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MEKONG RIVER COMMISSION

STUDY ON THE SUSTAINABLE MANAGEMENT AND DEVELOPMENT OF THE MEKONG RIVER, INCLUDING IMPACTS OF MAINSTREAM HYDROPOWER PROJECTS (COUNCIL STUDY)

EXECUTIVE SUMMARY

Council Study Interim Reports

DRAFT

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EXECUTIVE SUMMARY

BACKGROUND

The fundamental objective of the 1995 Mekong Agreement is to achieve “the full potential of sustainable benefits to all riparian countries and the prevention of wasteful use of Mekong River Basin (MRB) waters.” This objective is complemented by the Shared Vision for “an economically prosperous, socially just and environmentally sound Mekong Basin.” Achieving this objective towards the shared vision requires a fundamental understanding of the positive and negative social, environmental, and economic impacts of water resources development across sectors and borders.

Since 1995, the Mekong River Commission has been involved in the collection of data and the development of models, both conceptual and mathematical, aimed at improving and demonstrating the understanding of the functioning of the Lower Mekong Basin (LMB) ecosystem, and the linkage between the people and the river. Many studies have been conducted, however many knowledge gaps still remain including the impacts of water resources developments on the river ecosystem and on the value of ecosystem services to society. In essence, the most important knowledge gaps on impacts of water resources developments in LMB are expected to be addressed by the Study on Sustainable Management and Development of the Mekong River including Impacts by Mainstream Hydropower Projects (hereinafter referred to as the Council Study) through a comprehensive and systematic basin-wide assessment framework and methodology. Through this methodology, the current uncertainties in assessing the impact of different development opportunities in the LMB can also be addressed. By closing the most important knowledge gaps and improving the certainty of predictions of impact from major developments in the Mekong River Basin, the countries will be in a better informed position to cooperate towards sustainable development and management of the Mekong River Basin.

Origin of the Council Study

At the First MRC Summit on 5 April 2010, MRC Member Countries’ Prime Ministers reaffirmed their strong political commitment to implement the 1995 Mekong Agreement with the Hua-Hin Declaration. Subsequently, based on the outcome of the verbal discussion between the Member Countries’ Prime Ministers at the 3rd Mekong- Japan Summit on November 2011, the Council of the MRC during 18th Council Meeting on December 2011 agreed in principle to implement a study on sustainable management and development of the Mekong River Basin including impacts of mainstream hydropower projects.

In response to the Council’s decision above, a Concept Paper on January 2013 and subsequently a Terms of Reference on January 2014 was developed by MRC Secretariat, endorsed by the Council Study Regional Technical Working Group (RTWG), and approved by the Joint Committee. On October 2015, the Inception Report of the Council Study was approved by the RTWG which served as the basis for the implementation of the Council Study.

OBJECTIVES AND SCOPE

The Council Study has three objectives as follows:

Objective 1: Further develop/establish a reliable scientific evidence base on the environment, social and economic consequences (positive and negative) of development in the Mekong River Basin.

Objective 2: Results of the study are integrated into the MRC knowledge base to enhance the BDP process providing support to the Member Countries in the sustainable management and development of the Mekong River Basin.

Objective 3: Promote capacity and ensure technology transfer to Member Countries in the process of designing and conducting of the study.

Objective 1 is generating new knowledge and refining existing knowledge to close the most important knowledge gaps; and addressing the uncertainties in the generation of new knowledge through the development of a comprehensive systematic basin-wide assessment framework and methodology. Objective 2 is to effectively disseminate and use new knowledge by MRC and the Member Countries through the MRC knowledge base and the basin development planning process. Objective 3 is to enhance the capacity of the Member Countries to plan and conduct similar studies in the future including the use of the assessment methodology primarily by working closely with the MRC Study Team throughout the process following the “learning by doing” principle.

Thematic Scope

With these three objectives, the study covers the important development sectors (hereinafter referred to as thematic areas) that contribute to the development in basin such as the following:

- Irrigation; including water use, return flows, water quality, and proposed diversions;
- Agriculture and Land use Change; including watershed management, deforestation, livestock and aquaculture, fisheries, and surface land mining;
- Domestic and Industrial use; including sediment extraction, waste water disposal, urban development, and water quality;
- Flood protection structures and floodplain infrastructure including roads on major floodplains;
- Hydropower, including potential of alternative energy options;
- Navigation, including infrastructure to aid navigation

Impact Areas

The positive and negative impacts of water resources developments under the six thematic areas cover the following physical and biological (environmental) aspects;

- Fisheries and fish production including impacts of over-fishing and illegal fishing;
 - Environmental condition/health
 - Biodiversity
 - Hydrology/water quantity which include ground water;
 - Water availability (drought);
 - Flood;
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- Food production;
- Sediment transport including river bank stability, sand mining, delta sediment plume; and
- Water quality including salinity intrusion.

and the following social and economic aspects:

- Food Security including impacts on food safety to the extent practicable;
- Quality of life based on either existing indices of United Nations (UN) organisations, or new indices developed specifically for the MRB;
- Flood risk;
- Drought risk;
- Human health, focusing on standard parameters used to assess health and Millennium Development Goals such as water borne disease;
- Social development including changes in cultural and traditional aspects of life. Impacts of demographic change will also be considered.
- Economic development;
- Employment with a focus on income generation; and
- Distribution of economic benefits.

Geographic Scope

The geographic scope of the thematic areas (i.e., developments causing impacts) is the entire Mekong River Basin (including developments in the Upper Mekong-Lancang). However, with respect to impacts, the focus is on the following geographic areas:

- A corridor on both sides of the mainstream from Chinese border to Kratie (Cambodia)
- The Cambodia Floodplains including the Tonle Sap River and Great Lake
- The Mekong Delta in Cambodia and Viet Nam
- The coastal areas directly influenced by the Mekong estuary

The Mekong mainstream corridor is chosen based on the fact that along the mainstream, the cumulative impact of development and management in the basin is being directly felt, whereas in the tributaries the impact is mainly due to the activities in the specific tributary. An initial proposal of a 15 km corridor on both sides of the mainstream is based on the extent of direct impact on livelihoods dependent on the mainstream (as defined by the MRC Social Impact Monitoring and Vulnerability Assessment, or SIM/VA, of the Environment Programme).

Tonle Sap River and Great Lake and other floodplains in Cambodia is an important area as it forms a unique hydro-ecological system with a unique fishery within the Mekong River Basin which is directly impacted by changes in the flow of the Mekong mainstream with respect to the flood pulse, sediment replenishment, flood extent, etc.

The Mekong Delta in Cambodia and Viet Nam are proposed because being at the end of the river's course it will be affected by the cumulative impact of infrastructure and water use. The central importance of the delta in agriculture and fisheries/aquaculture productivity makes it important to assess potential impact, but also competing uses of water from high population and many urban centres needs to be considered.

The coastal areas in this context are to be delimited to the areas directly affected by changes in the Mekong River's discharge into the sea together with the significance of coastal fisheries

and coastal processes (affecting issues such as coastal erosion and impacts of sea-level rise) makes this an important area to study.

Impact of Climate Change

Climate change is an important factor in the Study and will be assessed in terms of how it may exacerbate (increase) or mitigate (reduce) some of the impacts caused by changes in water use. In essence, the Study will identify the risks and opportunities that climate change provides in the context of basin development.

Added Value of Council Study over Previous Studies

The Council Study builds on the information and knowledge generated, and assessments conducted under similar studies such as MRC BDP2, SEA, and IBFM. In addition, the Council Study does not involve collection of new data and instead it completely relies on data already collected by MRC and various line agencies of the four Member Countries. While previous studies have improved the understanding of how different water uses impact the people, economy, and the biophysical environment in the LMB, the Council Study will close the remaining important knowledge gaps, and provide

- Increase in the resolution and thematic scope of the assessments as opposed to broad-based approach adopted in previous studies
- Detailed account of impacts on the river ecosystem and the value of ecosystem services to society
- Risks and opportunities that climate change provides in the context of developments in the 6 thematic areas
- Thematic-focused assessments in addition to cumulative assessments to tease out incremental impacts and better inform the identification of development and management measures that will enhance positive impacts, and minimize negative impacts
- Development of a comprehensive basins-wide assessment framework to improve certainty in the prediction of impacts
- Assessment of early water resources developments and impacts of exogenous developments (i.e., developments outside of the water sector) in order to provide a full picture of developments and associated impacts in the LMB

APPROACH

Assessment Framework

Understanding both the positive and negative impacts of the range of water resources developments in the LMB requires the development of an assessment framework that can be used to quantify the environmental, social, and economic impacts of specific developments in the LMB relating to irrigation, agriculture and land use change, domestic and industrial water use, flood protection and floodplain infrastructure, hydropower, and navigation.

Figure 1 illustrates conceptually the assessment framework developed for the Council Study. The assessment framework is composed of the following components:

Input: Development Scenarios and Climate Change Scenarios

Assessment Engine: Models, Methods, and Tools for hydrologic, biophysical, social, and economic assessments

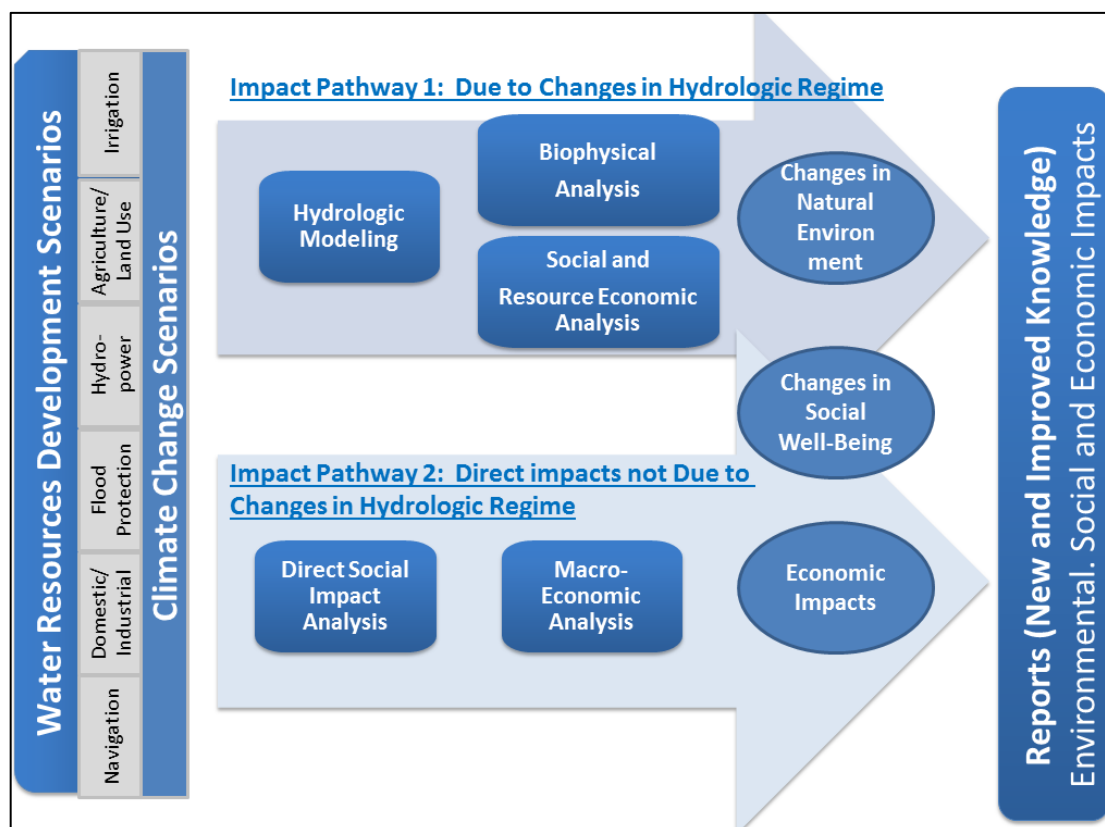
Output: Reports that embody new and improved knowledge and understanding of the positive and negative impacts of water resources developments

The development and implementation of the assessment framework for the Council Study involved the following major activities:

- Activity 1: Formulation of development scenarios and climate change scenarios
- Activity 2: Development, setup and calibration of models, methods, and tools
- Activity 3: Assessment of development and climate change scenarios using the models, methods, and tools
- Activity 4: Preparation of Reports to document resulting new and improved knowledge and understanding of the positive and negative impacts of water resources developments

It should be noted that under Activity 3, two general types of impacts are assessed namely:

1. Impact Pathway 1: Positive and negative impacts due to changes in hydrology. To illustrate, a dam or an irrigation project changes the timing, quantity, quality and/or content of the water which changes the biota which in turn has a socio-economic impact. Impacts of this type is possible downstream of the development (i.e., transboundary impacts).
 2. Impact Pathway 2: Positive and negative impacts not transmitted via the hydrological regime. These include the primary and secondary economic costs and benefits of the selected water resources developments and infrastructure as well as other social benefits including access to services, employment opportunities, social displacement, migration, and gender impacts.
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Process

The Council Study, as it is designed, is a study that is co-led by the MRC Secretariat and Member Countries. The process adopted is open, transparent, and highly consultative with Member Countries consulted and involved in decision-making throughout the process. This consultative process is strengthened through the formation of the Regional Technical Working Group (RTWG) for the Council Study which provides technical oversight to the Council Study Team as per its TOR.

During the early implementation phase of the Council Study several regional and national consultation meetings on various topics have been conducted and they include the following:

- Four RTWG Meetings (3rd, 4th, 5th and 6th RTWG Meetings)
- Several Regional Technical Workshops on Formulation of Development Scenarios (Irrigation, Agriculture/Land Use Change, Domestic and Industrial Water Use, Hydropower, Navigation)
- National Consultations on Formulation of Development Scenarios (Irrigation, Agriculture/Land Use Change, Flood Protection/Floodplain Infrastructure)
- Discipline-specific regional technical workgroup meetings (Modelling Approach, Baseline Selection, Reference Scenario/Period, WUP-FIN modelling, BioRA Knowledge Capture Workshops, preparatory technical meetings for the Delta Field Visit, and social and economic assessment mini-workshop)
- National consultations initiated, planned and organized by Member Countries

PROGRESS AND INTERIM RESULTS

Since the Inception Report (dated 27 October 2014) was agreed by the Member Countries to be used as a basis for implementation, substantial progress was achieved. Early progress in 2014 included a start-up workshop and 3rd RTWG Meeting in November 2014 which represented the beginning of the implementation of the Council Study, completion of detailed implementation work plans and staffing plans of the thematic and discipline teams, establishment of the Council Study Team within the Secretariat, successful recruitment of key international and riparian consultants, and establishment and implementation of communication and coordination mechanisms such as the monthly Coordination Group Meeting, and the CS Web Site/Team Site. In addition to the MRCS personnel and representatives from the Member Countries, the Council Study team includes 25 international/regional consultants and 54 national consultants spread across 6 thematic teams and 4 discipline teams.

This year 2015, in about one year of implementation, substantial technical progress has been achieved and these include the following milestones:

- Completed Detailed Modelling Approach for the Council Study which features the use of DSF and supplemented by other models such as WUP-FIN and eWater Source. The approach was developed in consultation with MCs through TACT, RTWG, and small group technical meeting. The Modelling Team is setting up and calibrating the models based on this modelling approach.
 - MCs agreed to assess three main development scenarios (2007, 2020, and 2040) that will be used primarily as the basis for the cumulative impact assessment and documented in the cumulative assessment report. The thematic teams are collecting and assembling data and filling data gaps for these development scenarios in close consultation with the MCs
 - MCs agreed in the formulation and use of thematic sub-scenarios which will be used as the basis for thematic impact assessments and documented in the six thematic assessment reports. Up to three sub-scenarios for each thematic area will be identified as soon as the 2040 main development scenario is successfully formulated.
 - MCs agreed to use the 2007 main development scenario as the reference scenario, the scenario to which comparisons and determination of impacts will be made. In conjunction with this selection, MCs agreed to also analyse for flow, sediment, and water quality for the following two additional development scenarios: Year 1960 (representing natural conditions), and Year 2000.
 - MCs agreed to use reference period from 1985 – 2008 to serve as the common hydrologic sequence that will be used for the simulation of all development scenarios. As an additional analysis, the 1960 development scenario will be modelled from 1960 to 1985.
 - MCs agreed on three proposed climate change scenarios for the Council Study. These scenarios are three of the nine basin-wide climate change scenarios recommended for LMB under the CCAI MASAP.
 - As part of developing a new ecosystem model for the LMB (i.e., DRIFT-DSS for LMB) which is designed to work in conjunction with DSF and the other Council Study models, a draft list of indicators and linked indicators for various disciplines (geomorphology, vegetation, fish, macroinvertebrate, herpetofauna, birds, and mammals) have been developed. Initial set of response curves have been developed for these linked indicators for four focus areas in mainstream Mekong and Tonle Sap. Two technical progress reports (including specialist field notes during the Delta Field Visits) were prepared and reviewed by the Member Countries.
 - Completed draft detailed methodology for the social and economic assessments for the Council Study. The detailed methodology and associated report will be submitted for Member Countries review.
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Interim Reports

The Council Study Team has also recently completed several technical documents and presentations which will ultimately be incorporated in the final report deliverables of the Council Study. These include interim reports that are listed below and are included as attachments to this executive summary.

- Executive Summary: Council Study Interim Reports
- Modeling Interim Report
 - ISIS Baseline Model for Mekong River in Upper Kratie
 - Improvements of the ISIS LMB Baseline Scenario Model
 - SWAT Model for Sediment and Nutrient Simulation in the Mekong River Basin
 - The Sediment and Nutrient Data Available and Analysis for the DSF model Simulation in the Lower Mekong Basin
 - eWater Source Model (Baseline 2007): Application in the Upper Mekong River Basin
- Bioresource Assessment Interim Report (Three Volumes)
 - Volume 1: Specialists' Report
 - Volume 2: Guide to Viewing and Updating the BioRA DSS
 - Volume 3: Preliminary Calibration Report
- Social Assessment Methodology Report
- Economic Assessment Methodology Report
- Interim Thematic Report – Agriculture/Land Use Change
- Interim Thematic Report – Hydropower
- Interim Thematic Report – Irrigation
- Interim Thematic Report – Flood Protection
- Interim Thematic Report – Navigation
- Working Paper on Development Scenarios – Agriculture/Land Use Change
- Working Paper on Development Scenarios – Hydropower
- Working Paper on Development Scenarios – Irrigation
- Working Paper on Development Scenarios – Flood Protection
- Working Paper on Development Scenarios - Navigation

In addition, the following technical presentations during the 6th RTWG Meeting are provided in lieu of the technical reports. The technical reports equivalent to these presentations are still in preparation:

- Climate Change Scenarios for the Council Study
 - Working Paper on Development Scenarios – Domestic and Industrial Water Use
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FINANCIAL REPORT

Budget and Spending

The table below shows the budget summary of the Council Study. The secured funding is about USD 3.7M. A funding gap of USD 2.5 M remains. This funding gap is intended to cover the Council Study activities in Phase 2 (i.e., 2016) and successfully complete the Study.

Budget Item	Amount USD
Total Budget Required	7.1M
External Funding Required	6.2M
Secured Funding (Australia, Finland, Germany, Luxembourg, SDC, USA)	3.7M
External Funding Gap	2.5M

The current secured funding of USD 3.7 M will cover the Council Study activities in 2015 and up to March 2016 (Phase 1). The table below shows the breakdown of this secured funding by Development Partner contribution. Note that about USD 0.85M is managed directly by the Programmes.

Funding Source	Amount	Project Name
Trust Fund	2,874,220	
Finland (End: 31 Dec 2015)	650,400	Water Management Trust Fund
Australia (End: 1 Apr 2016)	463,820	Council Study Trust Fund
Germany (End: 31 Mar 2016)	260,000	
Luxembourg (End: 31 Dec 2015)	500,000	
SDC (End: 30 Jun 2017)	500,000	
USA (End: 30 Sep 2016)	500,000	
Programme Managed	857,349	
Luxembourg (Repurposed) (End: 31 Dec 2015)	500,000	Managed by CCAI
ISH (End: 31 Dec 2015)	165,000	Managed by ISH
Finland (Accrued Interest) (End: Indefinite)	192,349	Managed by IKMP
Total Trust Fund and Programme Managed	3,731,569	

The table below shows the budget allocation by cost category of the secured funding and in comparison with the original estimated budget allocation of the 6.2M estimated budget from external funding.

Cost Category	Estimated Total Budget	Budget Allocated from Secured Funding (USD)	Percent of Total Allocated Budget
Coordination and Management*	885,000	774,351	87.5
International/Regional Consultants	1,867,123	1,013,288	54.3
National Consultants	879,000	729,626	83.0
Travel	403,500	135,200	33.5
Meeting Costs	859,667	518,506	60.3
Operational Costs	231,625	183,142	79.1
Payment of Coastal Assessment	250,000	0	0.0%
Sub-Total	5,375,915	3,354,113	
Contingency 5%	268,796		
MAF 11%	591,351	377,455	
Total	6,236,061	3,731,569	59.8
*includes <u>BioRA</u> technical coordination, current and former CS Council Study Coordinator, and administrative assistant			

The table below shows the spent to date, estimated planned spending by end of 2015, and the estimated budget available to remain to cover CS coordination/management and activities in January – March of 2016 to complete Phase 1.

Project	Budget (USD)	Invoiced and Paid as of Oct 2015 (USD)	Estimated Additional Total Spending in 2015 (USD)	Estimated Budget Available for 2016 (USD)
Trust Fund	2,874,220	1,225,981	1,067,333	580,906
Programme-Managed	857,349	548,470	155,000	153,879

Adjustment/Reduction in Council Study Scope for Phase 2 Due to Budget Constraints

With only USD a fraction of the USD 2.5M funding gap is expected to be made available in 2016 from the basket funding, the Council Study Team is faced with the following options:

- Significantly reduce scope of work
- Adopt an abbreviated consultative process (less number of regional/national meetings and smaller but more effective). Note that the Member Countries have already expressed their disagreements in this option.
- Postpone some tasks to 2017 to take advantage of additional funding in 2017
- Smaller but effective Secretariat Team as proposed earlier
- Combine with other studies to cost-share common tasks
- Seek direct additional funding for the Council Study

Of all the above options, re-evaluating the scope of work to reduce scope, postpone tasks, and combine/coordinate task with the others studies will have to be conducted no matter what. It is proposed that a small team (members to be determined later) should conduct this analysis immediately (and propose to the Member Countries for approval) but only after a decision has been made on the new implementation arrangement.

PROPOSED WAY FORWARD

Revised Implementation Schedule

Due to funding constraints and the MRC transition to the new organizational structure, a revised implementation schedule which involved breaking the implementation of the Council Study into Phase 1 and Phase 2 (see Figure below) was presented during the 5th and 6th RTWG Meetings and the 42nd JC Meeting. All MCs during the 5th RTWG Meeting expressed agreement in principle to the proposed implementation schedule. However, during the subsequent 42nd JC Meeting, one of the JC Members have expressed to see the Council Study interim report deliverables first before agreeing on the proposed phasing of the implementation of the Council Study.

While this proposed Phase 1 and Phase 2 implementation schedule has not been officially agreed upon by all MCs, this schedule represents the most sensible path forward given the challenges and uncertainties that MRC in general, and the Council Study Team in particular are facing. This also addressed the long recognition by the MCs and Development Partners as expressed during the 4th and 5th RTWG Meetings, 41st and 42nd JC Meetings, and Informal Donor Meeting that an extension of the current implementation schedule of the Council Study is warranted to be more realistic. It should be noted that originally, a three-year implementation phase was proposed but because of delays in the planning phase, this has placed undue pressure to speed-up and shorten the implementation phase.

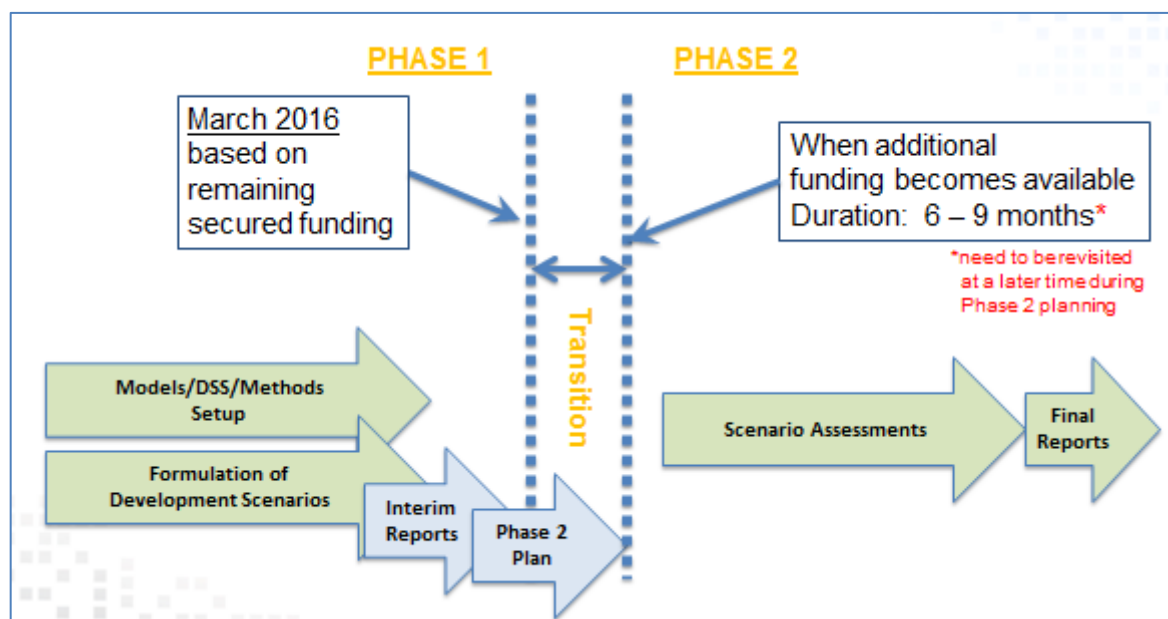
In the proposed phasing of the implementation schedule, Phase 1 is designed to complete ongoing activities on

- Setting up and developing the Council Study models, tools, and methodologies for scenario assessments; and
- Approval of formulated development scenarios.
- Completing final draft interim reports

Phase 2 is intended to

- Complete the scenario assessments; and
- Prepare the final report deliverables of the Council Study.

Phase 2 will be started when the funding gap or a substantial portion of the funding gap has been addressed. A transition phase will occur between Phase 1 and Phase 2 during which very little or no Council Study activities will occur. The duration of the transition phase depends on when substantial additional funding becomes available. The transition period will also be used to finalize a detailed implementation plan for Phase 2 including specifying the new implementation arrangement as the result of the new MRC structure. If full funding is available, Phase 2 is expected to take 6 – 9 months but will be revisited during the detailed planning for Phase 2.



Revised Implementation Arrangement

The MRC new organizational structure presents opportunities to significantly improve the implementation. With the Programmes not existing anymore in the new MRC structure, a new implementation arrangement for the Council Study is warranted. This new implementation arrangement also presents opportunities to improve cost efficiencies. The following are proposed for the new implementation arrangement target to be implemented for Phase 2 (see Figure below):

1. Council Study Coordination

The current Council Study Coordinator is serving the dual roles of both the Council Study Coordinator (i.e., Project Manager) and Technical Coordinator. It is proposed to correct this by splitting this role into two positions as originally planned in the Inception Report.

- A full-time Council Study Coordinator perhaps selected from the current staff or recruited (as a consultant) from the region should be strongly considered. The Council Study Coordinator will focus on the day-to-day coordination and management aspects that include scope management, tracking schedules, controlling and tracking expenditures, overall management of consultants (including review/approval of timesheets and outputs) coordination and communication with MCs, reporting to CEO and senior staff, planning and implementation (including facilitation, note taking, post-meeting follow-up) or regional and national meetings and consultations (including stakeholder consultations), communication and reporting to DPs, assistance to fund raising activities, and provision of other MRC administrative matters. When possible, all consultants should report directly to the Council Study Coordinator or to the immediate supervisor of the Council Study Coordinator.
- A part-time (SSA-consultant) Council Study Technical Adviser/Coordinator. The role of the technical adviser is to work closely with the Council Study Coordinator to assist in coordinating, reviewing and consolidating technical inputs and reports of the different thematic and discipline teams and consultants and lead the preparation of the main report deliverable. The technical adviser will assist in providing overall

technical oversight according to the technical scope and participate in technical presentations and discussions during regional and national technical meetings and consultations. On as needed, the technical adviser will participate in technical discussions during work meetings by the thematic and discipline teams.

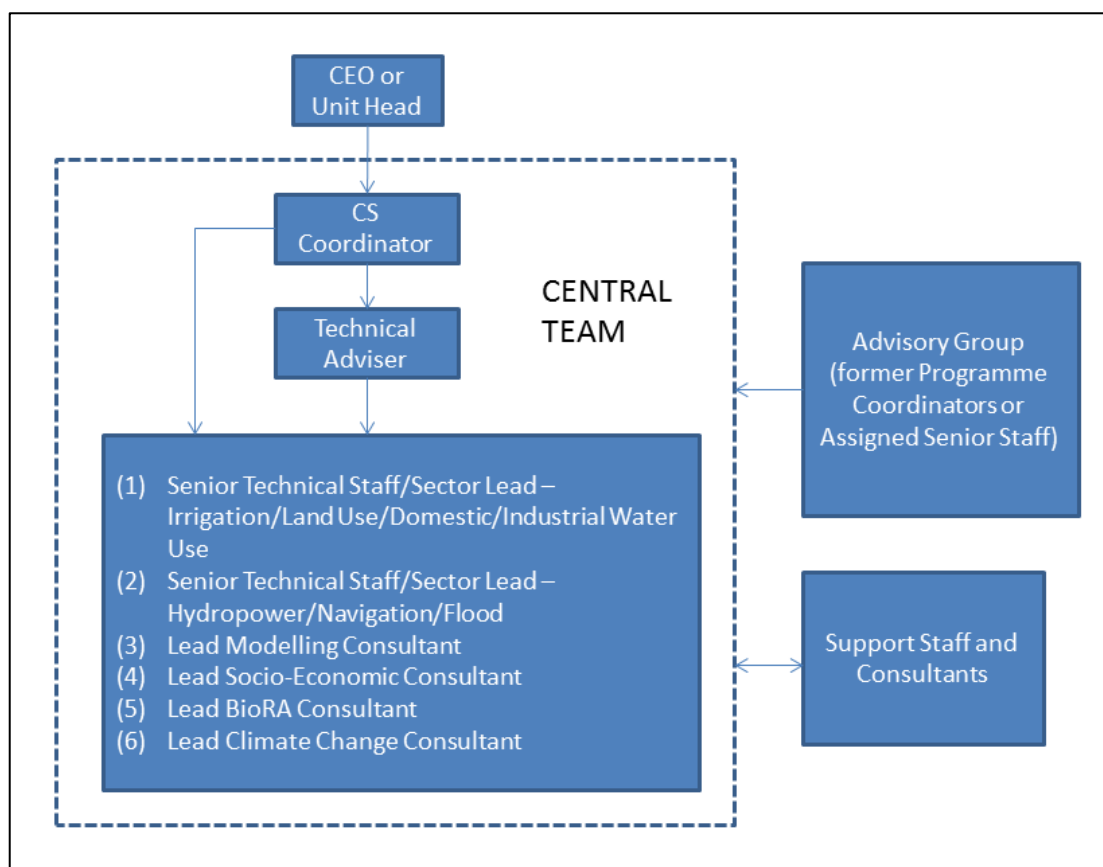
In addition to the two abovementioned positions, two senior technical staff (proposed to be full time) and an administrative assistant should report directly to the Council Study Coordinator. The senior technical staff will work closely with the Technical Adviser and will help manage the consultants and consolidate technical inputs in particular of the thematic areas as described in the next section below. The Administrative Assistant will work directly with the Council Study Coordinator. These positions will be part of the Central Team of the Council Study.

2. Smaller and Leaner Management and Technical Team

When possible, the thematic teams and the discipline teams have to be consolidated or reduced in size. The current management approach (with each team managed by a Programme Coordinator) is proposed to be eliminated with the Programme Coordinators serving on an advisory role as appropriate. As noted earlier, all consultants will be reporting directly when possible to the Council Study Coordinator, the immediate supervisor of the Council Study Coordinator, or senior technical staff who are members of the Central Team. The following are proposed for considerations:

- Consolidate the water use thematic teams: Irrigation, Agriculture/Land Use Change, and Domestic/Industrial Water Use Team. This will be managed by one of the senior technical staff of the Central Team.
 - Consolidate the other thematic teams: Hydropower, Navigation, and Flood Protection. This allows taking advantage of synergies in infrastructure options for multi-purpose hydropower dams that take account of navigation and flood protection investment opportunities. This will be managed by one of the senior technical staff of the Central Team.
 - Consolidate the hydrologic assessment team around the modeling team. The Modelling Team will be directly under the supervision of the Council Study Coordinator. A lead modeling consultant for the Council Study will be identified to work directly with the Council Study Coordinator and Technical Adviser and coordinate efforts within the modeling team. It should be noted that the modeling team will likely remain relatively large because of support needed by the other MRC projects. Therefore, better coordination of the modeling requirements of the all MRC projects should be pursued.
 - During most of Phase 2 (after the final KCW), the BioRA Team will become much smaller after the DSS has been completely developed. Dr. Cate (BioRA Team Lead) who is the technical lead of the BioRA Team will be part of the Central Team and will work directly with the CS Coordinator and Technical Adviser. Basically, there will not be a Bioresource Assessment Team anymore.
 - A lead consultant will be identified for the socio-economic/macro-economic assessment and will be assisted by 1-2 consultants as needed or by in-house technical staff. The lead consultant will be also part of the Central Team. There will not be a socio-economic/macro-economic assessment team anymore.
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- A consultant will be identified for the climate change assessment. The climate change scenarios have been selected and subsequent technical work will be primarily done by the modeling team. The lead consultant will be responsible for analyzing the modeling results within the context of climate change and prepare the technical report. Coordination of the Council Study with MASAP will be done by the Council Study Coordinator with the assistance of the Technical Adviser and the CC consultant.
- There will be no Cumulative Assessment Team anymore. The analysis of the modeling results and the preparation of the cumulative assessment report will be conducted primarily by the Central Team with the Council Study Coordinator with the assistance of the Technical Adviser leading the task.



Proposed revised implementation arrangement for Phase 2.