparation team should decide how much time to allocate to the information gathering stage based on the resources available, and collect as much specific and relevant 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. In addition, all participants will bring their own knowledge and expertise to the discussions and may be able to fill some of the information gaps.

Two tools for targeting the information gathering are described in Part 5.

How to present evidence for an RSAT assessment

Once the evidence is gathered, it is organised into each sub-topic and criteria so that it can be presented to the assessment participants during the assessment. Templates are available to assist the presentation of assessment data. A summary handout of data is prepared for the assessment participants and a summary PowerPoint presentation for each topic is prepared to present the evidence and the results of the preliminary gap analysis conducted during the data gathering stage for each topic. The sources of evidence should be collated into a bibliography (to be included in the report) and the most relevant data made available to the participants where possible to review during the assessment.

Interview schedule for assessment

One source of data is interviews of selected experts with knowledge, experience and /or responsibility for activities in the basin. The assessment preparation team should identify suitable people for interview and develop an interview schedule. It is important for the assessment preparation team to understand the specific information that is required from interviewees and the Topic Checklists and performance statements should be used for this purpose. A table in Part 5 can be used as a record of who was interviewed for the assessment, and should be attached to the assessment report as an appendix.



RSAT Assessment Stage

During the assessment stage, the group assessment process takes place over a period of approximately five days, either in a one-week block or split into two or more sessions depending on logistical considerations. It is noted that the assessment or dialogue process can be quite intense, and sometimes covers similar ground depending upon the topics chosen. At least half a day per topic should be allowed when planning the meeting. It is also recommended that the RSAT assessment include a field visit to the basin, since this provides a reality check on the context of the basin for the participants.

The basic structure of an RSAT assessment is a group workshop that is led by a dedicated facilitator. All of the assessment activities and methodologies are applied within the five-day workshop. The facilitator will plan the activities based on the time available and methods to be used.

The agenda for a typical RSAT assessment might consist of the following:

- **Session 1:** Introductions and agreement of the objectives for the RSAT assessment and the process to be followed
- **Session 2:** Overview of the river basin, the issues relating to sustainable hydropower and the stakeholder groups and institutions involved
- **Session 3:** Topic discussions
 - Introduction to Topic A, what does it cover, what are the sustainability issues to be considered
 - Summary of the evidence provided by the research/data collection team – gap analysis against performance statements

- Participant discussion about the issues relevant to the topic and context in the river basin, using tools such as SWOT, problem tree analysis etc.
- Development of actions that are needed to improve the sustainability of hydropower development in the basin
- Refinement of specific actions that the participants and the organisations that they represent can take – SMART actions

■ **Session 4 and Further sessions** for other Topic discussions

■ **Final Session:** Summing up, review of actions developed for all topics, reporting and follow-up – which agencies should the recommendations for action be taken to, by whom, and by when – agreement to meet again to review achievement of actions taken. The RSAT action planning Worksheet is included in Part 5 RSAT Toolbox.

Level of assessment

The most detailed level of assessment is when each topic is considered by each sub-topic from the point of view of each of the criteria (River basin planning, Energy planning, Hydropower projects, Regulatory and governance). This can be time consuming and require a lot of effort on the part of the participants, and it is entirely acceptable to limit the level of assessment in the following ways:

- Select the key topics that are seen as most important for the basin. Whilst an assessment of all 10 topics is considered important for full coverage of the issues, some may be less pressing than others.
- Select the sub-topics that are most relevant – for example in a basin within one country it may not be necessary to consider transboundary sub-topics
- If you have a larger group, it is possible to split into smaller groups to address



different sub-topics or criteria. There would then have to be a report-back session on the findings of each group

- Review the topic and sub-topic at the overall level, without assessing the four criteria separately
- If you find that you have already discussed some issues under another topic, note this and move on to discussions of other issues
- Filter the wish list of recommendations to develop a few action points that can be undertaken by the participants or their organisations

Selection of assessment methods

The core assessment methodologies that are used to complete an RSAT assessment are described in the RSAT Toolbox in Part 5 and more detailed guides and templates are downloadable on-line to assist users. This is just a menu of participatory assessment and dialogue methods; there is no one method which must be used, and it is the task of the facilitator and preparatory team to decide what method is most suitable for these participants in the time and resources available.

Examples of assessment methods include:

- Institutional mapping and gap analysis
- SWOT analysis
- Problem tree analysis, Fish bone analysis
- Multi-criteria gap analysis
- Action planning

Developing the recommendations

It is important that each RSAT assessment, whatever its objectives, comes up with a series of recommendations for action to improve the sustainability of hydropower development within the river basin. These recommendations need to be SMART² with well-defined, achievable actions indicating who (which organisation) will take them, and when will they be completed. One way to prevent the recommendations from becoming a wish list of actions that should be taken, is to ask participants to develop those actions that they or their organisations can realistically undertake by themselves within a reasonable time frame. These may be quite simple, small steps towards increasing sustainability of hydropower in the basin. Examples are given in Part 5.



RSAT reporting

After the assessment is complete, a report is prepared to present the results of the assessment. The report should be formally presented to the senior level planners and decision makers with key responsibilities in the sub-basin to gain endorsement and high level support for recommended Follow-up actions.

Templates are available to assist report preparation and ensure a consistent approach. The results are presented for each topic and the report includes a summary of the assessment process and recommendations for follow-up actions. The key forms listed below are the forms that have to be filled out during the assessment and included as appendices to the report. The following forms are available electronically for the assessment panel to use:

- Assessment Information Sheet
- Completed data collection templates for each topic
- Topic assessment and summary sheet for Topics 1-10
- Evidence register
- The Evidence and Interviewee list

RSAT Follow-up

The lead institution that establishes and coordinates the RSAT assessment will also establish responsibilities for follow-up actions amongst the key stakeholder groups involved in the assessment. The plan for follow-up activities should be included in each topic assessment and summarised in the conclusion section of the RSAT assessment report. Follow-up actions should include a repeat RSAT assessment after a nominated period of time (e.g. 12 months) to track progress. Ideally the first RSAT assessment is seen as the start of a series of repeat assessments to follow the progress of recommendations with the same participants.





PART 4: RSAT Applications- “How to” Guides

Applications for RSAT

RSAT is an open access dialogue tool. It is flexible and can be used in several ways. This means that it can be used by different organisations and groups and adapted to their needs and objectives. This section describes some of the different uses that have been tried or envisaged, and matches them with the type of organisation that could potentially use them.

At the end of the section some “How-to Guides” provide brief descriptions of how RSAT may be used in different applications.

Different uses for RSAT

Some of the different uses for RSAT that have been tried or envisaged include:

■ Raising awareness about sustainable hydropower

This has often been one of the main objectives during the trials and pilot assessments to date. Participants are exposed through both the specific information provided on each topic and in the discussions around the performance statements which illustrate good practice in making hydropower development more sustainable. Attitudes towards hydropower differ and questions about how it can be made more sustainable are raised, especially in a country such as Myanmar, where hydropower projects have been highly criticised.

■ Stakeholder and public consultation

RSAT may be used as a framework for discussion in public consultation about a

particular hydropower project at whatever stage – design, construction and operation. The RSAT topics allow a more focused discussion to take place, and for actions to be identified for addressing the issues that are of most concern to the stakeholders. A large public consultation may not be suitable for a detailed dialogue such as has been described earlier, but this could be arranged with a smaller group of representatives of the stakeholder groups.

■ During EIAs, SEAs and CIAs

Stakeholder and public consultation is a fundamental part of the environmental and social impact assessment process, and RSAT can provide a framework for presenting the different topics for discussion at such consultations. The EIA reports require evidence of the consultation process, and the RSAT dialogue report can provide such evidence. The RSAT framework can also provide the consultants developing the impact assessments with a framework for analysis and reporting.

■ Hydropower risk assessment

Investors in hydropower need to be aware of the risks involved, including the extent to which a project and the basin it is to be built in is compliant with the sustainability performance statements. The gap analysis for each of the topics can highlight risks for a new hydropower project and help to identify the actions necessary to manage those risks.

■ Providing a comprehensive framework for analysis of sustainable hydropower in a river basin

RSAT complements other IWRM tools that may be used for river basin management in basins where hydropower is being developed. The strength of RSAT is its focus on hydropower sustainability, and while it can be used in basins where there are other reservoirs, e.g. for irrigation and water supply, it does really only provide specific analysis for



hydropower. The topics and sub-topics cover all of the sustainability issues, and RSAT may be used for systematic analysis to identify priorities for both Environmental and Social Management planning, and for river basin or watershed management planning.

■ **Developing strategies for action and advocacy**

Organisations may use RSAT internally to develop their strategies towards hydropower development, allowing them to use RSAT to help focus the principles and priorities for their action. In such an application the organisation considers the different topics through the lens of its own mandate and objectives, and helps it to identify where and how it should focus its work. It has been used with new River Basin Organisations to identify priority actions for sustainable hydropower in the basin, and NGOs and Civil Society Organisations have used it to develop their advocacy and funding strategies for increased sustainability of a particular hydropower project. The advantage of carrying out an RSAT assessment for one organisation, is that the action plans can be very specific.

■ **Capacity-needs assessment of an organisation**

As with developing strategies for action, an RSAT assessment may be used within an organisation using the topics to identify the capacity needs for management of sustainable hydropower. Typical organisations where such a capacity-needs assessment RSAT could be carried out include RBOs and agencies regulating hydropower.

■ **Transboundary dialogue – hydro-diplomacy**

RSAT is considered to be an excellent tool for hydro-diplomacy. When used in the context of a shared river basin, RSAT can provide a framework for dialogue between the two countries helping them to identify common issues and concerns and work towards solutions. As such it can pre-empt water-use conflicts across borders.

What RSAT cannot be used for

Although RSAT is an extremely useful dialogue and assessment tool, it cannot replace the formal and legal processes of impact assessments for hydropower – Environmental Impact Assessment, Cumulative Impact Assessment and Strategic Environmental Assessment. It is however, a tool that can be used alongside these processes to engage and consult with stakeholders.

Similarly, the RSAT is not a technical tool to be used for design and operations of hydropower plants, and it cannot be used to guide the site selection process or in optimisation of hydropower plants in a cascade.

Another of the limitations of the RSAT is that it is not set up to ask critical questions, such as the effectiveness of implementation of policies or the compliance with and enforcement of regulations. It is possible that questions of effectiveness and compliance could be included in dialogues if the participants have developed experience of its use and are part of an ongoing programme of RSAT dialogues in a basin.

RSAT is also not designed to be used as a sustainability audit of hydropower. This is the main objective of the Hydropower Sustainability Assessment Protocol, which has been established to carry out such sustainability audits. It is noted below, that an RSAT assessment could complement an application of the Protocol for a hydropower project in its basin.

Different users

A number of different organisations and groups may wish to use RSAT and take the lead in an RSAT assessment. These are summarised in **Figure 6** and include:

Government line agencies and Ministries,

such as Power sector planners, Hydropower regulators, Ministry of Environment and Natural Resources, departments for EIA and environmental quality and departments of water resources. These agencies may wish to use RSAT for:

- Scoping of issues for sustainable hydropower
- Performance monitoring
- Gap analysis
- Basin/cascade optimisation
- In power development planning
- Performance monitoring
- Gap analysis
- As a framework for review of feasibility studies and EIAs

River Basin Organisations (RBO's) and their consultants in Integrated Water Resource Management can use RSAT for development of action plans for the RBO to:

- Support RBO establishment and management
- Engage with RBO stakeholder/water-user dialogues
- Capacity building needs assessment
- Basin hydropower status reports
- Environmental and social monitoring

Hydropower developers, plant operators

and their consultants can use the RSAT at any stage in the development of a plant. It can be used internally within the company to focus on specific sustainability issues, or as part of a wider stakeholder engagement process.

- Risk assessment
- Design and siting
- Sustainability optimisation
- Stakeholder engagement and dialogue
- Framework for sustainability analysis in EIAs, CIAs etc.
- Environment and Watershed management planning framework

Banks and investors can use RSAT as a framework for ensuring sustainability during due diligence of proposed investment projects in a river basin. It can be used for investment risk evaluation, including financial and reputational risk assessment. The RSAT process can highlight safeguard policy requirements and ensure compliance.

Provincial and local institutions, NGOs and community groups

may be one of the main users as well as being important stakeholders within a basin. The application of the RSAT dialogue can raise awareness about what to expect in a hydropower project that aims to be more sustainable, and to advocate for developing hydropower projects to take the necessary steps towards this aim. The RSAT process will identify and allow discussion of the risks and opportunities for local and provincial groups arising from a hydropower project, leading towards assessment of benefit sharing arrangements. The process will increase local capacity for sustainable development, and identify the actions that can be taken by the communities and the NGOs that work with them.

Figure 6: Benefits of RSAT use for different Stakeholder



TABLE 5: SHOWS THE POTENTIAL INTEREST IN RSAT APPLICATIONS OF DIFFERENT ORGANISATIONS

USER	Raising awareness	Public/ Stakeholder consultation	identification of issues	Strategies for action	Plan of action	Advocacy strategies	Capacity needs assessment	Framework for analysis	Risk assessment	Transboundary dialogue
MRC	X	X	X	X	X	X	X	X	X	X
WWF	X	X				X				
ADB	X	X				X		X	X	
RBOs	X	X		X	X		X	X		X
Power sector planners			X	X	X		X	X	X	
Hydropower regulators		X		X	X			X	X	
Hydropower project developers & operators		X	X		X			X	X	
Hydropower environmental and social consultants		X	X		X		X	X	X	X
IWRM consultants		X	X	X	X		X	X	X	X
Development agencies		X	X	X	X	X	X	X	X	
Banks and financing agencies		X		X	X			X	X	
NGOs	X	X	X		X	X	X	X		X
Affected communities	X	X	X		X		X			



How-To Guides

A number of different “How-to” guides illustrate how RSAT may be used. These are shown in Figure 7 below and Table 6 summarises some of the main ideas for the different ways RSAT can be used. These are supported by guidance on these applications in the RSAT “How To” Guides, which make up the remainder of Part 4.

FIGURE 7: POSSIBLE RSAT APPLICATIONS

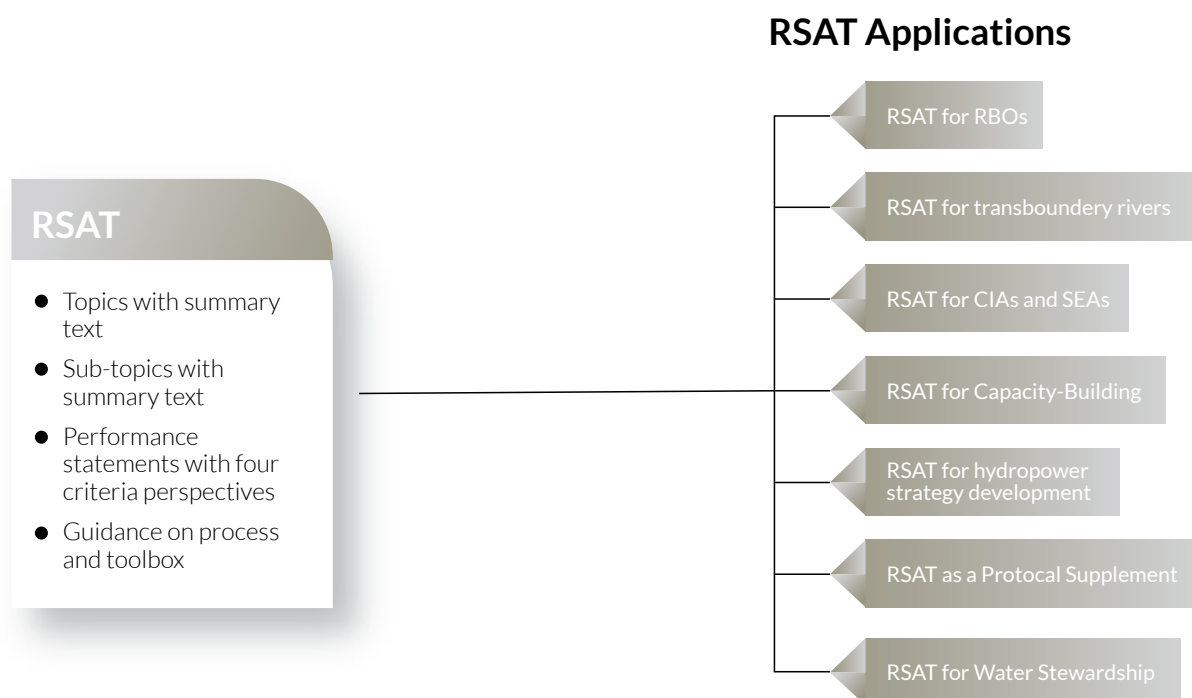


TABLE 6: SUMMARY OF DIFFERENT APPROACHES FOR RSAT USE

RSAT OPPORTUNITIES	RSAT for RBOs	RSAT for Transboundary rivers	RSAT for CIAs and SEAs	RSAT for capacity-building	RSAT as a Protocol supplement	RSAT for water stewardship
Purpose	To provide a structured guide to identify and address key sustainability issues in a hydropower-intensive river basin over time	To provide a framework for dialogue between countries sharing a transboundary river to improve management of hydropower development	To demonstrate a participatory and multi-stakeholder process of consideration of key cumulative and strategic issues in a hydropower-intensive river basin	To support structured capacity-building on the key sustainability topics requiring attention in hydropower-intensive river basins	To enable consideration of findings of Protocol assessments of hydropower schemes in a river basin and identify actions for Follow-up	To identify and evaluate areas of shared risk for water-reliant industries in a hydropower intensive river basin
Method of Application	Ongoing series of workshops, internal basin focus, actions committed to by workshop participants, small steps are fine, Follow-up and continuity are critical	Ongoing series of workshops, transboundary basin focus, identification of common issues and development of shared solutions	One or several workshops run by independent consultants to value add to CIA / SEA assessments by obtaining local knowledge and community views	Defined set of workshops with a river basin as a focus, working through the RSAT topics and analytical workshop approaches, emphasis on capacity-building	One or several workshops structured dialogue about information brought forward through Protocol assessments, emphasis on interlinked and cumulative issues	Ongoing series of workshops reviewing and discussing available information and information gaps around areas of water resource related risk and vulnerabilities.
Potential Sponsors	MRC, NARBO, ADB, IFC	MRC, Member countries	AOB, IFC	MRC, Member Countries, Oxfam, WWF	Protocol Governance Committee members	WWF
Reports	Mapped information An Action Plan supporting a River Basin Management Plan Status reports and updates	Mapped information An Action Plan supporting a River Basin Management Plan Status reports and updates	CIA or SEA chapters and appendices	Workshop reports as needed for workshop participants and funding organisations	Meeting reports, which may include agreed actions	Meeting reports, with emphasis on action identification and allocation amongst industry participants.
Report author	RBO or designated lead organisation (can rotate)	RSAT facilitator for MRC, Member countries	CIA or SEA consultants	Workshop facilitators	Workshop facilitators	Workshop facilitators
Target Participants	Within basin stakeholders, invited external agencies	Related Government agencies from both countries	Diverse representation of key stakeholder groups	Targeted sector representatives for capacity-building	Key stakeholders for Protocol assessments, plus invited key basin stakeholders	Representatives from hydropower and other water-reliant industries in basin



RSAT for River Basin Organisations

Rationale

The RSAT is a river basin tool. A number of LMB countries have legislation that enables the establishment of RBOs. RBOs are still in their infancy in the region. The RSAT has considerable potential to be a good support tool for RBOs in current and future hydro power-intensive river basins as they develop, and for hydropower-intensive river basins in the future.

Purpose

To provide a structured guide to identify and address key sustainability issues in a hydropower-intensive river basin over time.

Method of Application

RSAT application would guide an ongoing series of workshops over many years. Workshops could be scheduled over time to provide a mix of whole-of-RSAT evaluations and topic-specific evaluations.

The focus of attention would be internal to the basin. Discussion of issues should be directed to where in the basin these issues are evident or could potentially to emerge, and what the potential implications for other areas in the basin could be. Use of maps and understanding of hydrology as the agent creating the linkages in water-based issues is critical for these workshops.

Actions are an important outcome and time should be prioritised to develop these. Actions should not be directed to those outside of the room, but should be committed to by workshop participants. Actions should be small and

realistic and designed to be achieved. Small steps are fine and encouraged. An action to develop a basin-wide fisheries monitoring program is not ideal. An action for someone in the room to speak with an organisation that has expertise in fisheries monitoring to see if they could come to the next meeting to talk about approaches and options would be more achievable.

Follow-up and continuity are critical.

Potential lead agencies

MRC, NARBO, ADB, IFC

- The MRC's mandate to support transboundary water governance makes the RSAT a good institutional fit
- NARBO is dedicated to support Asian river basins
- ADB is one of the originating RSAT partners, and one of the main supporters of NARBO
- IFC is supporting good water governance, and development of river basin profiles, which would be a key support area for RBOs and an excellent information input to complement RSAT.

Reports

Reports would include mapped information about the basin, both from the information brought in during the preparation stage and from the inputs from workshop participants. Map development and refinement can be demonstrated over time.

An Action Plan supporting a River Basin Management Plan (RBMP) would be an important part of a report. Actions should fit the RBMP objectives and issues. Status reports and updates on the Action Plan supporting the RBMP would be part of the report.

Report author

The RBO or a designated lead organisation amongst the basin stakeholders could be responsible to produce the report. The lead organisation could potentially rotate.

Target Participants

Within basin stakeholders, invited external agencies.

Discussion

Many RSAT assessments highlight information gaps in a river basin. These then are prioritized and converted into actions, many to undertake studies or monitoring. The wording of the RSAT criteria makes the focus always at the basin scale, meaning the scale of requirement of even a single recommendation (which may be amongst 50 recommendations) can be a huge undertaking in terms of resources and organizational requirements. Chances of implementation are low in the timeframe needed to create a sense of momentum and action generated by the RSAT process.

There may be some necessary evolution over time. A basin's mature and, information is better collected, there will be some shift in attention from information needs to actions that act on that information. This may take decades. In the meantime, any organization receiving these recommendations for action may not receive them with enthusiasm, as most government agencies (even in developed countries) struggle to meet their core responsibilities under usually constrained resources. These recommendations may help build a case for funding in these areas, but because the reports are not published they are not accessible.

RSAT criteria present an idealized list and it is interesting to speculate how many would be met in river basins in developed countries with

intensive hydropower.

A shift in RSAT's focus from whole-of-basin attention to within-basin attention could be a game-changer. An RSAT assessment brings basin stakeholders into the room together who may not otherwise have the opportunity to exchange knowledge, insights, capabilities and aspirations. Based on RSAT applications to date, this group calls for actions by those not in the room to do things for the basin. The intent of an RSAT assessment could be to empower basin stakeholders to influence their own basin future. To do this would require an orientation towards collecting and building on the knowledge and capacities in the room, and creating responsibility and alignment in actions arising from the meetings.

Approaches that would support the above concept include:

- Design RSAT workshops much more strongly around basin map views. There may be some very clever GIS tools that could assist this. Map-based knowledge from the information collected during the preparation stage would provide what is known to the workshop participants. Laminated print-outs of basin hydrology and the simplest mapping of features, onto which people could put post-its with different types of information would be instrumental. A map view could be developed in the workshop to show where the individuals in the room provide knowledge and influence, and where there are critical gaps. An important message is that collectively a lot more is known and can be worked with than individually. For the issues discussed, hot spots and focal areas could be mapped, even if based on little information but just concerns (e.g. rumour of a cement factory being built adjacent to the river in an approximate area). The discussion then could be how these areas of concern are interlinked (e.g. implications of the different hot spot areas for institutional responsibilities, river flows, water abstraction, water discharge and water quality issues, community uses and needs...).



- Design RSAT actions much more strongly around what those in the room can do. The emphasis would be on creating continuity over time through small steps and bridging interlinked areas. Example actions could be: offering to host the next RSAT workshop; inviting a key participant gap to come to the next meeting; asking to visit an area of concern as part of the next meeting and for the responsible party to explain what is being done to address it; initiating some local monitoring (observations of water level, fish catch, water colour, turbidity) which could potentially be done by schools; asking a donor to fund a particular activity; and/or having a more specific follow-up discussion meeting with relevant parties on a particular issue.

- The creation of RSAT criteria for River Basin Residents would help draw attention to what those in the room could be doing locally, with alignment to the bigger basin picture and to match efforts of those in other parts of the basin.

Box 1 (over two pages) provides an outline of a generic River Basin Management Plan. Training for RSAT facilitators could include an understanding of RBMPs and how RSAT workshops can support developing, implementing and following up on the action plan.

BOX 1

An Example River Basin Management Plan

Executive Summary

- 1 Introduction**
- 2 Principles and objectives for [Name] river basin management**
 - 2.1 Underlying principles, legal and policy basis for IWRM and sustainable hydropower development
 - 2.2 Objectives for the [Name] River Basin Management Plan
 - 2.3 Operational Principles for the [Name] River Basin Management Plan
- 3 Maintaining the water resources of the [Name] River Basin**
 - 3.1 Strategic importance
 - 3.2 Risks associated with hydropower development
 - 3.3 Management strategies
 - 3.3.1 Water resource management
 - 3.3.2 Water quality management
 - 3.3.3 Environmental flows
 - 3.4 Action plan for quantity and quality of water resources
- 4 Maintaining the diversity and productivity of aquatic ecosystem resources of the [Name] River Basin**
 - 4.1 Strategic importance
 - 4.2 Risks associated with hydropower development
 - 4.3 Management strategies
 - 4.3.1 Dam design considerations for aquatic ecosystems
 - 4.3.2 Managing aquatic ecosystems
 - 4.3.3 Managing fishery resources
 - 4.4 Action plan for aquatic ecosystem resources



- 5 Maintaining vegetation cover and soils in the [Name] River Basin**
 - 5.1 Strategic Importance
 - 5.2 Risks associated with hydropower development
 - 5.3 Management strategies
 - 5.3.1 Managing soil erosion and sediments from the hydropower projects
 - 5.3.2 Managing soil erosion in the catchment
 - 5.4 Action plan for vegetation cover and soils
- 6 Maintaining the diversity and productivity of landscape and terrestrial ecosystems of the [Name] River Basin**
 - 6.1 Strategic importance
 - 6.2 Risks associated with hydropower development
 - 6.3 Management strategies
 - 6.3.1 Protected Areas
 - 6.3.2 Forest off-set programme
 - 6.3.3 NTFP collection and the wildlife trade
 - 6.4 Action plan for landscape and terrestrial ecosystems
- 7 Maintaining the equitable usage of water and natural resources in the [Name] River Basin**
 - 7.1 Strategic importance
 - 7.2 Risks associated with hydropower development
 - 7.3 Management strategies
 - 7.3.1 Multiple use of reservoirs
 - 7.3.2 River transport and navigation
 - 7.3.3 Compensation and sharing the benefits of hydropower
 - 7.4 Action plan for benefit sharing and equitable use
- 8 Reducing the risks and impacts of water related disasters**
 - 8.1 Strategic importance
 - 8.2 Risks associated with hydropower development
 - 8.3 Management strategies
 - 8.3.1 Flood management
 - 8.3.2 Dam safety
 - 8.3.3 Considering climate change
 - 8.4 Action plan for water related disasters
- 9 Institutional Framework**
 - 9.1 Key Stakeholders
 - 9.2 River Basin Committee
 - 9.2.1 [Name] RBC Structure
 - 9.2.2 [Name] RBC Membership
 - 9.2.3 [Name] RBC Mandate
 - 9.2.4 Reporting Line and Legal Basis
 - 9.2.5 Sub-Basin Committees
 - 9.2.6 [Name] RBC Secretariat
 - 9.3 Participatory Framework
 - 9.4 Communications and Consultation processes
 - 9.5 Capacity Building action plan
- 10 Implementation Plan**
 - 10.1 Budget
 - 10.2 Responsibilities
 - 10.3 Timing



RSAT for Transboundary Rivers

Rationale

International disputes over water are often very difficult to resolve, and in some situations that have involved hydropower development on a shared river, disputes have been taken to the International Court of Justice. Hydro diplomacy is a negotiation among riparian countries to achieve shared benefits. The dialogue needs to be inclusive, embracing all concerned stakeholders and all sectors to achieve a sustainable goal. In hydro diplomacy, a negotiation platform, generally a river basin organisation, has a crucial role in bringing about a consensus among the stakeholders.

To ensure regional sustainability and security, it is necessary to strengthen cooperation on water resources management between riparian states. Often, rules, regulations and standards covering hydropower and other water-use are different between the two countries, making it difficult to find common ground. International water law can support this process by setting rules and standards to strengthen water governance, enforce principles, and facilitate relationships between different parties. The RSAT is seen as an important tool to facilitate transboundary dialogue between two countries sharing a river basin, and to pre-empt potential escalation.

Purpose

The purpose of a transboundary RSAT dialogue would be to improve the sustainability of hydropower development and operation in a shared river basin. Through dialogue, the concerns of each country can be considered to develop mutually agreed actions.

Method of Application

The RSAT transboundary dialogue would involve several meetings of a relatively small group of representatives from concerned government agencies from each country. Initial meetings would establish the aims and objectives of the transboundary dialogue and its scope; i.e. which of the RSAT topics to be discussed. Some of the topics have explicit transboundary sub-topics, and most of the other topics have transboundary implications. This initial meeting would then be followed by internal meetings and consultations to collect the data or evidence base in each country.

The main dialogue meeting or series of meetings would then consist of a presentation of the evidence on the topic from both countries, followed by discussions focused on the issues around that topic. The series of actions to be taken by both countries would lead to potential solutions or recommendations on these issues.

The process would require facilitation by a trained RSAT facilitator, who would work with both country teams to ensure that the focus on the topics and evidence collected is relevant

Potential lead agency

The MRC has a particular interest in encouraging transboundary RSAT dialogue between member countries sharing a tributary of the Mekong. The lead agencies in each country could be the Ministries responsible for Environment, or for Water Resources, or a river basin organisation in one or other of the countries.

Reports

A report would be prepared after each meeting with recommendations for follow-up actions, including future RSAT dialogue meetings. The recommendations for actions by each country would have to be considered and endorsed by their respective agencies.

Report author

The report author would be the facilitator, assisted by one member of the RSAT team from each country.

Target Participants

In this modality of transboundary dialogue, all the participants would be from government agencies, relevant to environment and water resources management and power sector planning and regulation. Participants should also include representation from government agencies in the border provinces in each country. Representatives from Foreign Ministries should also be involved.

Participants would be middle ranking technical officers bringing with them their own specific expertise and experience relevant to the topics being discussed.

Duration

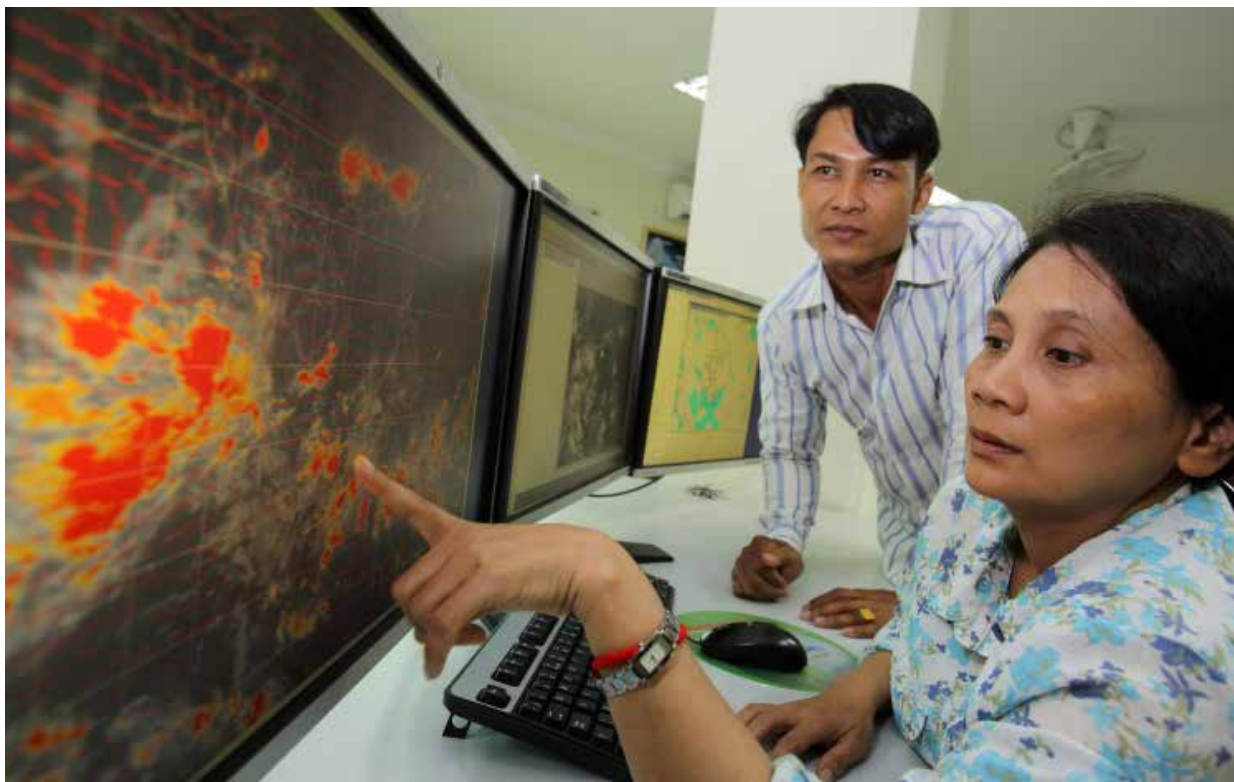
The transboundary RSAT process would probably take about 6 months from the initial meeting, through the collection of data to

the first dialogue meeting, which might last for about three days. Subsequent dialogue meetings could be arranged to consider further topics or to follow-up recommended actions.

Discussion

A transboundary RSAT dialogue should contribute to diplomatic relations between the two countries. It should be viewed as a means to address mutual concerns about the sustainability of hydropower in a shared basin. This means that the process is less one of negotiation in which each side knows what it wants from the beginning, and more one of exploring the issues, listening to the concerns expressed by either side and developing joint solutions.

Because such a dialogue would not be undertaken by senior decision makers, the recommendations would have to be presented to respective ministries for endorsement. If necessary, a higher-level meeting may need to be arranged to reach a more formal agreement.





RSAT for Cumulative Impact Assessment and Strategic Environmental Assessments (CIAs and SEAs)

Rationale

Cumulative Impact Assessments (CIAs) and Strategic Environmental Assessments (SEAs) are well understood in the LMB and in other parts of the world. They are key tools to identify, analyse and underpin planning for river basin scale issues relating to development. CIAs and SEAs have been undertaken in a number of river basins in the LMB. Increasingly, the issues arising from hydropower development are of a cumulative nature. RSAT can provide a good complement to CIA and SEA approaches with its hydropower-specific identification of issues and the participatory approach to tap into local knowledge and obtain stakeholder views, including those from the community.

Purpose

To demonstrate a participatory and multi-stakeholder process of consideration of key cumulative and strategic issues in a hydropower-intensive river basin.

Method of Application

RSAT would be applied during one or several workshops run by independent consultants, to add value to CIA or SEA assessments by

obtaining local knowledge and community views.

If used for several applications, the initial workshop could be to help scope the CIA or SEA, understand key issues to investigate, and start to identify and connect with key stakeholders. This workshop would run through all RSAT topics and flag the status of development in the basin and where the issues and areas of concern are.

A Follow-up workshop, and the workshop to be conducted if there is only one, would be based on the information collected during the CIA and SEA. It would present this information in a structured process aligned with RSAT topics, and aim to test and refine findings and build practical and meaningful recommendations.

Potential lead agency

ADB and IFC have supported CIA and SEA processes in the LMB in particular river basins.

Reports

The RSAT workshop(s) and outcomes would be embedded within the CIA or SEA reports as chapters and appendices.

Report author

CIA or SEA consultants

Target Participants

Diverse representation of key stakeholder groups. Participants would be middle ranking technical officers bringing with them their own specific expertise and experience relevant to the topics being discussed.

Discussion

Attachment 3 shows the distinction of RSAT to SEAs. From a market development perspective, clarifying the complementarity of RSAT to other

processes rather than the distinction could be strategic, to endeavour to get users of the other approaches to consider supplementing these approaches with an RSAT assessment. The RSAT in the case of CIAs and SEAs would be applied as a value-added approach.

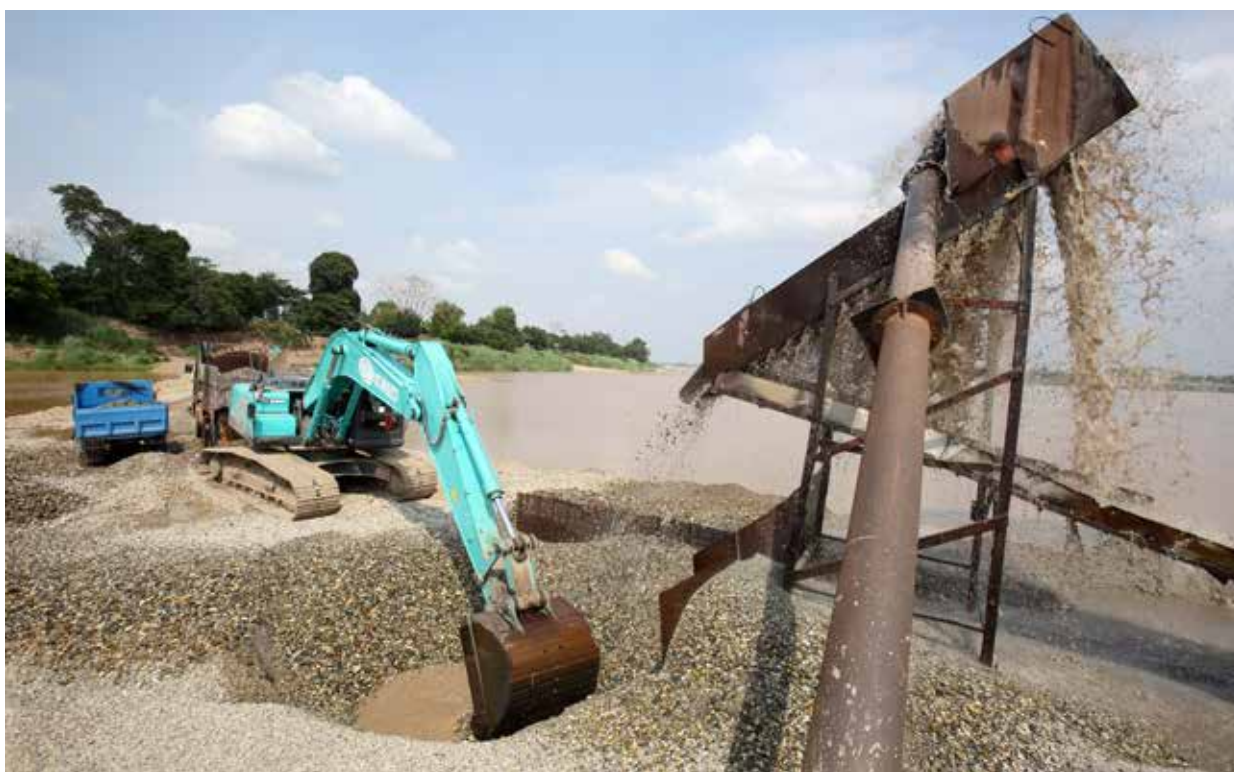
The How To Guide for RSAT for CIAs and SEAs could be informed by the experience of applying the RSAT for the Nam Ou CIA. As part of the methodology for the CIA and the Watershed Management Strategy, a rapid assessment of the sustainability of hydropower development in the Nam Ou river basin was carried out using the RSAT. The RSAT was applied to assess the readiness of the Nam Ou basin and the proposals for the cascade of seven dams by the developer for sustainable hydropower development. The RSAT was used as a 'big picture' tool, which looked not only at the proposal of the Project proponent, but also at the availability and capacity of Government, institutional structures and policies.

A systematic process was used to apply this tool by the CIA specialist in consultation with the environmental and social specialists of the consulting team and other informants from Government agencies. It was used to confirm

and identify issues that need to be addressed in the CIA, as well as aspects of sustainable hydropower that need to be further developed by both the developer and the Government of Lao PDR. It drew upon the expert knowledge of the consulting team of specialists working on the Nam Ou studies, and other information discussed with Government officials and advisers in river basin management and hydropower development. In an ideal CIA support process for the RSAT, interviews with the developer's staff involved with the river basin cascade would be undertaken, to get more specific information on how the company is addressing some of the issues raised.

Box 2 (over two pages) is an example of a topic summary from the Nam Ou CIA. In this case, an earlier RSAT version was used that included scoring. It should be discussed whether scoring added any value in this application, and whether the How To Guide should include this.

RSAT facilitators would need to be trained in CIA and SEA processes and how RSAT workshops can support these. Reporting templates would ideally be designed and their use demonstrated to the facilitators.





BOX2: AN EXAMPLE REPORTING TEMPLATE FROM THE NAM OU CIA BASED ON RSAT

Topic 7: Fish passage and fisheries management		
Strengths <ul style="list-style-type: none"> Fish resources very abundant, esp. in Upper and middle reaches In theory, DAFOs and PAFOs empowered to control and report on illegal fishing Fisheries Act and policies in place Almost every village of 18 village surveyed have at least one Fish Conservation Zone, supported strongly by communities (documented) MRC Preliminary Technical Guidance on mainstream Mekong dams specifies fish passage requirements, accepted by Lao government, but not applied in tributaries 		Weaknesses <ul style="list-style-type: none"> Very little prior knowledge of fish resources No monitoring being carried out ESIA study is focused on impacts assessment, not on monitoring DAFOs and PAFOs not able to enforce Hydropower fisheries management practices not yet defined in basin would have to be specified in EMP No requirement for hydropower to include fish passage facilities No real understanding of the contribution of the Nam Ou tributaries to fisheries
Opportunities <ul style="list-style-type: none"> Development of reservoir fisheries, but need to ensure access for fish to tributaries and spawning grounds for best productivity and diversity Development of aquaculture but note issues of access to water, land, financial resources and management skills Consideration of fish friendly turbines and explicit assessment of impacts on fisheries and power production 		Risks <ul style="list-style-type: none"> Man-made disturbances, especially gold mining, putting pressure on fisheries Two significant illegal fishing methods are poison and explosives Lowest dams in cascade are over 40 m high, which is too high for realistic fish passage Tributary migrations not really significant, except in lower or middle reaches. Mainstream channel is most important route for fish migration (upstream and downstream).
Recommended actions		Responsibility
1. Start immediate monitoring of fish and fish catches, to establish baseline		Company with Dept of Fisheries
2. EMP to include specific fisheries management recommendations		ESL
3. Surveys of tributaries to assess role in proposed reservoir fisheries, e.g. spawning		Company + consultants
4. Comprehensive reservoir fishery management plans to be developed, funded and implemented, including establishing critical habitats and fish conservation zones.		Company + consultants
Scoring justification: For each criterion provide a brief statement to justify the score allocated that refers to scoring statements and evidence supporting the score.³		
Criteria	Score	Justification
7.1	2	Minor gaps in understanding of fish resources. No current regulatory framework in managing fisheries in the basin. No hydropower regulations on fisheries defined
7.2	2	Fisheries assessments being carried out, but no hydropower requirements in place in the basin
7.3	3	Fish migration requirements assessed in both individual dams and cumulative cascade. None of these dams amenable to fish passage. Effective migration between Mekong and upper reaches of Nam Ou will cease. Emphasis would be on self-stabilising fish populations in the reservoir, with limited migrations up tributaries
7.4	2	Basin-wide assessments in place, migration patterns, and inform the EMP. ESIA and CIA will address the upstream and downstream requirements, and development of reservoir fisheries. No comprehensive plan for reservoir fishery development

³ Note that this assessment was done using RSAT version 3, which used scoring. During other trials scoring was found to be difficult to apply consistently and was therefore dropped in subsequent versions.

BOX2: AN EXAMPLE REPORTING TEMPLATE FROM THE NAM OU CIA BASED ON RSAT (CONTINUE)

Topic summary section for Assessment Summary Report						
Status (summary of key strengths & weaknesses)	<p>The Nam Ou river is a significant tributary of the Mekong from both fish production and biodiversity perspectives. Fish are very abundant and fishing is an important economic activity for riparian communities. Fish migration is an important feature. Most communities along the river have established Fish Conservation Zones. However, knowledge about the fish and fisheries is limited, especially the contribution made by the tributaries of the Nam Ou to overall production. Whilst fisheries regulations are in place, the provincial and district fisheries offices are unable to enforce these effectively. The designs of the cascades do not include any fish passage, and because of their height (more than 40m) it is unlikely that existing fish passage methods will be effective. Fisheries management practices for the reservoirs have yet to be defined.</p>					
Priority risks and opportunities	<p>Fisheries are under threat from a variety of sources, loss of habitat, illegal fishing, man-made disturbance, e.g. gold mining. The construction of the cascade will completely stop fish migrations up the Nam Ou from the Mekong. Some migrations may occur from the reservoirs into the tributaries, but this is not clear yet. There are opportunities for development of reservoir fisheries and aquaculture, but these have not yet been specified, and consideration should be given to fish friendly turbines that cause lower mortality.</p>					
Priority actions	<ol style="list-style-type: none"> 1. Start immediate monitoring of fish and fish catches, to establish baseline 2. EMP to include specific fisheries management recommendations 3. Surveys of tributaries to assess role in proposed reservoir fisheries, e.g. spawning 4. Comprehensive reservoir fishery management plans to be developed, funded and implemented, including establishing critical habitats and fish conservation zones 					
Comments:						
Linkages to other initiatives / projects / tools in the basin:						
Scoring results:						
Criteria:	7.1	7.2	7.3	7.4		
Score:	2	2	3	2		
<p>Was score independently verified? NO</p> <p>If yes, provide details of verification:</p>						



RSAT for Capacity-Building

Rationale

RSAT has clearly demonstrated its value as a capacity-building tool for sustainable hydropower and for IWRM principles applied to hydropower-intensive river basins.

Purpose

To support structured capacity-building on the key sustainability topics requiring attention in hydropower-intensive river basins.

Method of Application

RSAT would be applied through a defined set of workshops with a river basin as a focus, and with a defined group of workshop participants who may have a geographic area in common or a sectoral affiliation in common.

Workshops would work through the RSAT topics and analytical workshop approaches, with an emphasis on capacity-building.

Discussion and actions identified would be oriented towards the interests of the sponsor and the workshop participants.

Potential lead agency

MRC, Member Countries, Oxfam, WWF based on their support to date for this purpose of RSAT application.

Reports

Workshop reports would be developed as needed for workshop participants and funding organisations, to suit their objectives in supporting the RSAT application. A standard RSAT report as per the present template may be much more than is needed for this type of use.

Report author

Workshop facilitators.

Target Participants

Targeted sector representatives for capacity-building, or representatives from a particular geographic area, or representatives with a common interest in a method of application.

Discussion

RSAT has been applied in many ways to support capacity-building. The MRC applications have most primarily targeted line agencies. More recent applications funded by Oxfam and WWF have been focussed on training civil society organisations to support capacity-building and advocacy strategies.

RSAT focussed on particular stakeholder group capacity-building could be an important part of an overall strategy for improving river basin sustainability in hydropower-intensive basins. Some thought should be given to running workshops with specific hydropower companies so they can understand what it is that they are being invited to participate in and for what reasons. A yet to be explored outreach avenue would be trying to run RSAT workshops for capacity-building purposes directly with the energy planners and the environmental line agencies responsible for conservation plans and environmental management in a river basin, in order to see what might be possible in line with the original objectives of the ECSDH in developing RSAT.

Before going further with RSAT trainings for NGOs in Cambodia, the trainers felt that it would be better to develop the RSAT in simpler and more focused terms, so that the materials can then be used by the NGOs in their work with communities. In particular, the trainers felt that some thought should be given on how to present the content of the RSAT in a way that

is innovative, relevant and accessible at local levels. The use of visual aids was recommended by the participants to assist the communication of key concepts to their local level stakeholders. A simplified RSAT communication package for local levels should include an overview on the hydropower project cycle, key decision points and the most important planning and decision-making processes in the Mekong region.

In developing the RSAT-based communication materials for sustainable hydropower for NGOs and local communities, the following steps were proposed:

- Develop an introduction for the package, with the purpose and information about the project cycle, when and what to be advocating, and how to use the materials together with a trial set of materials for two topics, e.g. fisheries and benefit sharing, based upon the structure outlined below:
 - What are the issues?
 - What can be done about them in a sustainable hydropower project?
 - What should NGOs and communities expect to see at different stages of a more sustainable hydropower project?
 - What can NGOs and communities do to make a hydropower project more sustainable?
- Keep the materials quite short (4 – 5 pages per topic) and use visual aids as much as possible.





RSAT for NGO Hydropower Strategy development

Rationale

NGOs can have a critical position on the development of hydropower in a country, and sometimes with a focus on a particular hydropower project. They may be advocating against such a project, or they may be trying to ensure that their environmental or social concerns are addressed satisfactorily. Sometimes their advocacy stems from the fact that communities with which they have been working are likely to be impacted by the development of hydropower. RSAT can be used with single NGO, or with a group of NGOs to focus their strategies for advocacy for greater sustainability in hydropower development.

Purpose

This application of RSAT would aim to enable an NGO to develop its position and advocacy strategy for hydropower development in general or for a particular hydropower project. The staff of the NGO would be clear about the areas of focus for their advocacy work, or the actions that they will take with the potentially affected communities.

Method of Application

The RSAT would be used internally by the staff of the NGO to identify the strengths, weaknesses opportunities and threats of the hydropower development. The use of a stakeholder analysis will help them to identify which organisations they should be addressing their advocacy towards and on which topics. It

is important that the necessary evidence base for the topics is collected and used to inform the discussions, because otherwise the discussions tend to become driven by uninformed opinions. Using the RSAT framework of topics brings a focus to the discussions, and the topics may be chosen to reflect the particular interests of the NGO. An independent RSAT facilitator is useful in this process to keep the participants on topic and focused on developing the strategy.

Potential lead agency

The lead agency would be the NGO itself, or a group of like-minded NGOs. In the past, Oxfam provided funds for WWF training in advocacy development for NGOs in Cambodia.

Reports

The report of the discussions would be prepared, leading to a final advocacy strategy document.

Report author

The report of the discussions could be prepared by the facilitator, or a staff member of the NGO. The Strategy document would have to be prepared internally by the NGO.

Target Participants

Participants would be the senior staff of the NGO responsible for determining the direction and operating strategies of the organisation.

Duration

The duration of such an RSAT assessment would probably require about three days of internal meetings. Data collection to provide evidence would be needed before the meeting and this might take two to three weeks.

RSAT as a Protocol Supplement

Rationale

RSAT was inspired by and derived from the Hydropower Sustainability Assessment Protocol (the "Protocol"). The original vision for the RSAT was to be part of the Protocol suite of hydropower sustainability assessment tools. Many of the organisations who support governance and application of the Protocol adhere to the objectives of the RSAT to support sustainability in hydropower-intensive river basins. RSAT is a natural complement to the Protocol to widen out the scope of what the Protocol, aimed at the individual hydropower project, can achieve.

Purpose

To enable consideration of findings of Protocol assessments of hydropower schemes in a hydropower-intensive river basin and identify actions for Follow-up.

Method of Application

For the Protocol's Early Stage tool, RSAT workshops could be built into the process of information collection and analysis similar to that proposed for CIAs or SEAs.

For the Protocol's Preparation, Implementation and Operation tools, RSAT would be applied through one or several workshops to provide a structured dialogue about information brought forward through Protocol assessments.

The emphasis would be on interlinked and cumulative issues relating to the hydropower projects in the basin. Action identification and follow-up allocation may or may not be an

important aspect of the application, depending on the sponsor's interests.

Potential lead agency

Protocol Governance Committee member organisations, such as the World Bank, The Nature Conservancy (TNC), International Institute for Environment and Development (IIED), Inter-American Development Bank (IDB), Norad, SECO.

Reports

Meeting reports, which may include agreed actions.

Report author

Workshop facilitators.

Target Participants

Key stakeholders for Protocol assessments, plus invited key basin stakeholders.

Discussion

The Protocol's Early Stage tool is designed to support the same objectives that the RSAT was designed to support. The Protocol Early Stage tool has been applied at a single project scale, at a group of projects, and at a national energy planning scale. The method of application of the Early Stage tool is with independent Protocol Accredited Assessors conducting interviews, reviewing documents, and visiting sites to form an evidence base for making determinations on performance against the Protocol performance criteria. There is not a participatory dialogue component to this approach. Norad and SECO are funding applications of the Protocol Early Stage tool and there may be interest to explore merged approaches. The World Bank is also funding Protocol-guided institutional capacity-building in four countries on the Zambezi River, and there may be interest in exploring using the RSAT to build on what the Protocol can offer.



For specific hydropower projects assessed with one of the Protocol's scoring tools (Preparation, Implementation, Operation), the RSAT can complement application of the Protocol by considering findings in a basin-scale context where companies are willing to make the report publicly available. The method of application for RSAT would be drawing on the information collected in a Protocol assessment and using it to inform an RSAT workshop. There is the potential for the workshop to be used for identification of opportunities for agreed and even shared actions for basin-

scale management objectives. Ideally the hydropower projects in a basin would all have undertaken Protocol assessments.

If only one Protocol assessment has been undertaken in a river basin with more planned or existing hydropower projects, and the developer was willing to make the report public, the RSAT application could be oriented towards considering findings for a single project in light of the basin-wide implications and the interlinking areas with the other hydropower projects.



RSAT for Water Stewardship

Rationale

WWF has been working on water stewardship for many years. Being able to demonstrate how RSAT can support water stewardship would not only enable WWF Mekong to clearly tie its promotion and support for RSAT to its water stewardship programme, but may demonstrate to WWF International that RSAT can play a role in other parts of the world. Water stewardship is about building the understanding of water-reliant and water-impacting businesses that they share many water-related risks, and that collaborative approaches to improving water governance in a basin is in their interests.

Purpose

To identify and evaluate areas of shared risk for water-reliant and water-impacting industries in a hydropower-intensive river basin.

Method of Application

RSAT would be applied through an ongoing series of workshops in hydropower-intensive river basins. These workshops would review and discuss available information and information gaps around areas of water resource related risk and vulnerabilities. The workshop would aim to establish where the basin sits on the steps towards water stewardship (Figure 7 below), and how to move to the next step. Important to this purpose is to spend time in the workshop discussing hydropower life cycle stages and the changing nature of issues for hydropower developers and operators as river basins mature.

Potential lead agency

WWF

Reports

Meeting reports, with emphasis on action identification and allocation amongst industry participants.

Report author

Workshop facilitators.

Target Participants

Key stakeholders for Protocol assessments, plus invited key basin stakeholders.

Discussion

The following text on WWF's water stewardship programme is taken from <http://www.allianceforwaterstewardship.org/about-aws.html#what-is-water-stewardship> and http://wwf.panda.org/what_we_do/how_we_work/conservation/freshwater/water_management/

Stewardship is about taking care of something that we do not own. Stewardship approaches that focus on the management of public goods like forests, fisheries or, in our case, freshwater resources, are based on the premise that we are all accountable for the sustainable management of those resources and are, therefore, based on collective responses. We define water stewardship as:

"The use of water that is socially equitable, environmentally sustainable and economically beneficial, achieved through a stakeholder-inclusive process that involves site and catchment-based actions. Good water stewards understand their own water-use, catchment context and shared risk in terms of water governance, water balance, water quality and important water-related areas; and then engage in meaningful individual and collective actions that benefit people and nature."



Notes:

- Socially equitable water-use recognizes and implements the human right to water and sanitation and helps to ensure human wellbeing and equity.
- Environmentally sustainable water-use maintains or improves biodiversity, ecological and hydrological processes at the catchment level.
- Economically beneficial water-use contributes to long-term sustainable economic growth and development and poverty alleviation for water-users, local communities and society at large.
- Internal actions: within the site and under the responsibility of the site management.
- External: actions in collaboration with others in the catchment, and including actions in the supply chain and the catchment as a whole.
- Water stewardship is intended to support and contribute to Integrated Water Resource Management by all actors.

People, wildlife and businesses all rely on freshwater to survive and thrive.

Yet our freshwater ecosystems are under increasing pressure. There is less to go around than ever before, and what's left is getting dirtier as we fail to protect our rivers, lakes and streams. Given we all depend on freshwater,

the global water crisis is important to all of us, including the private sector.

Water stewardship is about business understanding the risks they face from water scarcity and pollution, and taking action to help ensure water is managed sustainably as a shared, public resource.

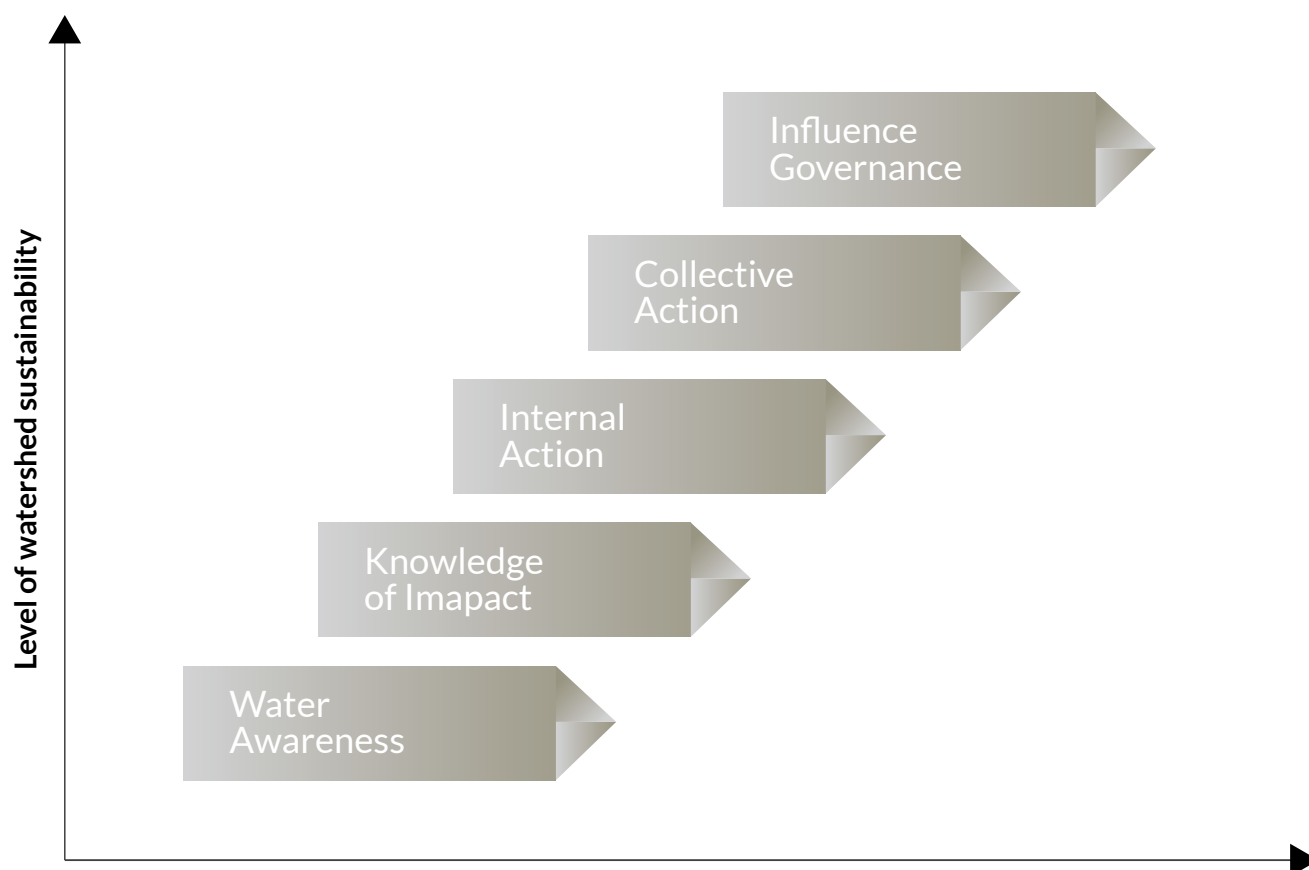
Stewardship goes beyond being an efficient water-user. It is about the private sector collaborating with governments, other businesses, NGOs, communities, and others to protect shared freshwater resources. WWF is helping redefine the role of the private sector in advocating, supporting and promoting better basin governance for the benefit of people and nature.

WWF is focusing our water stewardship work on 15 priority river basins across the globe (Figure 8) – all exceptional ecosystems, rich in biodiversity, yet all under pressure. From the Amazon to the Zambezi, we have leveraged our extensive local networks as well as our global expertise to develop strategies that engage businesses, communities and government to improve water management. We will raise awareness of water risks and facilitate collective action in these river basins; an essential step to reducing risk.

FIGURE 8: WWF PRIORITY RIVERS FOR WATER STEWARDSHIP WORK



FIGURE 9: STEWARDSHIPS STEPS APPROACH.



The water stewardships steps approach (Figure 9) is designed by WWF to help situate and better understand the differing activities of companies and to show where different companies were acting on water issues. The steps do not represent a wholesale description of action for every company, especially considering that the local nature of water will dictate where some companies engage. They also do not distinguish sectoral and geographic differences, associated risk exposure, and the scale at which a company wants to (or has to) act.

These steps help guide any Water Stewardship strategy. While they are basic in definition there is a lot of depth and detail to each step. There is clearly an overlap between steps, meaning that they should not be seen as prescriptive and contained, but rather fluid and inter-connected.

The steps are also not meant to be linear in the sense that companies make a graduation between the steps as they evolve in their thinking and experience. Instead, they are an iterative process of learning, acting, doing and improving. Lastly, not all companies will



take this journey. Depending upon the sector, their risk, their ambition, etc, they may work at certain parts of these steps.

1. Water Awareness – Gaining an awareness of water issues – in terms of how water impacts business and how business impacts water – is an on-going and iterative step for all companies. A key facet of awareness is internal engagement. From the CEO level to plant managers and suppliers and employees, building awareness can help companies ‘sell’ the water story within to elicit action where it matters. Water awareness can also highlight how a company is perceived by others, including basin stakeholders, the press, and consumers, which in turn influences the degree of risk that a particular company faces. External debates and their sector-specific implications will inform a company’s understanding of water and its associated risks, and will influence strategy and interventions.

At its most basic, water awareness must include an (high level) understanding of the global water challenges, the dependence a company has on freshwater and their exposure to water-related risks.

2. Knowledge of Impact – Impact refers to the wider understanding of where a company’s ‘footprint’ is actually located in terms of direct (company operations) and indirect (supply chain) water dependencies. This generally includes measuring elements of water-use, as well as an estimation of ‘impact’ on water resources. In this step, many companies begin to look beyond the fence line of their operations to understand the wider context of their water-use, including global debates, peer examples, and relevant watershed issues.

Hot-spot and risk analysis can help drive understanding of these impacts. These assessments should include the ‘context’ of the basin, as well as the identification of high risk ‘hot-spots’ caused by water quantity and/or quality issues.

3. Internal Action – Internal action implies that some element of learning and prioritisation has occurred and a strategy (of some sort) is in place. For most companies, this is the more comfortable first step of getting one’s own house in order by outlining goals, targets, actions, and plans that will help tackle the more immediate solutions to the problem - the low-hanging fruit. Internal action tends to incorporate the following crucial activities: company targets to reduce baseline water-use; launch of water efficiency pilot projects; engagement with employees, consumers and marketing to address opportunities and risks; improvement of water quantity and quality reporting; and pollution prevention.

This is also the step where companies begin engaging their suppliers, and assess how to take action to realize supply chain improvements through alternative sourcing, product innovation, or improved management of water in the production of raw materials.

4. Stakeholder engagement – In this step, a recognition that working with others and at various scales (global fora to local water groups) is a necessary part of a robust water stewardship strategy. Engagement with stakeholders where company water-use and associated risk is high can help mitigate basin-related risks, boost reputation on water issues, and build brand trust and loyalty. Stakeholders can be anyone from other users in a particular watershed, to other companies, NGOs, sector initiatives, public agencies, and standard-setting bodies.



Stakeholder engagement can take the form of participation in public fora to address water management issues, support for freshwater conservation projects in watersheds of importance to company operations, partnerships with watershed groups, NGOs or other companies that pool technical, human, and financial resources to conserve and improve freshwater resources, and participation in collective actions to improve water management, such as the effort currently under way to develop and promote a global standard for water stewardship.

5. Influence governance – Depending on the sector and their exposure to risk, this step can be one of the trickiest for companies. It is also where engagement can bring about higher risk (perhaps for shorter periods) but is nonetheless a course of action which requires careful planning and thought.

The motivation for engagement is usually due to circumstances of direct impact to a

company, and depending will consist of actions ranging from advocacy, influencing or lobbying, partnership, financial support, facilitation, institutional strengthening etc. This will also reflect the scale at which intervention takes place, either local, watershed or at a National/ state level.

In some places, companies may choose to use this strategy if risk is high or the imperative for better management from public authorities is seen as a future risk. Most engagement activity will depend on the sector and their ability to influence, whether or not they are a strategic partner of government (energy, water provision) or if they are a manufacturer of goods. The opportunities through engagement can mean a significant loss of risk, including social and legal license to operate and clearer and consistent laws and regulations that govern company water-use.





PART 5: RSAT Toolbox



Tools for data collection

Institutional mapping in the preparation stage

The table below can be used to conduct a basic institutional analysis to map regulatory and governance institution's roles and

responsibilities for hydropower sustainability in the basin at different levels. Table 7 should be completed to list the institutions at different levels with responsibility for different aspects, using the RSAT topics, criteria and performance statements as a guide to identifying institutional responsibilities. A similar table can be constructed to map the relevant legislation, regulations and policies for each of the topics.

TABLE 7: INSTITUTIONAL MAPPING FOR RSAT ASSESSMENT

Key institutions and stakeholders with responsibilities		
Topic 1: Institutional capacity		
	Institutions	Roles and responsibilities
International		
National		
Provincial		
Local		
Other		
Topic 2: Options assessment, siting and design		
	Institutions	Roles and responsibilities
International		
National		
Provincial		
Local		
Other		



Topic 3: Economic contribution of hydropower		
	Institutions	Roles and responsibilities
International		
National		
Provincial		
Local		
Other		
Topic 4 Equitable sharing of hydropower costs and benefits		
	Institutions	Roles and responsibilities
International		
National		
Provincial		
Local		
Other		
Topic 5 Social issues and stakeholder consultation		
	Institutions	Roles and responsibilities
International		
National		
Provincial		
Local		
Other		
Topic 6 Environmental management and ecosystem integrity		
	Institutions	Roles and responsibilities
International		
National		
Provincial		
Local		
Other		

Topic 7 Flows and reservoir management		
	Institutions	Roles and responsibilities
International		
National		
Provincial		
Local		
Other		
Topic 8 Erosion, sediment transport and geomorphological impacts		
	Institutions	Roles and responsibilities
International		
National		
Provincial		
Local		
Other		
Topic 9 Management of fisheries resources		
	Institutions	Roles and responsibilities
International		
National		
Provincial		
Local		
Other		
Topic 10 Dam and community safety		
	Institutions	Roles and responsibilities
International		
National		
Provincial		
Local		
Other		



Categories and sources of data

Table 8 provides a list of the categories of data and information that will be used as evidence to conduct an assessment, and the potential sources of information.

TABLE 8: SOURCES OF EVIDENCE

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.

Interview schedule for assessment

One source of data is taken from interviews of selected experts with knowledge, experience and /or responsibility for activities in the basin. The assessment preparation team should identify suitable people for interview and develop an interview schedule. It is important for the assessment preparation team to understand the specific information that is required from interviewees. Topic Checklists and performance statements should be used for this purpose. The table below can be used as a record of who was interviewed for the assessment, and should be attached to the assessment report as an appendix.



TABLE 9: INTERVIEW SCHEDULE

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			



Checklists related to performance statements

Two different checklist approaches have been developed to assist in the collection of relevant data.

1. **RSAT data collection template.** This takes each topic and sub-topic in turn and poses two or three key questions for each criterion, with spaces for assessment methods and outcomes.
2. **RSAT Topic and performance statement checklists.** This set of checklists develops the performance statements for each topic/sub-topic and criteria into a series of questions that can be answered Yes/Present, No/Absent, and Partially. The partially column can be further subdivided into three sub-columns (Old or out of date, ineffective and inadequate)

TABLE 10: RSAT DATA COLLECTION TEMPLATE – EXAMPLE FROM VIET NAM

Topic 4 Equitable sharing of hydropower costs and benefits
<p>Key stakeholders:</p> <ul style="list-style-type: none"> • MOIT (e.g. ERAV and local Departments) • MARD (e.g. General Administration of Irrigation, General Administration of Fisheries, and local Departments) • MONRE (e.g. Administration of Water Resource Management and local Departments) • MOPT (e.g. Statistic Administration and POPTs) • Local committees, NGOs, Unions, and Hydropower companies <ul style="list-style-type: none"> • Economically, how are the sharing of hydropower costs and benefits conducted and delivered to different local levels and forms in Sre Pok? • Equally, how do they contribute a net benefit to the local people/river basin residents in Sre Pok? • Financially, who is responsibilities to deliver the benefits?
<p>Requirements for topic overview</p> <ul style="list-style-type: none"> • Describe all costs and benefits of the hydropower project over its lifetime • Describe a process of contribution or sharing of benefits to stakeholders • Describe which/stakeholders benefit
<p>Sources of data</p> <ul style="list-style-type: none"> • EIA reports • Trans-Government, institutional, unions, local citizens, university studies relating to sharing benefits of hydropower projects • Statistic yearbooks, independent surveys, and interviews

**TABLE 10: RSAT DATA COLLECTION TEMPLATE – EXAMPLE FROM VIET NAM (CONTINUE)**

4.1 Transboundary benefit sharing			
Issue	Questions	Assessment methods	Outcomes
River basin planning	<p>Does a transboundary basin development plan or strategy provide an agreed framework for riparian states to consult on cost and benefit sharing options?</p> <p>Does the plan include provisions for assessment (causes, effects (e.g. cumulative impacts), and benefits) of hydropower development on regional rivers or projects?</p>		
Energy/power sector planning and regulation	<p>Are options for regional grid interconnection and joint hydropower project ownership assessed and considered?</p> <p>Are transboundary benefit sharing arrangements in hydropower project level agreements between riparian states embedded in Sre Pok?</p>		
Hydropower projects	Is assessment of transboundary cost and benefit sharing options, and target beneficiaries conducted for projects within the regional and provincial regulatory framework?		
Regulatory and governance	Are regional obligations (e.g. risk assessment, benefit sharing, monitoring, and evaluation provisions) imbedded in Sre Pok mechanisms and procedures?		



4.2 National to local benefit sharing			
Issue	Questions	Assessment methods	Outcomes
River basin planning	<p>Does basin-wide planning in Sre Pok include provision for distribution of hydropower costs and benefits across sectors and communities?</p> <p>Do specific plans exist for women, ethnic, vulnerable, minority groups and others to access benefits?</p> <p>Is the development contribution of benefits monitored and is disaggregated data used and publicly disclosed at the local level?</p>		
Energy/power sector planning and regulation	<p>Are monetary and non-monetary benefits from hydropower distributed across sectors within a regional to local policy and budget allocation framework?</p> <p>Are communities in Sre Pok prioritised for rural and ethnic electrification?</p>		
Hydropower projects	<p>Are hydropower project benefits and forms of benefit sharing assessed and selected in consultation with beneficiaries?</p> <p>Are project level commitments for additional benefits and benefit sharing arrangements funded and implemented over agreed timeframes?</p> <p>Have hydropower projects maximised opportunities (e.g. training, employment and capacity building programs) to benefit communities in proximity?</p>		



Regulatory and governance	<p>Do project agreements and regulatory mechanisms secure revenues and provide for consistent distribution of socio-economic benefits in Sre Pok?</p> <p>Do policy and planning approaches include provision to maximise local level benefits in Sre Pok?</p> <p>Are institutions and committees established to ensure delivery of agreed benefit sharing measures such as reporting of expenditure and monitoring of performance?</p>		
4.3 Financing ecosystem protection and other measures			
Issue	Questions	Assessment methods	Outcomes
River basin planning	<p>Do hydropower revenue and other funding mechanisms (e.g. Payment for Ecological Services) contribute to ongoing funding of environmental protection, natural resource management, and social projects in Sre Pok?</p> <p>Are there adequate resources and human capacity for environmental protection and natural resource management measures in Sre Pok?</p>		
Energy/power sector planning and regulation	<p>Is assessment of opportunities for innovative financing, including carbon financing (within the international and national framework) conducted for hydropower development in Sre Pok?</p> <p>Does regional and provincial energy policy guide the allocation and expenditure of funds derived from carbon financing in Sre Pok?</p>		



Hydropower projects	Do hydropower ESIA studies, management plans, and financial studies assess financing options (including carbon finance) to address environmental mitigation measures and environmental off-set programs in Sre Pok?		
Regulatory and governance	<p>Does a regulatory framework exist to secure sustainable financing from hydropower for a range of environmental off-set and watershed protection measures?</p> <p>Are regulations and enforcement enforcement effective? Who is responsible to monitor enforcement?</p> <p>Do natural resource management and environment agencies have adequate financial and human capacity to deliver core functions?</p>		

How to present evidence for an RSAT assessment

Templates are available to assist the presentation of assessment data. A summary handout of data is prepared for the assessment participants and a summary PowerPoint presentation for each topic is prepared to present the evidence and the results of the preliminary gap analysis conducted during the data gathering stage for each topic.

The sources of evidence should be collated into a bibliography (to be included in the report) and the most relevant data made available to the participants where possible to review during the assessment.



TABLE 11: RSAT TOPIC AND PERFORMANCE STATEMENT CHECKLISTS

Criteria	Questions to ask and information to be collected for the assessment based on the basin context and stage of development	Yes/Present				Partially present	No/Absent	Source – where will you find this information	Results Use this column to record responses and information that you find during your data collection. You will then use this information for the gap analysis against criteria.	
										Old or out of date
1.1 Trans-boundary institutional capacity										
River basin planning	Does a transboundary RBO exist within an agreed framework for transboundary basin cooperation or information collection and storage?									
	Have procedures and mechanisms been agreed for countries to notify, and consult for hydropower projects within international river basins?									
	Do countries comply with their obligations under these agreements and consult in good faith?									



Energy/ power sector planning and regulation	Hydropower projects	Are national energy agencies and regulatory authorities represented in transboundary basin planning processes?	Planning studies relating to hydropower projects on international rivers are carried out within agreed frameworks for transboundary cooperation.	In the operations stage, transboundary communication and coordination between hydropower projects and RBOs is evident.	Are national laws and regulations compatible with international, regional, provincial agreements, plans, and policies for transboundary impact assessment?	Are regulations covering transboundary impact assessment for hydropower projects on international rivers enforced?
Regulatory and governance						



Dialogue Tools for assessment

Examples of assessment methods are listed below and are described in more detail in the Assessment Stage section of this Guide:

- Institutional mapping and gap analysis
- Multi-criteria gap analysis
- SWOT analysis
- Action planning

Institutional mapping and gap analysis during assessment

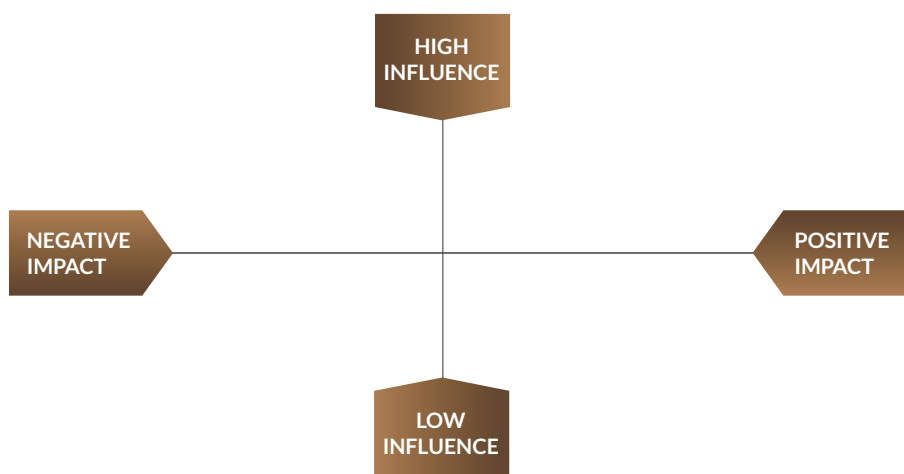
A description of the institutional mapping process is provided in the previous section and includes a basic template. This process can also be used as a group assessment method during the assessment workshop. The assessment preparation team will decide if there are advantages to conduct a group institutional mapping and gap analysis during the assessment. This will depend on the objectives of the assessment. For example, if the objective of the assessment is to clarify

roles and responsibilities, then a group method would be valuable. Completing an institutional mapping exercise in the preparation stage will assist the facilitator to gain an understanding of the institutional setting for the basin.

Another participatory stakeholder mapping tool is the Stakeholder Influence/Impact Matrix, shown below in Figure 10. This is useful for demonstrating which stakeholders have more or less influence upon decisions for hydropower development in a basin, and those which are more or less impacted by hydropower development (either benefiting or negatively impacted).

Participants are first asked to create their list of relevant stakeholders (for the topic under discussion, or for sustainable hydropower in the basin). They are then asked to place the names of these stakeholders (on stickers) in the appropriate quarter of the Stakeholder Influence/Impact Matrix. They then can discuss the implications of this matrix for encouraging more sustainable hydropower development in the basin. The stakeholders which have high influence in decision-making on hydropower and water resources may be the focus for the recommendations during the later topic discussions.

FIGURE 10: STAKEHOLDER INFLUENCE-IMPACT MATRIX





Multi-criteria gap analysis

Data is presented on each topic to provide the current status of the basin for that topic and to address the specific RSAT criteria and performance statement requirements in the Topic. The data gatherer or facilitator presents an analysis of where there are gaps against the performance statements and where there are areas of good performance. The assessment group then considers the evidence presented

and the basin status to identify which gaps are most significant for the basin and whether they represent priority issues for the basin. The evidence, significant gaps, strengths and priority issues for the topic are recorded. This analysis of evidence and status of the basin for the topic against performance statements provides the basis for the SWOT analysis. An example of a gap analysis for Topic 7, sub-topic 1, Multiple water-use optimisation and efficiency is shown in Figure 11.

FIGURE 11: EXAMPLE OF GAP ANALYSIS FROM RSAT ASSESSMENT AT UBOL RATTANA DAM IN THAILAND

Topic 7.1: Multiple water-use optimization and efficiency	
A. River basin planning: <ul style="list-style-type: none"> Baseline data exists on water availability, demand and consumptive and non-consumptive water-use, including navigation and fisheries. A hydrological model has been developed for the basin and addresses different water-use scenarios. The effect of climate change on future water availability and flows is assessed. 	Evidence of strength and areas where criteria are fully met: <ul style="list-style-type: none"> availability of baseline data on water availability recorded by agencies like DWR, EGAT and believe that demand and consumptive and non-consumptive water-use, including navigation and fisheries are available.
	Summary of key gaps: No data on <ul style="list-style-type: none"> A hydrological model has been developed for the basin and address different water-use scenarios. The effect of climate change on future water availability and flows is assessed.
B. Energy / power sector planning and regulation: <ul style="list-style-type: none"> Multiple-use projects are prioritised in government options assessment, optimisation and racking studies. 	Evidence of strength and areas where criteria are fully met: <ul style="list-style-type: none"> Purpose of the dam construction from the beginning is the multi-purpose.
	Summary of key gaps:

**FIGURE 11: EXAMPLE OF GAP ANALYSIS FROM RSAT ASSESSMENT AT UBOL RATTANA DAM IN THAILAND (CONTINUE)**

C. Hydropower Projects: <ul style="list-style-type: none"> Hydropower feasibility studies are consultative and seek to enhance design and operational opportunities for multiples-use where feasible. Hydropower projects coordinate with other agencies and water-users in the operations stage to achieve agreed multiple-use objectives. 	Evidence of strength and areas where criteria are fully met: <ul style="list-style-type: none"> There was a hydropower feasibility study before dam construction design enhancement and operational opportunities for multiple-use were covered where feasible.
	Summary of key gaps:
D. Regulation and Governance: <ul style="list-style-type: none"> A water-use framework exists in domestic legislation and international agreements that sets limits, rules and procedures for consumptive and non-consumptive water-use in the basin. Monitoring of water-use is conducted. Regulatory mechanisms exist for the resolution of water allocation conflicts. 	Evidence of strength and areas where criteria are fully met: <ul style="list-style-type: none"> There is a committee to oversee, regulate and monitor water-use at the provincial level.
	Summary of key gaps: <ul style="list-style-type: none"> Not sure how often and how formal the meetings are (refer to topic 1). No data on consumption the framework was found/ not available.

SWOT analysis and identification of priority issues

A core method in the RSAT assessment is the analysis of Strengths, Weaknesses, Opportunities and Threats (SWOT), which is used in all RSAT assessments. SWOT analysis is a qualitative analysis technique that provides a rapid and effective analysis of issues. It draws upon the knowledge and experience of participants, and the information made available to them during the assessment.

In the RSAT assessment, a SWOT analysis is conducted for each Topic; it should be a

SWOT for sustainable hydropower in the basin. The SWOT analysis is best conducted with a facilitator to draw out information from the participants and should be facilitated to encourage dialogue, debate and the sharing of different stakeholder perspectives. The facilitator must ensure that the SWOT analysis is an evidence-based approach and not an opinion poll. The SWOT analysis is conducted after the multi-criteria gap analysis is completed and uses the gap analysis as the basis for the SWOT. An example of a SWOT analysis is given below for Topic 6 under environmental and water quality monitoring:

**FIGURE 12: EXAMPLE OF SWOT ENTRIES FOR WATER QUALITY MONITORING**

Strengths A river basin organization has been established to conduct planning for the river basin.	Opportunities Funding will become available for monitoring from a regional program next year.
Weaknesses There is no baseline data for the river basin.	Threats There is a lack of access to key monitoring sites due to landowner issues

Action Planning

Once the SWOT analysis is completed, the group will develop a list of recommended actions based on the outcomes of the SWOT and the significant gaps and priority issues identified. The list of actions should include actions required to:

- Address significant gaps and priority issues identified during the multi-criteria and SWOT analysis
- Take advantage of opportunities identified in the SWOT
- Build on strengths identified in the SWOT
- Address weaknesses and threats identified the SWOT

It is important to identify responsibility for actions. The facilitator should refer to the mapping of responsibilities for the river basin so that a responsible institution or person can be identified for each action.

In developing actions, the group should also assess how achievable the actions are. For example – “changing national laws and policies” is a difficult action for provincial stakeholders to achieve. Ideally actions identified should

be as specific to the issue and the river basin as possible, achievable and at a level that is relevant to the participants conducting the assessment and the institutions responsible for implementing the action. Some examples are given below and can be used to assist the group to develop specific and achievable recommendations.

Examples of non-specific and difficult to achieve recommended actions:

- Collect monitoring data for the basin
- Improve the biodiversity in the basin

Examples of specific and achievable recommended actions:

- Identify funding opportunities for water monitoring programs by the end of the year
- Install a hydrological monitoring station on tributary X and Y in the next 12 months
- Collect all existing data, reports and monitoring on biodiversity in the basin from universities and government agencies, and develop a summary of biodiversity issues and information gaps for the basin.

FIGURE 13: TEMPLATE FOR A TOPIC SWOT ANALYSIS AND RECOMMENDATIONS

Topic:	
Strength	Weakness (Gaps)
Opportunities	Threats
Recommended Actions	
1.	Responsibility
2.	
3.	
4.	



Group RSAT Worksheet

An alternative to the SWOT analysis is for the participants to develop a more structured and analytical worksheet as shown in Table 13. This worksheet takes the participants through the following stages of discussion and analysis of the issues:

■ Problem Analysis

- What is the problem and the underlying cause? (5 why's? Problem analysis)

■ Consequences of the gaps

- What are the consequences if action is not taken to address the issue - list out as many as possible.

■ Importance

- Give ranking: High, Medium or Low (H, M, L) to each consequence if action is not taken
- Write reason for ranking

■ Recommended Action

- (S.M.A.R.T. Recommendation)
- Responsibility for actions

Table 12 provides a comparison of the two key assessment or dialogue tools

TABLE 12: COMPARISON BETWEEN SWOT ANALYSIS AND GROUP RSAT WORKSHEET (SHOWN IN TABLE 13)

SWOT analysis	Group RSAT worksheet
More open and flexible	More structured, technical and analytical
Useful to encourage dialogue and different perspectives amongst less technical groups when communication & exchange is the main objective	Useful to add technical rigour to dialogue and produce more informed outputs
Group RSAT worksheet is more structured, technical and analytical	Completed by a multi-stakeholder group
Useful to add technical rigour to dialogue and produce more informed outputs	A more analytical approach
Simple, quick and easy to use method	Tends to be more evidence based and less subjective
Suitable for non-technical participants	Requires higher technical input and analysis from participants
Suitable for multi-stakeholder group	Takes more time
Tends to be more subjective	Produces a stronger output
Very effective to stimulate dialogue	
Less structured and evidence based in the analysis	



TABLE 13: TEMPLATE FOR RSAT GROUP WORKSHEET

RSAT Group assessment results – Priority Gaps & Actions					
RSAT Topic: _____ 1-10). Name of basin: _____					Date: _____
Problem Analysis What is the problem and the underlying cause? (5 why's? Problem analysis)	Consequence of gap What are the consequences if action is not taken to address the issue?	Importance Give ranking: High, Medium or Low (H,M,L) Write reason for ranking	Recommended Action (S,M,A,R,T. Recommendation)	Responsibility for actions	
Sub-topic X.1					
Insert “problem or issue”					



Problem analysis

There are several participatory methods for analyzing problems that can be used in RSAT assessments, including:

- ☐ The 5 “Whys”
- ☐ Fishbone analysis
- ☐ Problem tree analysis

Root Cause analysis – 5 Whys : The 5 “Whys” is a method for understanding the underlying cause of a problem, not just the symptom of the problem. It is a simple method that involves stating the problem and then answering a series of questions starting with “Why” to identify the underlying cause. Sometimes it is not necessary to ask “why” five times to get to the underlying cause. Actions to address the underlying causes may be developed into RSAT recommendations.

FIGURE 14: A TEMPLATE FOR THE 5 “WHYS”

5 WHYS TEMPLATE

Clearly State the Problem:

<p>Why did this occur?</p> <div style="border: 1px solid #8B4513; height: 35px; width: 560px;"></div>	<p>Is this a root cause?</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">YES <input type="checkbox"/></div> <div style="text-align: center;">NO <input type="checkbox"/></div> </div>
<p>If no, why did this occur?</p> <div style="border: 1px solid #8B4513; height: 35px; width: 560px;"></div>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">YES <input type="checkbox"/></div> <div style="text-align: center;">NO <input type="checkbox"/></div> </div>
<p>If no, why did this occur?</p> <div style="border: 1px solid #8B4513; height: 35px; width: 560px;"></div>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">YES <input type="checkbox"/></div> <div style="text-align: center;">NO <input type="checkbox"/></div> </div>
<p>If no, why did this occur?</p> <div style="border: 1px solid #8B4513; height: 35px; width: 560px;"></div>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">YES <input type="checkbox"/></div> <div style="text-align: center;">NO <input type="checkbox"/></div> </div>
<p>If no, why did this occur?</p> <div style="border: 1px solid #8B4513; height: 35px; width: 560px;"></div>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">YES <input type="checkbox"/></div> <div style="text-align: center;">NO <input type="checkbox"/></div> </div>
<p>If no, why did this occur?</p> <div style="border: 1px solid #8B4513; height: 35px; width: 560px;"></div>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">YES <input type="checkbox"/></div> <div style="text-align: center;">NO <input type="checkbox"/></div> </div>

Root Cause (Ensure that this is within your control)

Possible Solution:

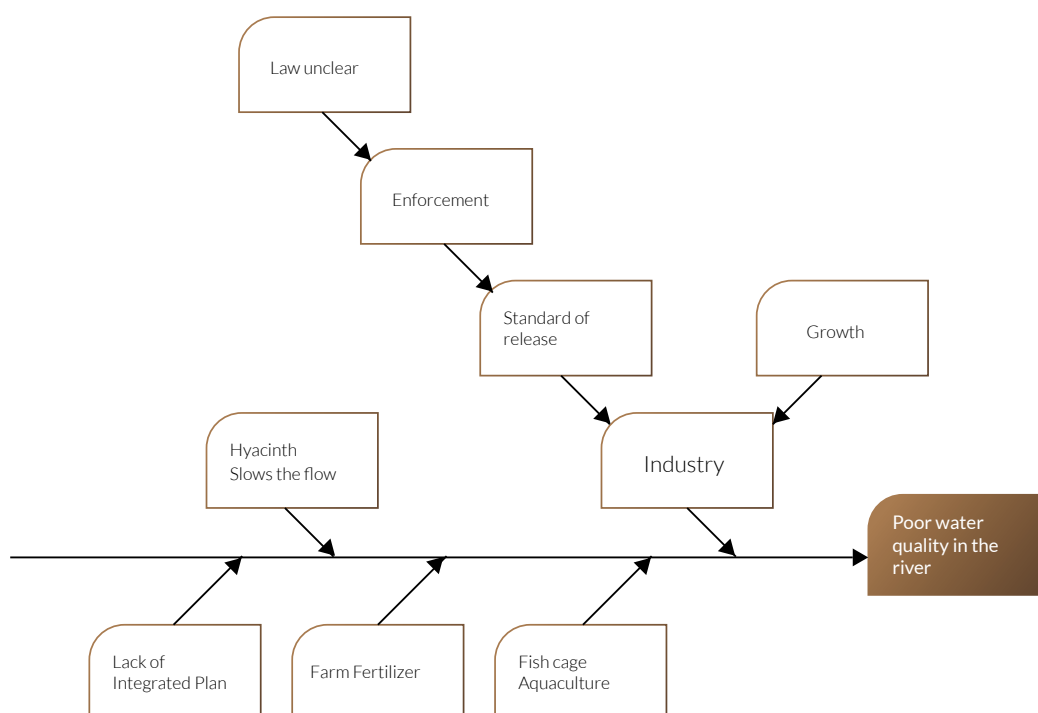
5 "WHYS" EXAMPLE

Issue: People are getting sick when they drink the water in the river

1. **Why** are they getting sick?
Because there is bad water quality in the river
2. **Why** is water quality bad?
Because conditions upstream have changed
3. **Why** have conditions upstream changed?
Because a dam has recently been constructed and a reservoir created,
4. **Why** has the dam and reservoir caused water quality conditions to change?
Because construction activities have released sediments and waste waters into the river, but we don't know how the water quality has changed, and we can not show that the dam is the cause.
5. **Why** don't we know how the water quality has changed?
Because we don't have any Water Quality monitoring data or baselines or and understanding of Water Quality impacts from the dam

Fishbone analysis works in a similar way to help participants understand the cause and effect linkages between issues that have been identified during the gap analysis discussions. In the example below, the causes of deteriorating water quality in the river are identified.

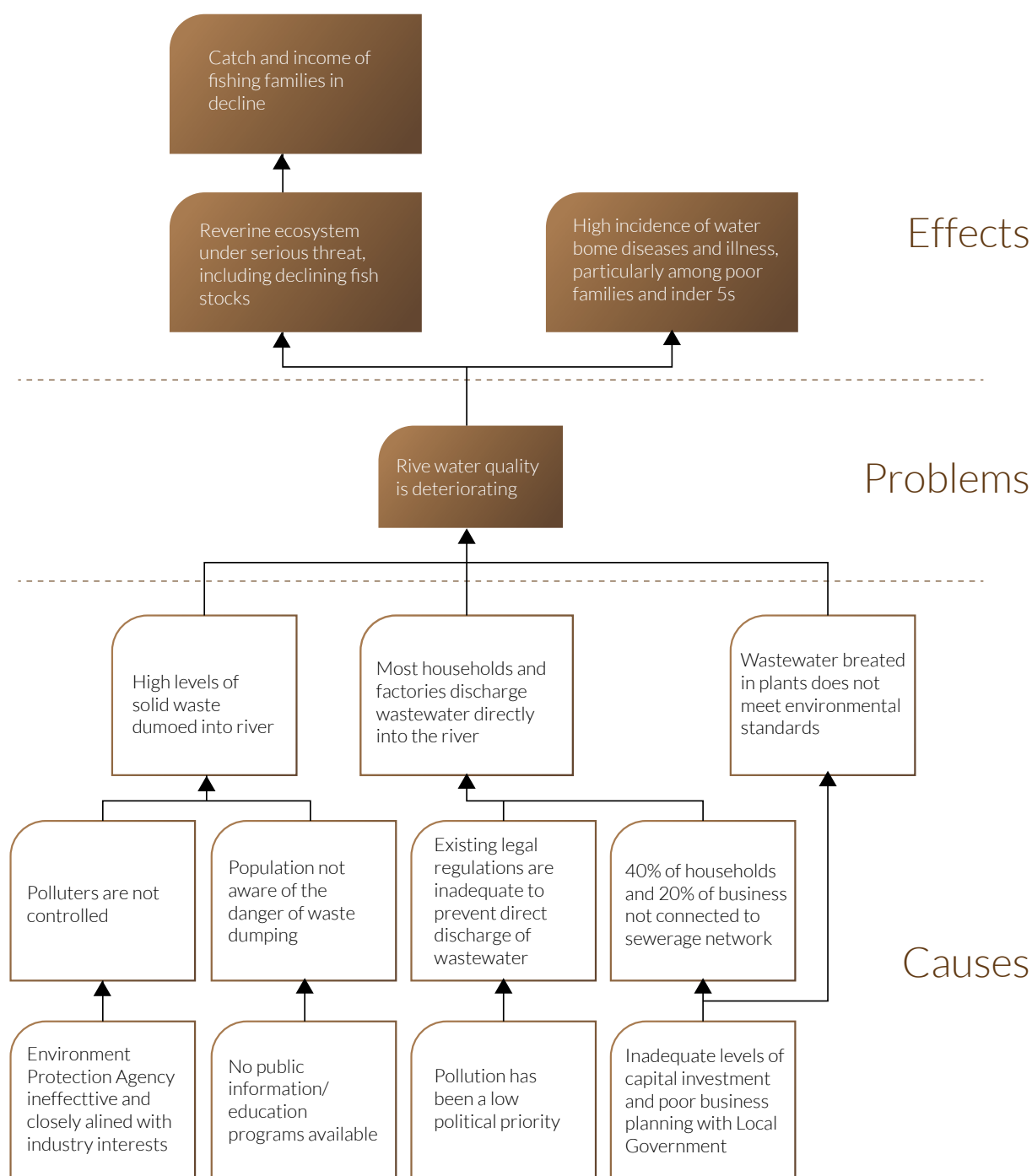
FIGURE 15: EXAMPLE OF FISHBONE ANALYSIS.





A **Problem tree analysis** starts with the perceived problem. In the case below, the problem is the deterioration of water quality. The participants then try to work out what is causing the water to deteriorate, and link this back to underlying causes such as lack of awareness, lack of regulations and enforcement, etc. The third part of the analysis is to link the effects or consequences of the problem continuing unchecked. The problem tree analysis thus links problems with underlying causes, and their effects. The recommendations for action can be focused at any of the underlying causes, as well as trying to address the effects of the problem.

FIGURE 16: EXAMPLE OF PROBLEM TREE ANALYSIS





SMART recommendations

Hydropower and basin-wide issues are complex and often take time to resolve. To work towards greater sustainability in hydropower development in a river basin, fundamental changes and multiple solutions will be required. The participants in an RSAT assessment cannot solve large and complex problems by single actions but they can identify steps to take towards improvement that are **within their ability** to implement. Facilitators should emphasise that the recommendations should be focused on the actions that the stakeholder groups represented by the participants can take.

At the first iteration, the recommendations for action coming out of the RSAT assessments are likely to be a wish list of actions that the different organisations involved should take, e.g. Ministry of Environment and Natural Resources should develop specific water quality monitoring standards and guidance for hydropower. From this wish list, the participants should be encouraged to develop the actions that their organisations can take to facilitate or encourage the action to be taken.

Recommendations should be designed to address issues raised in the SWOT or problem analysis. They should also be contributing towards improving the assessment of the performance statements for the basin. These may include:

- Improving baseline data on the river basin
- Improving impact assessments and management measures
- Improving monitoring
- Raising awareness in different groups of stakeholders
- Setting standards and regulations
- Improving enforcement and compliance
- Reconsidering designs and siting of hydropower plants
- Encouraging better balance and optimisation of hydropower plants with multiple use
- Advocacy for greater sustainability in hydropower plans.

Recommendations need to be S.M.A.R.T.

- **Specific** – clearly defined action and who should undertake it
- **Measurable** – how do we know whether it has been done or completed
- **Achievable** – the action must be within the capacity of the organisation undertaking it
- **Result-oriented** – the action must be focused on providing a solution to a problem or issue concerned with the sustainability of hydropower in the basin
- **Time-bound** – clear definition of the time frame when the action should be taken and the results foreseen



EXAMPLES OF RECOMMENDATIONS FROM RSAT ASSESSMENTS

Bad examples:

- Stop people from drinking the water
- Do some more monitoring and fix the water quality problem
- Collect water quality data

Better examples:

By the end of December:

- Inform community and provide alternatives until WQ issue can be resolved (response)
- Consult with the community & local authorities affected by water quality to find out about the affected river & nature and location of the water quality problem and health issues (baseline & impact assessment)
- Do a review of all possible sources of pollution in the problem area and potential contaminants (impact assessment)
- Identify a budget source to do monitoring to identify cause of health issues if necessary (resources)

By the end of May:

- Seek advice and design a water quality monitoring program (expertise)
- Implement monitoring and analysis at selected sites in the basin based on the above inputs (monitoring and impact assessment)

By the end of June:

- Report to local authorities on the result of monitoring program and make recommendations to address cause of WQ problem (mitigation)
- Raise awareness with local authorities and communities on how to identify, avoid and mitigate water quality impacts in future (avoidance / prevention)





Other resources and sources of information

Mekong River Commission

Presentations available

- Overview presentation of RSAT
- RSAT Topic presentations
- An RSAT Summary Document is available and provides a quick guide to the RSAT including an easy to read overview of the RSAT topics.
- An RSAT Q&A document provides answers to common questions regarding the RSAT.

<http://www.mrcmekong.org/about-mrc/programmes/initiative-on-sustainable-hydropower/rsat-overview-the-basin-wide-hydropower-sustainability-assessment-tool/>

Knowledge Base on Benefit Sharing

This Knowledge Base (KB) was assembled by the Mekong River Commission (MRC) Initiative on Sustainable Hydropower (ISH) in mid-2011 as a first step to implement ISH Output 4.1c, “Benefit-Sharing Mechanisms Elaborated at Regional, National and Community Levels”.

This report is Volume 1 of the KB. The accompanying Compact Disk (CD), called the KB-CD (Ver-1) contains Volumes 2 to 5. The KB-CD has over 120 documents on topics that range from the theory and practice of benefit sharing to case studies and examples of national legislation and regulation.

ISH Output 4.1c supports awareness raising, information sharing and multi-stakeholder dialogue among MRC Member Counties.

One primary aim is to foster a common understanding of evolving experience with benefit sharing and enable Member Countries to cooperate in drawing lessons from experiences today, not only from the Mekong and wider Asian Region, but also from the growing pool of world-wide experience. Version 1 of the KB is a first effort to compile a body of information in one place.

<http://www.mrcmekong.org/assets/Publications/Manuals-and-Toolkits/knowledge-base-benefit-sharing-vol1-of-5-Jan-2012.pdf>

ISH 01 - Identification of Ecologically Sensitive Sub-Basins for Sustainable Development of Hydropower on Tributaries

The ISH01 study on the ‘Identification of Ecologically Sensitive Sub-Basins for Sustainable Development of Hydropower on Tributaries’ aims to contribute to the achievement of the Strategic Priority number 4 of the MRC’s Basin Development Strategy 2011. The Strategy emphasises ‘*the need for evaluation options for development of sustainable hydropower on tributaries, addressing the risks of mainstream hydropower, and assessing alternative energy options to mainstream hydropower*’. In this context, the need to move towards sustainable development of hydropower on tributaries is highlighted through ‘*identifying sub-basins with high ecological value to be protected and those where hydropower can be developed with limited and environmental impacts*’. The outcomes and risk-based approach of the ISH01 study aim to support sustainable hydropower in the Lower Mekong Basin sub-basins, enabling hydropower development and thus the socioeconomic benefits it can provide, while at the same time ensuring the protection of identified Ecologically Sensitive Areas (ESAs) and their environmental quality.



Hence, the hydropower planning and management framework that is being developed within the ISHO1 study aims towards integrated, transparent and balanced decision-making for sustainable LMB development. Large river systems, such as the Mekong and its tributaries have complex dynamic ecosystems, which interact with and are impacted by a range of human activities. Not only do these ecosystems have their own intrinsic value, ecological character and sensitivity, but they also significantly support a variety of livelihoods in their provision of ecosystem services (e.g. fisheries, agriculture, navigation, tourism, etc.). These LMB ecosystem services contribute to the sustainability of the LMB's food security, socioeconomic development and wellbeing. There is no single, common definition for the term Ecologically Sensitive Area (ESA) nor has one been introduced for the LMB yet.

A functioning 'Ecologically Sensitive Area' in the LMB context is defined as an area that

- contains high ecological value/importance (locally, nationally or globally), and, hence
- supports sustainable ecological processes in support of socio-economic and ecological value,
- supports the sustainability of ecosystem services and, hence, livelihoods (ecosystem services),
- is fragile to impacts no matter if human and/or natural, and, hence
- is at possible risk to lose its support of ecological value and processes due to potential impacts.

<http://www.mrcmekong.org/assets/Publications/Reports/2015-07-Final-ISH01-Pilot-Testing.pdf>

ISH 02 - Guidelines for the Evaluation of Hydropower and Multi-Purpose Project Portfolios

The MRC's Initiative for Sustainable Hydropower (ISH) seeks to propose sustainable hydropower considerations which can be integrated into the planning and regulatory frameworks of member countries. The purpose and need for the Guidelines for the Evaluation of Hydropower and Multi-Purpose Project Portfolios (The Guidelines) developed under the ISHO2 Project can be summarized as:

- Current ways of planning hydropower schemes need to adequately take into account their wider social, economic and environmental implications. The key to integration of all costs and benefits into the national strategic planning approach is to identify credible values for these costs and benefits and then to "internalize" them into the normal economic analysis used to compare hydropower and multi-purpose options.
- Multi-purpose uses of dams need to be considered at the outset of project and basin planning.

The Guidelines propose a portfolio planning process with associated tools for valuation and evaluation of hydropower and multipurpose dam project portfolios. Their objective is to assist Member Countries in their basin planning and energy/hydropower planning frameworks.

<http://www.mrcmekong.org/assets/Publications/policies/1.-FINAL-ISH02-Guidelines-v1.5-updated-29Mar2016.pdf>

<http://www.mrcmekong.org/assets/Publications/policies/2.-FINAL-Annex1-ISH02-Economics-Guide-11-26-15-updated-29Mar2016.pdf>

<http://www.mrcmekong.org/assets/Publications/policies/3-FINAL-Annex2-ISH02-Guidelines-9-12-15-updated-29Mar2016.pdf>



<http://www.mrcmekong.org/assets/Publications/policies/4.-Final-Annex3-HPST-User-Manual-11-26-15-updated-29Mar2016.pdf>

ISH 0306: Hydropower Risks and Impact Mitigation Guidelines and Recommendations for the Lower Mekong and Tributaries. (Volume 1)

The Hydropower Risks and Impact Mitigation Manual has been elaborated to support Volume 1. Volume 2 goes into much more detail related to describing risks, impacts and vulnerabilities as well as in describing mitigation options. Volume 2 provides a wide array of examples of good industrial practise mitigation options internationally, from the Greater Mekong Sub-Region (GMS) and the Lower Mekong Basin (LMB). The manual is further supported by a Knowledge Base of data and document files.

In Volume 1, the hydropower risks, impacts, vulnerabilities and associated mitigation identified constitutes 5 major themes, namely:

- Hydrology and downstream flows
- Geomorphology and sediments
- Water quality
- Fisheries and aquatic ecology; and
- Biodiversity, natural resources and ecosystem services

In Volume 2, the structure of the Manual, is basically the same where these issues are separated into Chapters. However, Ecosystem Services has been separated out as a stand-alone Chapter and a Chapter on Engineering Response to Environmental Risks, with good industrial practice example has been included. Multicriteria Evaluation of Mitigation Recommendation and Dam Safety Guidelines is only covered in Volume 1.

As for Volume 1, for the thematic areas above

a set of 5 key common overarching changes related to hydropower development have been identified;

- Annual / inter-annual changes to flow
- Daily / short-time scale changes to flow and water level
- Loss of river connectivity
- Impoundments
- Diversion and intra basin transfers

Risks, impacts and vulnerabilities within each theme (1 to 5) for the changes (I to V) are then listed. The risks, impacts and vulnerabilities are then the basis for the detailed mitigation options proposed within each theme at the various phases during the project life cycle.

<http://www.mrcmekong.org/assets/Publications/policies/1st-Interim-Report-ISH0306-Volume-1-The-Guidelines-Final.pdf>

<http://www.mrcmekong.org/assets/Publications/policies/1st-Interim-Report-ISH0306-Volume-2-Final.pdf>

<http://www.mrcmekong.org/assets/Publications/policies/1st-Interim-Report-ISH0306-Volume-3-Case-Study-FINAL.pdf>

Guiding Considerations on Transboundary Monitoring for LMB Hydropower Planning and Management

This report provides a Guiding Framework for transboundary monitoring of key basin disciplines to assist hydropower decision-making and management. This framework is developed to support the MRC's Basin Indicator Framework. The five main elements of this hydropower-monitoring framework address (1) locations, (2) parameters, (3) timing, (4) information management, and (5) information use. The key disciplines considered



in this report are hydrology, sediments, water quality, aquatic ecology, fisheries and socio-economics. Whilst not fully inclusive of every form of information need, this covers critical areas, and also provides information relevant to many other disciplines.

<http://www.mrcmekong.org/assets/Publications/Reports/MRC-Guiding-Considerations-for-Transboundary-Monitoring-for-LMB-Hydropower.pdf>

Transboundary EIA

A Framework for Transboundary Environmental Impact Assessment (TbEIA) has been developed by MRC to supplement existing cooperation as per the Procedures for Notification Prior Consultation and Agreement (PNPCA). A specific focus of this activity is to better understand conflict resolution in transboundary environmental matters and environmental considerations for sustainable hydropower development. Taking into consideration potential transboundary impacts of some pilot sites, Member Countries are learning how to deal with the issues through dialogue, exchange of information, and capacity building. The experiences and procedures from the pilot projects are expected to improve the draft Framework for TbEIA for the Member States.

Transboundary Integrated Water Resource Management

Mekong IWRMP Transboundary Projects - One of the three components of the Mekong Integrated Water Resource Management Project (M-IWRMP) is the transboundary component that the MRC's four Member Countries implement through transboundary cooperation. In this component, five bilateral initiatives have been set up by the four

countries to address transboundary issues in the management of water and related resources for sustainable development and improved livelihoods.

Bach H, Bird J, Clausen TJ, Jensen KM, Lange RB, Taylor R, Viriyasakultorn V and Wolf A (2012). Transboundary River Basin Management: Addressing Water, Energy and Food Security. Mekong River Commission, Lao PDR. <http://www.mrcmekong.org/assets/Uploads/M2R-report-address-water-energy-food-security.pdf>

Bach H, Clausen TJ, Dang TT, Emerton L, Facon T, Hofer T, Lazarus K, Muziol C, Noble A, Schill P, Sisouvanh A, Wensley C and Whiting L (2011). From local watershed management to integrated river basin management at national and transboundary levels. Mekong River Commission, Lao PDR. <http://www.mrcmekong.org/assets/Publications/Reports/Watershed-Management-report2011.pdf>

GIZ - Network on Sustainable Hydropower Development in the Mekong Countries (NSHD-M).

The NSHD-M is integrated in the project 'supporting the MRC in pro-poor sustainable hydropower development' of the Mekong River Commission (MRC) - GIZ Co-operation programme. The Network was established in October 2012 and brings together universities and research institutions in the Mekong countries Cambodia, China, Laos, Myanmar, Thailand and Vietnam. The network aims to:

- enhance knowledge and skills on sustainable hydropower development (SHD) at academic and research institutions
- share knowledge and experiences on SHD in the Mekong countries



- increase awareness on SHD at all levels of decision-making
- strengthen the capacity of stakeholders, including planners and decision makers, to cope with the challenges of SHD

The network and its activities in the Mekong River Basin are supported by GIZ on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ).

Training materials for the Network

- Climate Change and Hydropower Development:
<http://star-www.giz.de/fetch/7q7X1Q00usge000Q4c/giz2014-1703en-climate-change-hydropower.pdf>
- Sustaining River Basin Ecosystem:
<http://star-www.giz.de/fetch/5qeG5X001M00g4cc0Q/giz2014-0141en-river-basin-ecosystem-hydropower.pdf>
- Hydropower and Economic Development:
<http://star-www.giz.de/fetch/4Q0ur4X0001Q0gW9g7/giz2014-1702en-hydropower-economic-development.pdf>
- Dealing with Social Aspects:
<http://star-www.giz.de/fetch/5qeO5X001M00gdGA0Q/giz2014-0143en-social-aspects-hydropower.pdf>
- Comprehensive Options Assessment:
<http://star-www.giz.de/fetch/9X00qeK3g001MQRy09/giz2014-0140en-options-assessment-hydropower.pdf>
- Transboundary Cooperation and Hydropower Development:
<http://star-www.giz.de/fetch/6Cg6X01M00qgMB00Qe/giz2014-0142en-transboundary-cooperation-hydropower.pdf>

Hydropower Sustainability Assessment Protocol

The Hydropower Sustainability Assessment Protocol is a tool that promotes and guides more sustainable hydropower projects. It provides a common language that allows governments, civil society, financial institutions and the hydropower sector to talk about and evaluate sustainability issues.

The Protocol offers a way to assess the performance of a hydropower project across more than 20 sustainability topics. Assessments are based on objective evidence and the results are presented in a standardised way, making it easy to see how existing facilities are performing and how well new projects are being developed.

What is the Protocol valuable for?

The Protocol has many uses each with distinct value, such as:

- Independent review of sustainability issues
- Guiding sustainability issues
- Comparison with international best practice
- Communication with stakeholders
- Facilitating access to finance
- Preparing clients to meet bank requirements
- increase awareness on SHD at all levels of decision-making
- Reducing risk of investment opportunities.

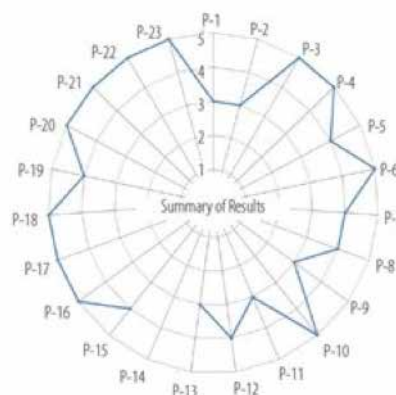
What does the Protocol cover?

The Protocol covers a range of topics that are important to understand the overall sustainability of a hydropower project. The 'spider diagram' below shows the environmental, social, technical and economic aspects which are included. The Protocol also includes 'cross-cutting issues' such as climate



Example List of Topics Assessed:

P-1 Communications and Consultation	P-13 Project-Affected Communities
P-2 Governance	P-14 Resettlement (Not relevant)
P-3 Demonstrated Need and Strategic Fit	P-15 Indigenous Peoples
P-4 Siting and Design	P-16 Labour and Working Conditions
P-5 Environmental and Social Management	P-17 Cultural Heritage
P-6 Integrated Project Management	P-18 Public Health
P-7 Hydrological Resource	P-19 Biodiversity and Invasive Species
P-8 Infrastructure Safety	P-20 Erosion and Sedimentation
P-9 Financial Viability	P-21 Water Quality
P-10 Project Benefits	P-22 Reservoir Planning
P-11 Economic Viability	P-23 Downstream Flow Regimes
P-12 Procurement	



change and human rights, which feature in multiple topics. For each sustainability topic, performance is scored from one to five. Five represents proven best-practice, three represents basic good practice.

When is the Protocol used?

The Protocol can be used at any stage of hydropower development, from the earliest planning stages right through to operation. It has also been designed to work on projects and facilities anywhere in the world. It incorporates four tools:

- The early stage tool, a screening tool for potential hydropower projects
- The preparation tool, which covers planning and design, management plans and commitments
- The implementation tool, used through the construction phase
- The operation tool, used on working projects.

<http://www.hydrosustainability.org/getattachment/7e212656-9d26-4ebc-96b8-1f27eabc2ed/The-Hydropower-Sustainability-Assessment-Protocol.aspx>

Oxfam – Manual for Gender Impact Assessment for hydropower

Balancing the Scales: How Gender Impact Assessment can contribute to gender justice in hydropower development. This manual provides the steps in gender impact assessment. Gender Impact Assessment:

- Gives a voice to women's perspectives, needs and interests
- Ensures gender is considered in planning, risk management and implementation of a hydro project
- Enables projects to be more responsive to women's needs and interests
- If used, dam companies can contribute to promotion of gender equality and women's empowerment
- Will help companies (and government sponsors) to meet their responsibility to protect human rights.

<https://www.oxfam.org.au/what-we-do/infrastructure-people-and-environment/save-the-mekong/gia-manual/>



WWF

Environmental considerations for sustainable hydropower

This was the source document from which RSAT was developed – a collaboration between MRC, WWF and ADB.

http://d2ouvy59p0dg6k.cloudfront.net/downloads/hydropowerdevelopment_mekongregion.pdf

DamRight! - WWF's Dams Initiative Hydropower facts

WWF's top 10 guiding principles for sustainable hydropower:

- Proposals for new hydropower plants must conform to the strategic priorities and policy principles of the World Commission on Dams
- Governments and international agencies must prioritise investment to service the two billion people globally that are without access to electricity. More investment in small-scale, decentralised renewable energy solutions is needed
- CDM and JI hydropower projects should meet Gold Standard criteria
- Some of the remaining unregulated rivers in areas of high conservation value should be designated by governments as “no-go” areas for hydropower schemes
- Siting decisions for new hydropower plants need to consider impacts in the whole river basin and opt for sites of minimum environmental impact
- Efficient hydropower sites that minimise the area flooded per unit of energy produced should be given preference
- The capacity of existing hydropower plants should be upgraded wherever possible, so as to minimise the need for new capacity
- Comprehensive environmental mitigation

measures (such as environmental flow regimes, habitat restoration and protection and fish ladders) need to be included in all planned and existing hydropower plants

- Small hydropower plants can play an important role as a renewable energy source, especially for supplying rural areas in developing countries. However, they must include strict environmental mitigation measures and the cumulative impacts of a large number of small hydro plants must be considered
- Project developers must include all stakeholders in decision-making and ensure fair and sensitive resettlement procedures in accordance with WCD principles.

<http://d2ouvy59p0dg6k.cloudfront.net/downloads/hydropowerfacts.pdf>

Rivers for life - The Case for Conservation Priorities in the Face of Water Infrastructure Development

Effective freshwater ecosystem protection, as well as sustainable management and use of water resources, requires adequate and timely knowledge about areas of conservation value within river systems. Methods for the identification and subsequent prioritization of areas of conservation value – both terrestrial and aquatic – are increasingly available. The World Wide Fund For Nature (WWF) is developing and using such methods to identify priority areas for freshwater conservation and to contribute in guiding sustainable development and human use in river basins, while also protecting important natural assets.

http://d2ouvy59p0dg6k.cloudfront.net/downloads/wwf_guide_water_for_life_web.pdf



ADB

Publication on Sustainable Hydropower in Asia – under development.

This publication aims to ensure that ADB Hydropower projects in Asia have sustainability principles as central objectives during planning and design. It analyses the key reasons for non-sustainable hydropower projects and provides examples of good practice throughout the region.

The World Commission on Dams

Brokered by the World Bank and the World Conservation Union (IUCN), the World Commission on Dams (WCD) was established in May 1998 in response to the escalating local and international controversies over large dams. It was mandated to:

- review the development effectiveness of large dams and assess alternatives for water resources and energy development; and
- develop internationally acceptable criteria, guidelines and standards for the planning, design, appraisal, construction, operation, monitoring and decommissioning of dams.

The World Commission on Dams published its final report, entitled **Dams and Development: a new framework for decision-making**, in November 2000. The report is widely acknowledged as a significant contribution to the debate on dams, not only on the benefits and costs of large dams, but more generally to the current rethinking of development decision-making in a world deeply affected by rapid global change. In particular, its recommendation that decisions on major infrastructure developments take place within a framework that recognizes the rights of all stakeholders, and the risks that each stakeholder group is asked, or obliged to sustain, has been regarded as shifting the dams debate onto a new plane.

<http://www.unep.org/dams/WCD/report.asp>





RSAT

Rapid Basin-wide Hydropower
Sustainability Assessment Tool

2016 Edition



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2016 Edition

Mekong River Basin



Economy



Society



Environment



Energy



Industry

