Mekong River Commission
Cambodia • Lao PDR • Thailand • Viet Nam
For sustainable development

Summary note

Review and Update of Basin-wide Sustainable Hydropower Development Strategy for the Lower Mekong Basin

Draft version 1.0

In an effort to communicate openly with broader stakeholders of the Mekong River Commission (MRC) and to help them participate in MRC's regional stakeholder forums more meaningfully, the MRC Secretariat has prepared this summary report to present key and substantive points from selected on-going technical work of the MRC which is in the process of development and finalization in consultation with its member countries.

31 August 2018

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1. Introduction and Background

Hydropower is recognized as an important development opportunity for the Mekong River Basin and the people living within it. Building on the analysis of previous MRC hydropower studies, the Basin Development Plan (BDP) and the Council Study (CS), the objective of the ***2018 Sustainable Hydropower Development Strategy*** (SHDS 2018) is to identify and analyse alternative hydropower development pathways that enhance benefits beyond national borders and minimize adverse transboundary impacts while supporting water, food, livelihood and energy security.

1.1 The need for a Sustainable Hydropower Strategy

The rapid and large-scale development of hydropower in the Upper and Lower Mekong Basin is forecast to have a substantial impact on the economic, social and environmental condition in the Mekong basin. While the economic benefits for member countries are substantial, it is also known that hydropower and other basin developments (e.g. irrigation) impact the natural resources across the basin. The resulting socio-economic impacts are not equally shared across the MRC Member Countries and are inevitably borne by those who are most dependent on river ecosystems and are vulnerable to these major changes to their livelihoods.

The MRC has studied alternative development pathways as part of the *Assessment of Basin-wide Development Scenarios*[1]. In this analysis a range of Development Scenarios were considered, and the benefits and costs analysed. Focusing particularly on main stream dams, this analysis allowed a comparison of the relative impacts of the alternative Scenarios on environmental and socio-economic indicators. Under the "LMB Long Term Development Scenario" with the Lancang hydropower development and all planned LMB mainstream dams, the loss in capture fisheries was estimated to be 1000kt/year, or 40% of the yield. The majority of this loss was shown to be affecting Cambodia.

Importantly, the Scenario Assessments of the MRC also show that some mainstream hydropower developments have more impact on the fisheries than others[2]. The MRC report indicates that 4.5million people would be at risk of losing livelihoods with a "Severely Negative" impact on livelihoods to those riparian residents.

In addition, the recently completed MRC Council Study has further highlighted these difficult trade-offs.

These major trade-offs in economic, environmental and social values is a major focus of this Sustainable Hydropower Development Strategy.

The intention is that alternative hydropower development pathways are properly considered in this Sustainable Hydropower Development Strategy (SHDS) so that the trade-offs between

[1] Assessment of Basin-wide Development Scenarios, Main Report April 2011

[2] Figure 29, page 59, Assessment of Basin-wide Development Scenarios, Main Report April 2011

economic, social and environmental factors and the "energy, water and food nexus" are understood and openly discussed between Member Countries with a view to a balanced Basin Development Strategy.

1.2 The SHDS 2018 to Link to the Basin Development Strategy

The process of developing the Sustainable Hydropower Development Strategy is set out in the diagram below. SHDS 2018 will form an input to the Basin Development Plan 2021-2025.

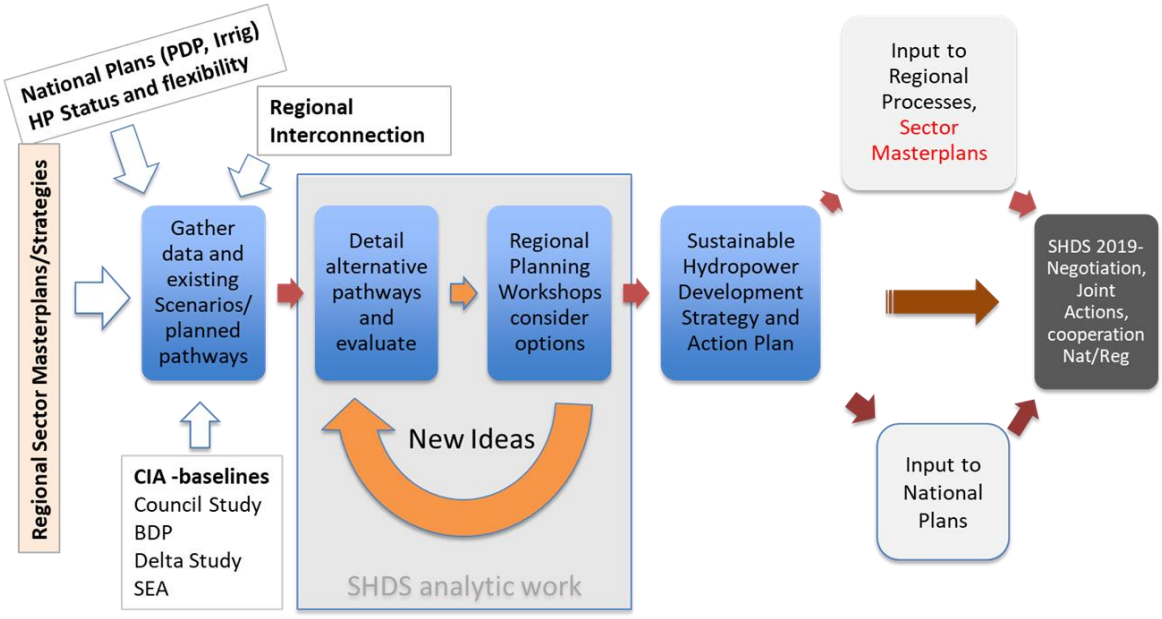


Figure 1: Development process of the Sustainable Hydropower Development Strategy

2. Scope

2.1 Elements to be Explored under the SHDS

The SHDS exploration of the pathways seek to answer the following questions:

- What happens if you proceed with current plans?
- How do benefits and impacts change if you do not allow dams on pristine parts of the basin, thereby emphasizing conservation over maximising hydropower benefits?
- How do benefits and impacts change if you try to strike a balance between maximising benefits and minimising harmful impacts?

There is another set of questions which are not readily answered through the pathways modelling, but which can be looked at through case studies:

- Can some of the harmful impacts be mitigated through design changes, without these leading to increased costs or reduced benefits that outweigh the reductions in harm (the design mitigation question)?

- Can we increase benefits of some projects (for example use the hydro for firming and balancing of wind and solar) so as to maintain similar levels of overall benefits while being able to remove some of the most harmful projects (the benefit enhancement question)?
- Lastly, there are questions around how to share benefits among member countries.
- The sort of conclusions and recommendations which are expected to emerge are:
- The extent to which greater up-front coordination of basin planning and of power sector planning across countries and between water, environment and power ministries can deliver better outcomes (and, from this, the institutional mechanisms needed to make this happen).
- Changes in principles used to assess basin plans and projects to better capture the trade-offs between benefits and impacts (e.g., how to consider wider impacts in project-level feasibility studies and how to weight these in reaching final decisions).
- Additional guidelines which might need to be developed relating to project design that can, in particular, enhance benefits (going above and beyond the MRC's Preliminary Design Guidance and MRC's Hydropower Mitigation Guidelines).
- Identification of any particularly harmful or risky projects (either at sub-basin or individual project level) where development should be put on hold until further analysis and mitigation measures are in place.
- Mechanisms to develop "joint projects" or to allow greater sharing of benefits and, in particular, to compensate "losers" from the gains of the "winners".

2.2 Alternative Perspectives to be Considered in the Pathways

In this study, a 'pathway' is a set of hydropower projects chosen to meet certain criteria. As will be explained in more detail in this section, the pathways are being deliberately chosen to exhibit differences to one another, so that the analysis of the overall impact of the pathways (economic, social, environmental) will provide a spectrum of projected outcomes. Rather than trying to find an ideal pathway to be pursued, the objective is more to obtain ***insights*** into what the crucial factors are, and where the most difficult trade-offs will need to be made over time by the MCs.

MRC has explored alternative development pathways in the past in the context of assessing basin-wide development scenarios, and in particular has recently explored hydropower options as part of the Council Study. The Sustainable Hydropower Development Strategy is an opportunity to take prior analysis to the next stage, exploring in detail the trade-offs involved in hydropower development in economic, environmental and social terms, with careful appraisal of associated uncertainties and risks.

2.2.1 Current Plans Pathway

The LMB hydropower development outlined in the Council Study is represented in the maps below. In Scenario M3, there are 11 mainstream dams commissioned by 2040, with 2 commissioned by 2020, of which 6 planned in Lao PDR, including Xayaburi (under construction), Pak Beng and Pak Lay (both notified), 3 in lower Lao PDR, including Don Sahong (under construction) and 2 in Cambodia. Regarding tributary dams, the Council Study scenarios

include 129 dams commissioned by 2040 with 87 commissioned by 2020, of which 98 in Lao PDR, 14 in Vietnam, 11 in Cambodia and 6 in Thailand.

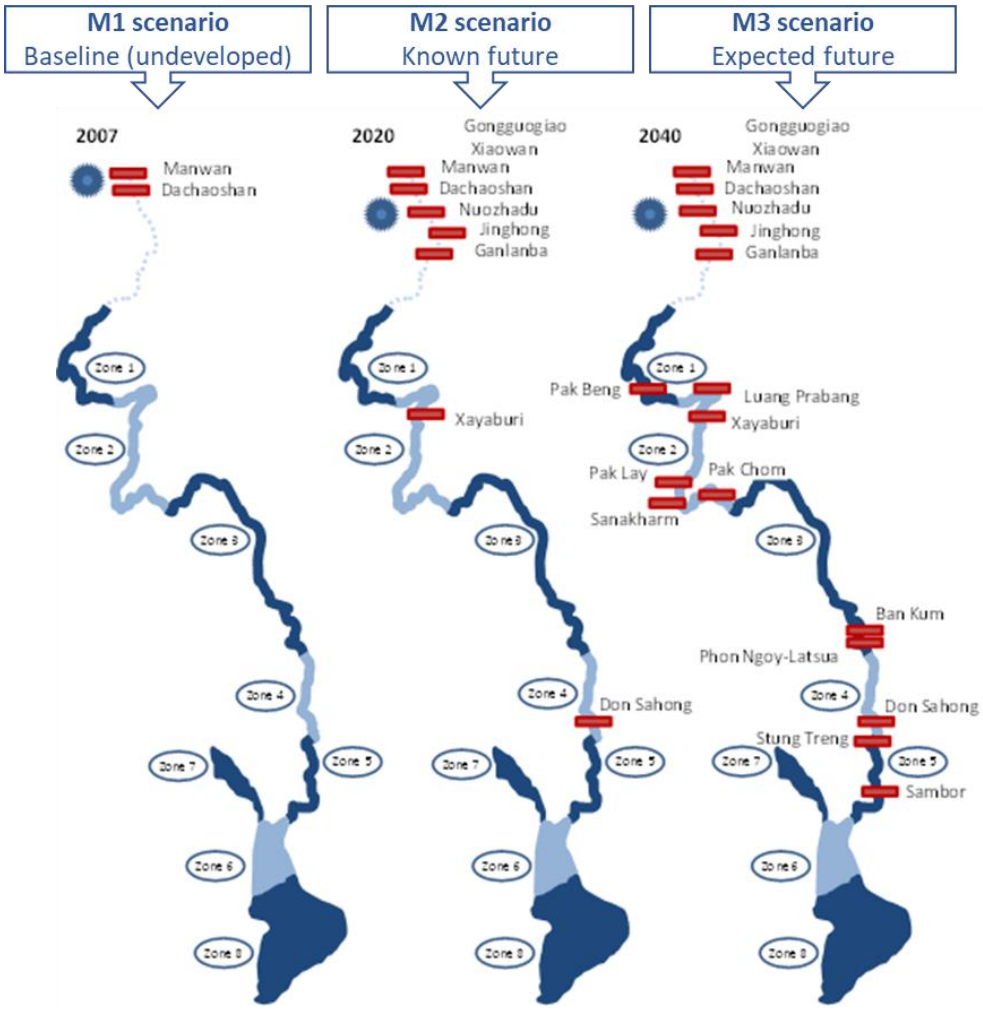


Figure 2: Council Study hydropower development scenarios

Scenario H3 is a modification of M3 to allow the *MRC Hydropower Mitigation Guidelines* to be implemented for new dams and existing projects where this is feasible. In particular, H3 has the smaller version of Sambor (1,700 MW rather than 2,600 MW).

As defined, the Current Plans pathway broadly corresponds to the M3 scenario in the Council Study under which, by 2040, all planned hydropower projects are operational. However, two adjustments have been found to be necessary:

- The list of projects in 2040 under the M3 scenario does not fully correspond to the most recent lists of planned projects from national governments, notably that of Laos.
- The Council Study's M3 scenario considers the status of development as at 2040. It does not identify when individual projects are commissioned—only that they are expected to be operational in 2040. Pathway 1 incorporates estimated commissioning dates.

In developing estimates of hydropower benefits under this pathway, it is also necessary to determine how the development of LMB hydropower projects interacts with existing national

power development plans (PDPs). This is particularly the case for Thailand and Vietnam where current PDPs envisage significantly lower levels of LMB hydropower imports than are implied by current hydropower expansion planned in Cambodia and Laos. Resolving these inconsistencies is important as a means of enabling the full potential benefits of LMB hydropower development to be captured. This is taken further in Section 0 below.

2.3 Defining Alternative pathways

Alternative pathways are to be defined through consideration the perspectives that may drive development. These may weight outcomes based on the perspectives shown in the Figure below.

CURRENT PLANS
Build all planned and proposed projects
Equivalent to Council Study M3 scenario
Represents the 'baseline'

POWER UTILITY PERSPECTIVE
Minimise costs of electricity supply
Avoid resettlement

ENVIRONMENTAL PERSPECTIVE
Protect biodiversity
Protect environmentally sensitive areas
Reduce greenhouse gas emissions

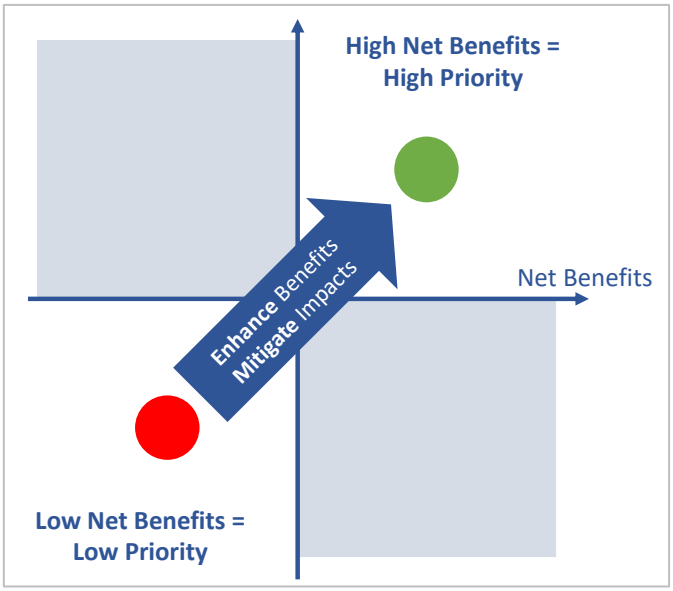
SOCIAL (LIVELIHOODS) PERSPECTIVE
Protect fisheries (for food)
Protect agriculture
Avoid resettlement

Pathways will attach different priorities to individual projects, dependent on

- project-specific benefits and impacts
- trade-offs (weights) on different benefits and impacts under the pathway

Project priority ratings can be increased by:

- enhancing benefits of the project
- mitigating impacts of the project



Mitigating Impacts or Enhancing Benefits may be achieved by:

- Radical design changes and/or re-siting of harmful dams and prioritisation of development of certain projects and sub-basins to maximise benefits while minimising adverse impacts, particularly on unspoilt tributaries and reaches of the main stem.
- Prioritisation of hydropower and alternative generation technologies in the exporting or importing country so that the underlying benefits of the developments are retained while transboundary impacts are reduced.

2.3.1 Environmental Perspective: Conservation Pathway

A Conservation pathway may seek to explore how benefits might change if there is increased emphasis on reducing negative impacts and so would only build projects on tributaries where hydropower has already been developed and away from protected areas and environmental 'hotspots'. It builds on the concepts and processes developed under the MRC ISH 01 studies, Identification of Ecologically Sensitive Sub-Basins for Sustainable Development of Hydropower on Tributaries where candidate Ecologically sensitive areas were identified and then mapped with existing pressures and threats including potential hydropower projects.

The concept behind the Conservation Pathway is best illustrated by the diagrams below, where the principle of avoiding building dams in environmental hotspots or protected areas, or in rivers that are not already compromised by existing dams. The ecologically sensitive areas of the LMB are identified in Error! Reference source not found..

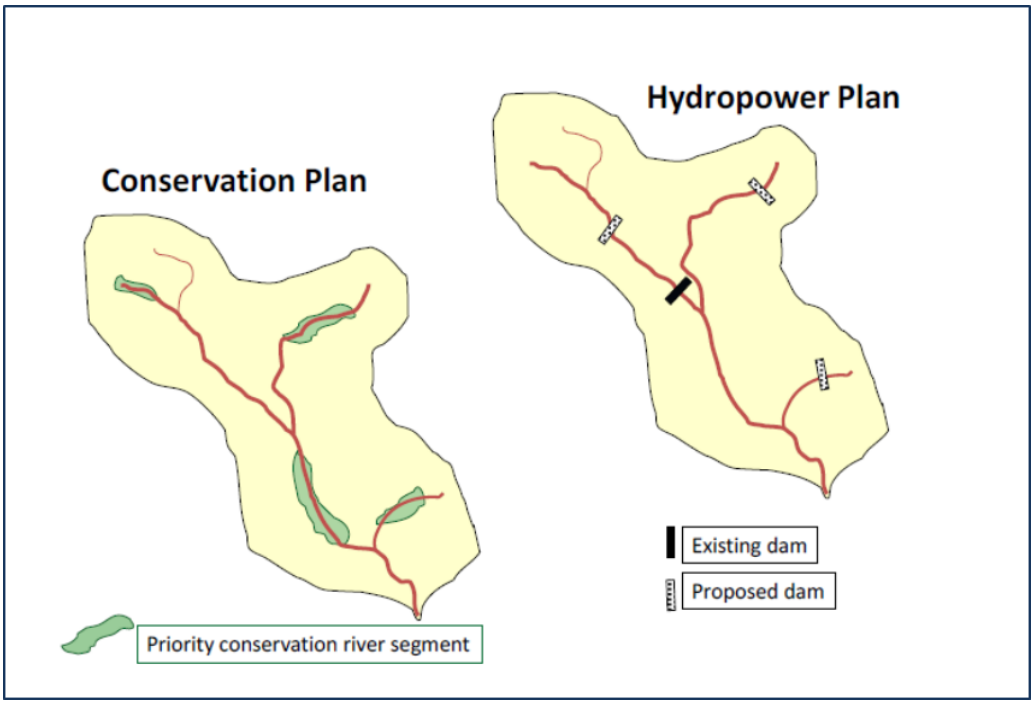


Figure 3: Separate Hydropower and Conservation plans with protected areas and hotspots

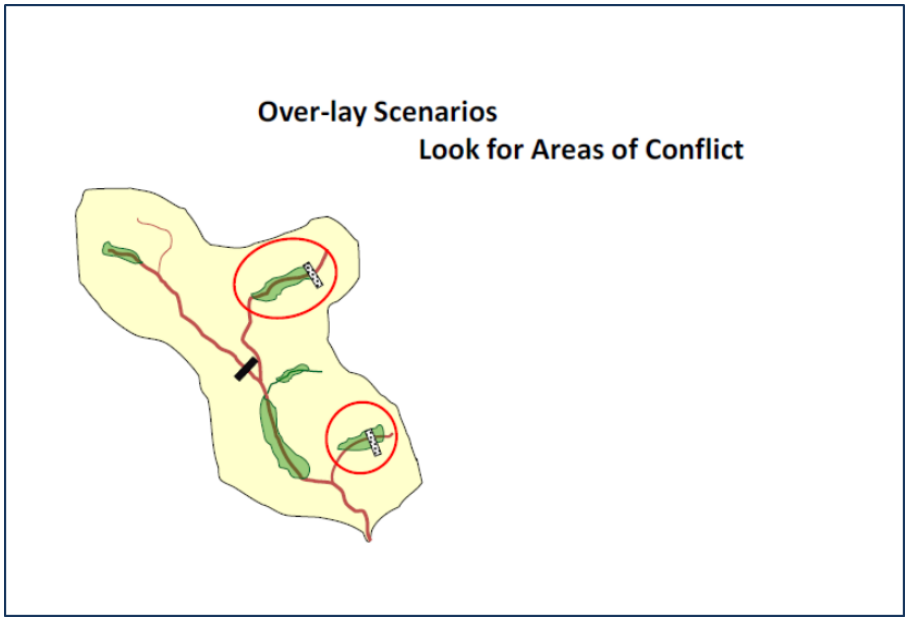


Figure 4: Overlaying the dams and the Protected Areas and Hotspots

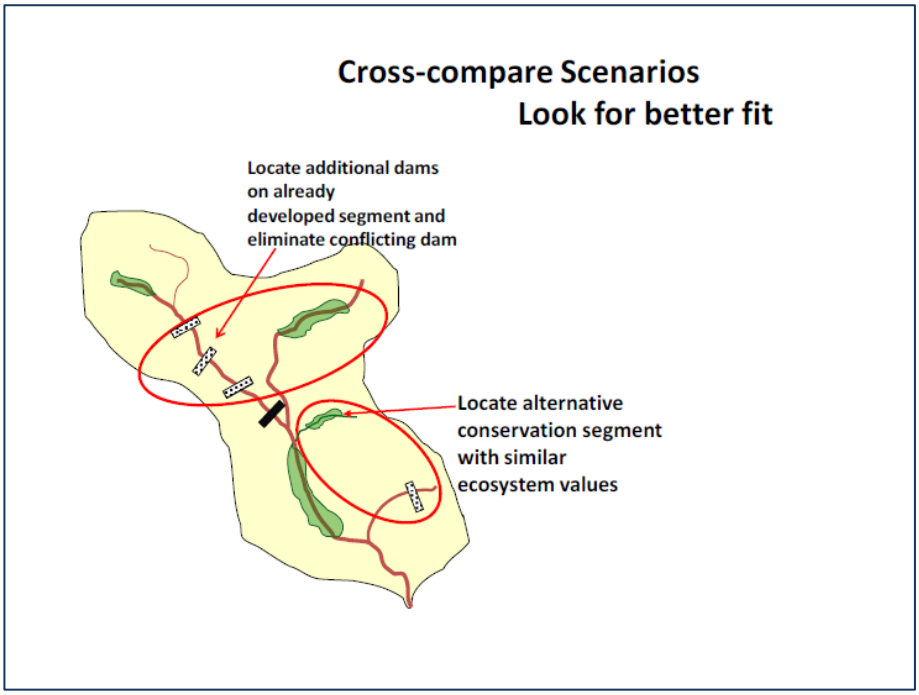


Figure 5: Trying to locate dams where there is no conflict between conservation and hydropower

Source: Inter-American Development Bank and The Nature Conservancy (2013), *The Next Frontier of Hydropower Sustainability: Planning at the System Scale*, Washington DC

To derive the Conservation Pathway, the indicators given high weights will be those tracking the degree to which proposed dams would fall into protected areas or environmental hotspots or would reduce connectivity. These indicators form part of the overall selection tool which has been developed and the process of identifying projects to be included or excluded from different pathways is described in the next section.

3. Approach and Methodology

3.1 SHDS analytic work

The core of the SHDS study is the analytic work that is being carried out on the Pathways. Preliminary ideas for the analytic component of the SHDS study were discussed at a Regional Consultation with member countries in Vientiane in May 2018. A streamlined approach been developed, which has 4 main steps:

1. ***Preliminary Project Screening*** for inclusion in pathways; this involves a first set of indicators covering economic, social, environmental and conservation indicators.
2. ***Pathway Definition,*** partly through using the SHDS Pathways Model, which allows weights to be assigned to the screening indicators, composite indicators calculated, and a cut-off point assigned for projects to be included in different pathways; to complete the pathway definition, the project lists from the model will be scrutinised and manually refined on the basis of knowledge of specific projects.
3. ***Pathway Analysis***, using the electricity sector models for the hydropower benefits and a set of pathway comparison indicators for the social and environmental impacts; these indicators are different those used for the initial project screening. Some of the pathway indicators have monetary values, while others are qualitative. A weighting scheme allows composite assessment that also incorporates risk.
4. ***Synthesis of the overall SHDS*** and development of the Joint Action Plan.

These steps are illustrated in the Figure below.

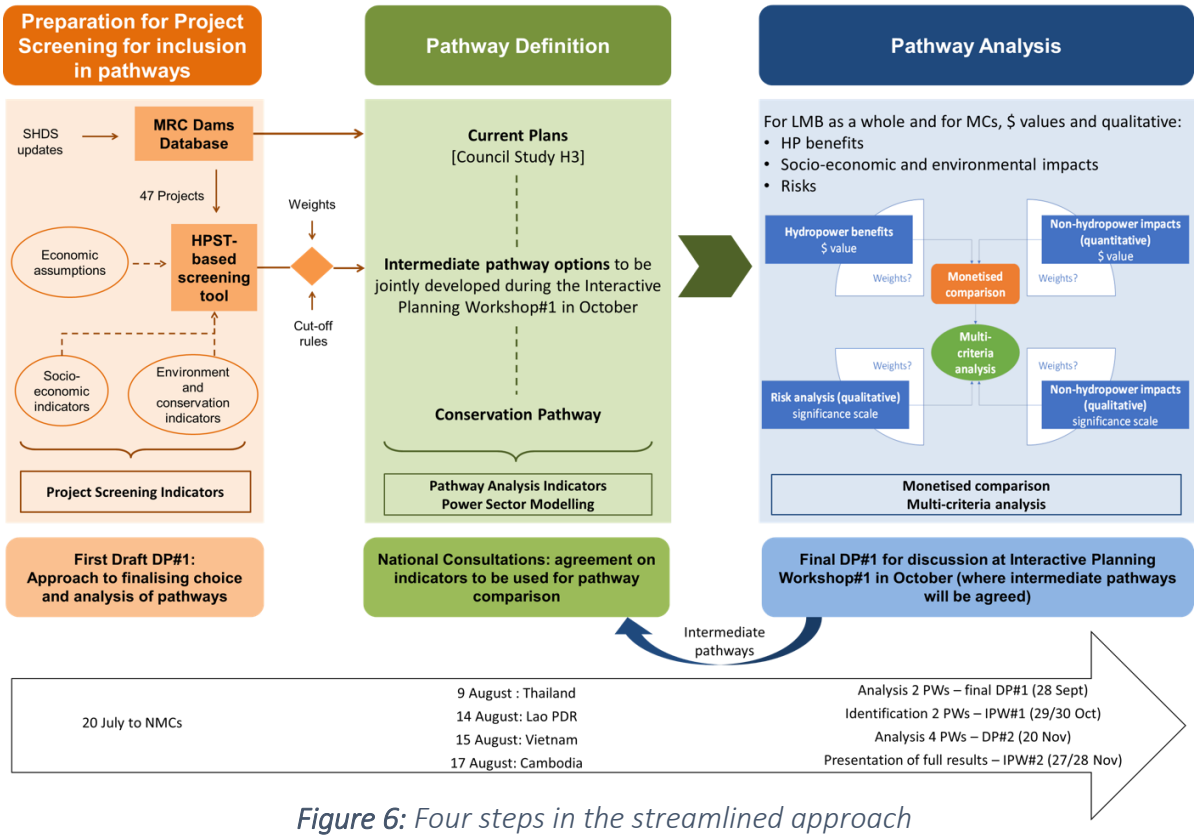


Figure 6: Four steps in the streamlined approach

3.3.1 Analytic tools

In addition to introducing the specially developed Pathways Model, the power system models and a selected list of indicators are to be used for comparison of the pathways:

- The interactive ***Pathway Model*** allows participants at the National Consultations and the Interactive Planning Workshop #1 to explore the options for intermediate pathways by experimenting with different combinations of weights and cut-off points. This is a tool for informing the discussion of pathway options, but, as already explained, the definition of a pathway for detailed analysis will not rely solely on the model. Rather, the model's project list will be manually refined on the basis of knowledge of specific projects.

- The ***power system models***, which have now been populated with data (often generic data where no specific data was supplied), are well adapted for the sort of analysis that is needed (analysis of the consequences of replacement of components of the national power development plans by hydropower).

- The ***list of indicators*** is based on the Indicator Framework developed for MRC in March 2018; it includes technical and economic details of the hydropower project, with the main indicators covering multiple dimensions of the social, environmental, economic and climate change aspects of the projects. In an Annex, a more extensive list of indicators is provided.

The pathway definition also has to consider the need to harmonise intended levels of hydropower development with the national power development plans. In particular, this may entail Thailand reducing investment in gas generation and Vietnam in coal generation.

3.2 Developing sustainability indicators for comparing pathways

3.2.1 Indicator overview

A comprehensive set of indicators have been developed to compare the sustainability of the different pathways considering a wide range of indicators drawn from the Sustainable Development Goals, the Rapid Sustainability Assessment Tool, Water-Food-Energy nexus trade-offs, the criteria used in BDP assessments and the Council Study.

The indicators chosen will be organised into groups, following the same logic as the report to the MRC entitled *Towards a sustainable and cost-effective Indicator Framework for the Mekong River Commission* prepared in March 2018[3]. This will make it possible to develop comparisons of the pathways using radar diagrams for the relevant groupings of indicators, while at the same time being consistent with the framework of indicators being established by

[3] Benjamin Docker, Malcolm Wallace, John Sawdon and Peter Droogers. March 2018 *Towards a sustainable and cost-effective Indicator Framework for the Mekong River Commission*

the MRC. The groupings of strategic indicators in this framework are summarised in the figure below.

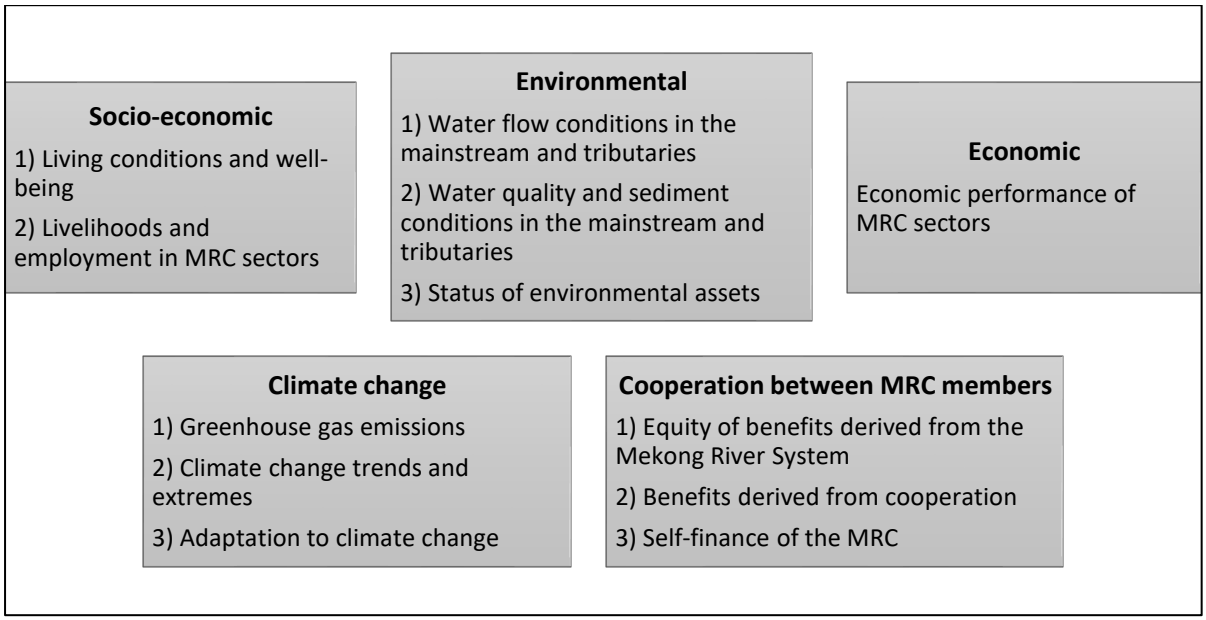


Figure 7: MRC strategic indicator framework

Some of the indicators suggested in this framework are not relevant for the SHDS, while others would have much the same values across the different development pathways. Specific indicators have therefore been developed to highlight the differences between the pathways.

3.2.2 Summary of Indicators to Evaluate Pathways

The Table below indicated the summarized indictors that are proposed to be used to compare the pathways. As noted in Section 3.1, these indicators will be used within a multicriteria assessment to assist member countries and stakeholders understand the trade-offs between pathways. In addition, the multi criteria assessment will use different weightings on each of the indicators, selected by the stakeholders, that may affect the ultimate choice of future strategy based on different national or stakeholder perspectives.

The Pathway Analysis Indicators proposed in the Table below will be evaluated using a more detailed breakdown of indices and GIS and related planning tools arising from recent research in the basin. The evaluation will also draw on the findings of the Council Study and Mekong Basin research.

Table 1: Proposed Indicators to Evaluate Pathways

CATEGORY	TYPE	SCREENING INDICATORS		PATHWAY ANALYSIS INDICATORS	
SOCIAL (LIVELIHOODS)	Transboundary	I	Connectivity	1	Connectivity
				2	Value of fisheries
				3	Sediment flows (has impacts on fisheries and agriculture)
				4	Persons affected downstream
				5	Flood control potential
	National	II	Displaced persons	6	Displaced persons
				7	Employment
				8	Irrigation potential
ENVIRONMENT	Transboundary	III	Flooding of environmental 'hotspots'	9	Flooding of environmental 'hotspots'
				10	Fish diversity
				11	Length of downstream impacts (km of affected river)
	National	IV	Flooding of Protected Areas	12	Flooding of Protected Areas
				13	Lost land (differentiated by type)
CLIMATE CHANGE	Transboundary	V	GHG savings (*)	14	GHG savings (**)
				15	Vulnerability to climate change
	National		--		
ECONOMIC	Transboundary	VI	Levelised Cost of Energy	16	Electricity generation costs
				17	Navigation
	National		--	18	Macro-economic impacts (GDP and export earnings)
				19	Government revenues

3.2.3 *Taking account of risk and overall basin-wide pathway evaluation*

The final step depicted in the Process Diagram is to arrive at a consolidated comparison between the different pathways. As already explained, the overall assessment of net benefits will necessarily involve combining hydropower and non-hydropower factors which are readily monetised with qualitive risk factors and non-hydro impacts that will be analysed through multicriteria analysis. There will be provision for different weights to be applied, so as to be able to demonstrate the impact of applying different priorities and to clarify which factors are most significant in determining the choice of pathway.

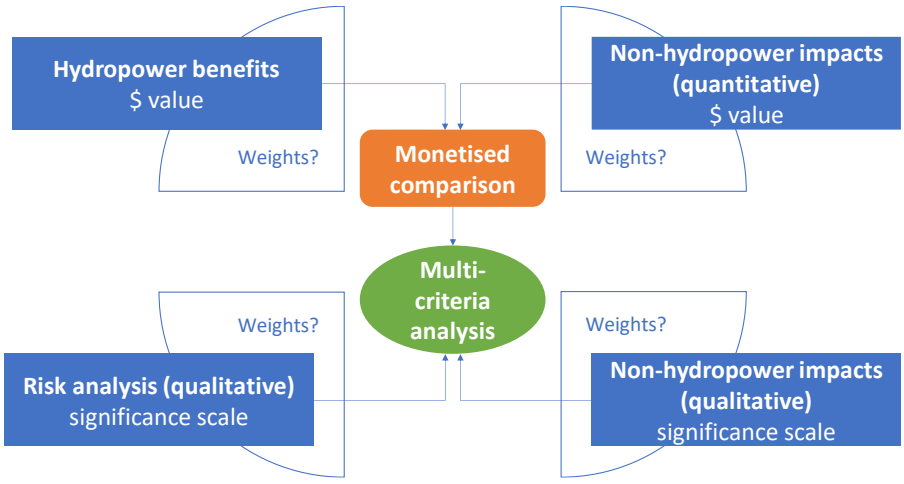


Figure 8: Framework for consolidated pathway comparisons including risk

There are a range of factors to be considered in applying weightings. These include:

- *Certainty and reversibility* – there is a case for impacts that are more uncertain to be given a higher weight. This also strongly applies to impacts which are permanent, particularly irreversible environmental damage.
- *Income distribution* – impacts that disproportionately affect low income / more vulnerable groups might be given higher weights.

The weights to be applied in this final consolidated comparison of the Pathways will be discussed with the participants at the regional Interactive Planning Workshop #1 at the end of October. Another interactive model will be provided to make the trade-offs transparent.

3.2.4 Taking account of gender

Women and men will be differently affected by hydropower development given their different levels of dependence on the resources provided by the river, on the use of the river for services such as cleaning and on the ability to market and derive income from the river (e.g., from fish sales). Women are also disproportionately impacted when communities have to move to make way for a hydropower reservoir.

However, being able to distinguish differences in impacts by gender of hydropower development depends on access to suitable data. Unfortunately, there is a lack of gender-specific data which can be used to precisely score different pathways from a gender perspective. However, it is proposed to have a gender index that is composed of a weighted sum of indicators which relate to impacts that are likely to fall predominantly on women. Our initial suggestions are as follows:

- ***Persons displaced***: women as a proportion of the population in or near planned reservoirs likely to be displaced.

- ***Persons affected***: women as a proportion of the population downstream of dams to next major confluence where the mean annual flows are more than 130% of flow at dam site.

- ***Access to the river and water***: women who use the river for bathing and water supply would be most affected by hydropower. This would be captured under the persons displaced and affected.

- ***Lost land – Forest***: importance of forests for providing non-timber forest products (NTFPs) for domestic consumption and sale. Collectors of NTFPs are predominantly women - this would be factored by persons displaced.

- ***Lost land – Agriculture***: especially lost upland cultivation (indicated by persons displaced) and river bank gardens (indicated by persons affected) - lost paddy land would be omitted as being less gender sensitive.

- *Fisheries*: harvesting of fish and other aquatic animals from wetland and paddy land is an important component of women's livelihoods, contributing especially to domestic consumption and good nutrition.

- *Sediment*: less easy to associate with women's livelihoods, excepting in general health of the river and bank erosion - but this would be captured under an assessment of river bank gardens affected.

4. Broader SHDS issues

4.1 Alternative Energy Options

The main challenge faced by the system modelling analysis is to combine the need to respect the current Power Development Plans (PDPs) defined by each country, while offering the best solution to modify such PDPs for each hydropower pathway. The approach is not to produce new least cost plans for each MC, but to analyse the costs and benefits within the power sector of changing the level of hydropower development. The models being deployed are very suitable for this purpose.

The approach selected to measure the impact of each pathway on each of the national PDPs is based on two steps:

1. For each pathway establish a set of alternative minimum changes to current PDPs that will preserve the same level of system reliability as the original PDP.
2. Model each alternative of minimum change and select the generation option which yields the least cost.

The result of this process may not be a least cost sequence of capacity additions, only the change relative to the original PDP is guaranteed to be the least cost change.

The assessment will consider the alternative energy option being considered by importing countries including renewable energy, coal and gas. Attention will be paid to the current trend and reducing costs of relevant renewable technologies.

4.2 Harmonising hydropower development with national power development plans

The issue of having to harmonise the level of hydropower development in the exporting countries (Lao PDR and Cambodia) with the importing countries (Thailand and Vietnam) has already arisen in connection with the assessment of the Current Plans Pathway. Essentially the plans of exporting countries are note matched in the PDPs of the importing countries.

The tables below provide the data relating to national Power Development Plans and the Current Plans Pathway, as at 2030 and 2040. Each table is organised to show both the location of the capacity (“from”) and the market which it is used to supply (“to”).
The proposed approach to reconciling the Current Plans pathway and the national PDPs for Thailand and Vietnam is currently under consideration.

CURRENT PLANS PATHWAY

2030

MW	From				
To	**Cambodia**	**Laos**	**Thailand**	**Vietnam**	
Cambodia	1,247	85	-	-	**1,332**
Laos	-	7,602	-	-	**7,602**
Thailand	-	11,739	745	-	**12,484**
Vietnam	-	841	-	2,607	**3,448**
	1,247	**20,268**	**745**	**2,607**	**24,867**

2040

MW	From				
To	**Cambodia**	**Laos**	**Thailand**	**Vietnam**	
Cambodia	1,620	85	-	-	**1,705**
Laos	-	7,602	-	-	**7,602**
Thailand	-	11,739	745	-	**12,484**
Vietnam	3,150	841	-	2,607	**6,598**
	4,770	**20,268**	**745**	**2,607**	**28,390**

NATIONAL PDP IMPORT PLANS

Planned

MW	From				
To	**Cambodia**	**Laos**	**Thailand**	**Vietnam**	
Cambodia	1,620	-	-	-	**1,620**
Laos	-	7,602	-	-	**7,602**
Thailand	-	4,274	745	-	**5,019**
Vietnam	-	1,554	-	2,607	**4,161**
	1,620	**13,430**	**745**	**2,607**	**18,402**

Difference from Current Plans pathway - 2040

MW	From				
To	**Cambodia**	**Laos**	**Thailand**	**Vietnam**	
Cambodia	-	(85)	-	-	**(85)**
Laos	-	-	-	-	**-**
Thailand	-	(7,465)	-	-	**(7,465)**
Vietnam	(3,150)	713	-	-	**(2,437)**
	(3,150)	**(6,838)**	**-**	**-**	**(9,988)**

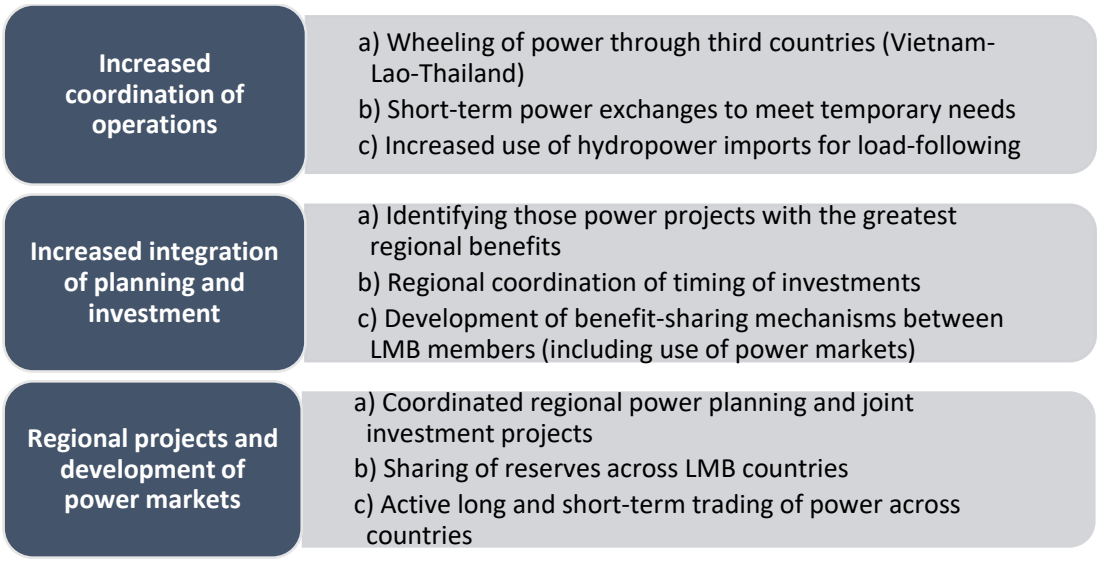
Figure 9: Harmonizing PDP with the Council Study hydropower development scenarios

4.3 Regional power system integration

At present, the power systems of the LMB countries operate more-or-less independently of each other. Rather than major interconnectors creating a regional grid, there are only small border exchanges and dedicated power lines from individual export-oriented generation projects to inter-connection points in the national grid of the importing country.

As has long been recognised under the Greater Mekong Sub-region (GMS) initiative, the countries could realise substantial gains by establishing an inter-connected grid in the region and progressively deepening the degree of power sector integration. Some measures are

already being implemented under the Regional Power Trade Coordination Committee (RPTCC), but major steps would include:



Deepening power sector integration in GMS is significant for the SHDS because it will entail making better use of existing power infrastructure across the region, thereby reducing the need for hydropower developments, which will inevitably impose social and environmental costs (even with mitigation in place).

An important step towards deepening regional power system integration would be for the countries to jointly develop power projects, particularly interconnectors which will promote the formation and consolidation of the regional grid. Interconnector projects typically involve relatively small outlays, but which can unlock significant savings through postponing much more costly generation investments. Interconnector projects are difficult to implement unless there is a high level of cooperation between the countries involved. ***This would be facilitated by the interconnector projects being from the start joint projects.***

4.4 Potential for multi-purpose hydropower development

The guiding themes for SHDS are the enhancement of transboundary benefits and the minimisation of adverse transboundary impacts. In this context, multi-purpose dam projects have obvious potential in enhancing the benefits of dams built primarily for hydropower, and there may also be scope in multi-purpose dams for reducing negative impacts.

For example, adding multi-purpose functionality such as pumped storage, irrigation and flood control will increase the benefits of a project originally conceived as a pure hydropower project. Similarly, irrigation projects would provide employment for basin residents displaced by dam construction, thereby ameliorating some of the social costs.

4.5 Alternative ways of generating foreign currency

For Cambodia and Laos, the building of hydropower dams is not just for energy generation and the sort of multi-purpose options just mentioned but is also motivated by wanting to diversify their national sources of foreign exchange. The problem is that if the hydropower projects are owned and operated by private firms from the importing countries, the exporting countries may receive quite small amounts of foreign currency earnings (from royalties and taxes), while incurring significant social and environmental costs.

Consideration may therefore be given to using the natural resources of the Mekong in different ways that may be more remunerative in foreign currency terms as well as less damaging. A case in point, linked to the Conservation Pathway, would be to develop the pristine tributaries and unspoilt reaches of the mainstream for high value eco-tourism. This would also be labour intensive, offering many employment opportunities to basin residents, and having significant multiplier effects into the domestic economy.

By the same token, however, tourism can also be developed around the lakes formed by hydropower projects with water storage. This would be a different form of tourism, probably with more of a domestic and regional character. This may be less profitable in foreign currency terms but would still generate significant employment and linkage effects.

5. Consultation and Cooperation

The study will be executed in a consultative and participatory manner. For the final outputs to be useful, they must be understood and seen as relevant by the key stakeholders in the region, and in particular by the developers and agencies responsible for different aspects of strategic planning and project implementation in the hydropower sector. The team will establish strong links with these agencies and with the four National Mekong Committees at the earliest opportunity and will involve these agencies and developers in discussions at all stages of the execution of the study so that they are fully familiar and in agreement with the project outputs before they are finalized.

5.1 Stakeholder Interactive Planning Workshops

Interactive Planning Workshops with Member Countries are envisaged to explain the development pathways and determine if further pathways should be considered. A number of alternative sustainable hydropower development pathways may be proposed from the outputs of the Workshops to be evaluated and relevant costs, benefits and indicators outcomes documented.

Additional interactive planning workshops with Member Countries may be facilitated to explain the outcomes of the follow-up assessment and determine if further pathways should be considered. Selected options for development pathways, with their impact on basin Needs, Opportunities and Challenges (using Basin Indicator Framework), will be provided to Member Countries for consideration as part of the Basin Strategy.

5.2 SHDS2018 as Input to National and Basin Planning

Outputs from the Stakeholder Workshops will be documented to provide detailed descriptions of sustainable hydropower development pathways for Basin Strategy work and provided to the MC for input to National Planning processes. The intention would be to provide the Strategy to high level Council Meeting with the SHDS2018 for their guidance.

6. Timeline

The timetable for the remainder of the study is shown in the diagram below.

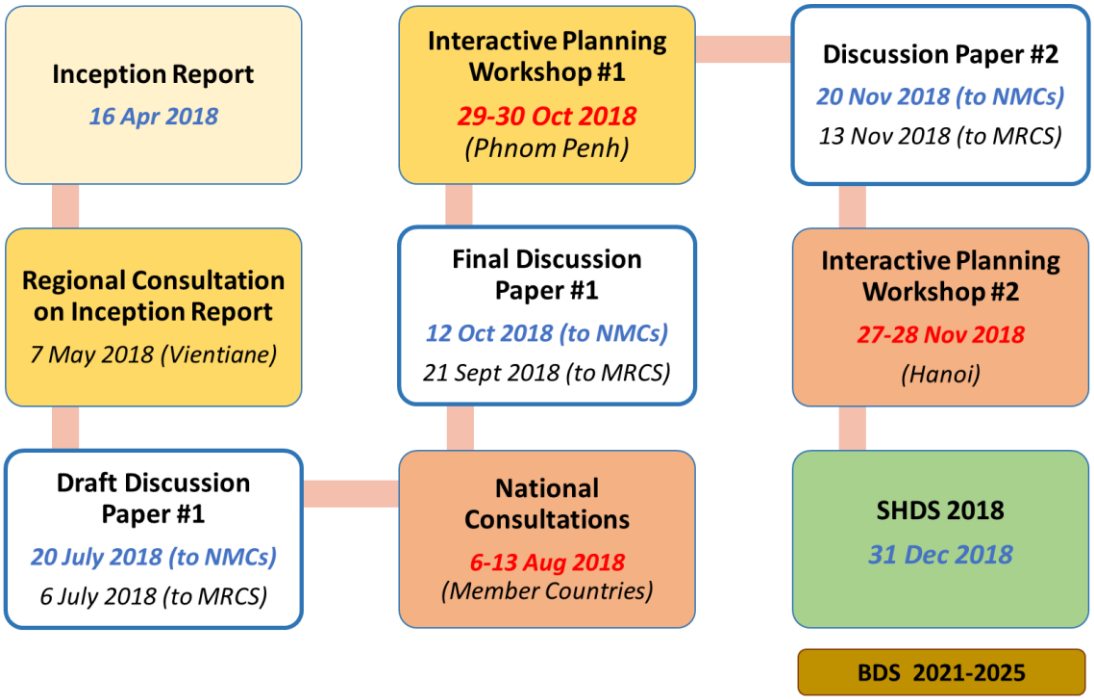


Figure 10: Timeline of the remainder of the study

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