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

IWRM-based Basin Development Strategy 2016-2020

National Indicative Plan 2016-2020

Promotional Report on Identified Joint Projects in the Lower Mekong Basin 2016-2020

Prepared by the Mekong River Commission Secretariat

April 2017

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Abbreviations and acronyms

ADB	Asian Development Bank
BDS	Basin Development Strategy
CRA	Cooperative Regional Assessments
GMS	Greater Mekong Subregion
IWRM	Integrated Water Resources Management
IFI	International Financial Institution
JC	Joint Committee (of the MRC)
LMB	Lower Mekong Basin
MAFF	Ministry of Agriculture, Forestry and Fisheries (of Cambodia)
MARD	Ministry of Agriculture and Rural Development (of Viet Nam)
MEM	Ministry of Energy and Mines (of Lao PDR)
MLMUP	Ministry of Land Management, Urban Planning and Construction (of Cambodia)
MME	Ministry of Mines and Energy (of Cambodia)
MOE	Ministry of Environment (Cambodia)
MOFA	Ministry of Forestry and Agriculture (of Lao PDR)
MOIT	Ministry of Industry and Trade (of Viet Nam)
MONRE	Ministry of Natural Resources and Environment (of Thailand)
MONRE	Ministry of Natural Resources and Environment (of Lao PDR)
MONRE	Ministry of Natural Resources and Environment (of Viet Nam)
MOWRAM	Ministry of Water Resources and Meteorology (of Cambodia)
M&E	Monitoring and evaluation
MoU	Memorandum of Understanding
MPWT	Ministry of Public Works and Transport (of Cambodia)
MRC	Mekong River Commission
MRD	Ministry of Rural Development (of Cambodia)
MRCS	Mekong River Commission Secretariat
MRC SP	MRC Strategic Plan
NIP	National Indicative Plan
NMC	National Mekong Committee
NMCS	National Mekong Committee Secretariat
PIU	Project Implementation Unit
PNPCA	Procedures for Notification, Prior Consultation and Agreement
RBO	River Basin Organization
SDG	Sustainable Development Goal
TOR	Terms of Reference
TSA	Tonle Sap Authority
WB	World Bank

Executive Summary

The assessment of the cumulative impacts of the existing national water resources development plans of the Mekong Basin countries demonstrates that the national plans are sub-optimal from a basin-wide perspective. The national plans do not address long-term water security and environmental needs, and miss opportunities to increase regional benefits and reduce costs.

Joint projects by two or more countries are the principal means to address these shortcomings of the national plans. Such projects come in various forms but are always founded on a win-win outcome for the participating countries. Most joint projects lead to a joint or coordinated investment, underpinned by an appropriate legal framework. They lead inevitably also to higher levels of transboundary cooperation and regional integration.

So far, few joint projects have been realized in the Mekong region through direct cooperation between countries. Some examples can be found in the navigation and energy sectors. Much more needs be done to provide a comprehensive response to climate change, reduce flood and drought risks, protect environmental assets, and increase basin-wide benefits. Achieving these goals is essential and urgent as populations and economies grow and climate change advances.

In line with its mandate, the MRC has prioritized the pursue of joint projects through its refreshed strategic planning cycle. In response to the updated IWRM-based Basin Development Strategy for 2016-2020, the Lower Mekong Basin (LMB) countries have prioritized the following five joint projects:

Implementing country	**Joint projects**	**Principal sectors**
Lao PDR and Thailand	Lao-Thai safety regulations for navigation	Navigation
Cambodia and Lao PDR	Cross border water resources development and management, including environmental impact monitoring of Don Sahong hydropower project	Hydropower Environment
Cambodia and Thailand	Transboundary cooperation for flood and drought management in Thai-Cambodian border area – a part of 9C-9T Sub-area	Flood/drought management
Cambodia, Lao PDR, and Viet Nam	Sustainable water resources development and management in the Sekong, Sesan and Srepok river basins (3S Basin)	Hydropower Environment Flood/drought
Cambodia and Viet Nam	Integrated flood management in the border area of Cambodia and Viet Nam in the Mekong Delta for water security and sustainable development	Flood protection Agriculture

A summary description of each joint project is provided in Chapter 3. Full project information notes are attached in Annex 1-5. The identification of the joint projects has benefitted from transboundary dialogues and joint issues papers prepared under the World Bank supported Mekong IWRM Programme. All joint projects address transboundary issues and support Government commitment for the achievement of the Sustainable Development Goals at country, regional and global levels. All joint projects are prioritized in national planning frameworks.

All joint projects involve a planning component and one or more implementation components. The planning component will be based on IWRM principles and address uncertainties, such as climate change. Depending on the project, this may include the development of joint rules (Lao-Thai navigation), the development of a joint action plan with structural and non-structural projects (most joint projects), or the preparation of early "no regret" projects, such as the preparation of the extension of monitoring and forecasting systems (some projects) and the improvement of border canals in the Mekong Delta.

The implementation of the structural and non-structural projects, such as floodway, canal improvements, reforestation, hydro-meteorological networks, forecasting and early warning systems, changes in the socio-economic and spatial plans, can in many cases be implemented at the national level by the responsible national agencies and with transboundary coordination. However, there will be also projects that require joint implementation and management.

Currently, the MRC is setting up the implementation arrangements for the joint projects in consultation with the responsible national implementing agencies and provinces. The required transboundary coordination will build on existing mechanisms. In some cases, a transboundary steering committee will be established. It is anticipated that service providers, such as consulting firms, and international organizations will support the implementation of the planning component.

The duration of the planning component of the joint projects varies between 2 and 3.5 years. The estimated costs of the planning component of the joint projects is given in the table below. The cost for further project preparation and implementation of the structural and non-structural projects will be determined during the implementation of the planning component.

Implementing country	Title of joint projects	Estimated costs (US$)
Lao PDR and Thailand	Lao-Thai safety regulations for navigation	1,000,000
Cambodia and Lao PDR	Cross border water resources development and management, including environmental impact monitoring of Don Sahong hydropower project	1,500,000 100,000/year (impact monitoring)
Cambodia and Thailand	Transboundary cooperation for flood and drought management in Thai-Cambodian border area – a part of 9C-9T Sub-area	1,200,000

Cambodia, Lao PDR, Viet Nam	Sustainable water resources development and management in the Sekong, Sesan and Srepok river basins (3S Basin)	2,610,000
Cambodia and Viet Nam	Integrated flood management in the border area of Cambodia and Viet Nam in the Mekong Delta for water security and sustainable development	2,730,000 2,000,000 (border canals, floodways)

Funding for the implementation of the planning component is sought from development partners with experience in the implementation of such projects. The subsequent implementation of the structural and non-structural projects will be funded from the national budget. Development partners that are interested in supporting one or more joint projects are kindly requested to contact the MRC Secretariat:

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1 Introduction

Early 2016, the MRC Council endorsed an updated IWRM-based Basin Development Strategy for the Lower Mekong Basin (LMB) for 2016-2020 (BDS 2016-2020). The Strategy provides regional and transboundary perspectives for the management of the Mekong Basin, as well as development opportunities and strategic priorities for basin development and management.

The MRC implements the BDS 2016-2020 at the regional level through the MRC Strategic Plan 2016-2020 (MRC SP) and at the national level through the updated National Indicative Plans 2016-2020 (NIPs). Together the MRC SP and the NIPs will implement MRC's response to the BDS. The implementation activities in the MRC SP and NIPs are being monitored through a common M&E and reporting system.

All above-referenced documents stress the importance of joint projects for a long-term, sustainable and peaceful basin development in the Mekong Basin. Subsequently in 2015/2016, the LMB countries have prioritized five joint projects for implementation with support from development partners.

The purpose of this report is to describe the five prioritized joint projects. The report will be used to promote the joint projects for funding and implementation support among development partners with experience with such projects.

This report first summarizes the role and characteristics of joint projects, and how they are identified (Chapter 2). In Chapter 3, summary descriptions are given of the five prioritized projects. Detailed joint project information notes (JPINs) are provided in Annex 1-5. Chapter 4 compares the joint projects in terms of their implementation and funding requirements. The next steps are provided in Chapter 5.

2 Role and characteristics of joint projects

Role of joint projects

The assessment of the cumulative impacts and risks of the existing national water resources development plans of the Mekong Basin countries demonstrates that the national plans are sub-optimal from a basin-wide perspective. The national plans do not address long-term water security and environmental needs, and miss opportunities to increase regional benefits and reduce costs.

Experience from other regions indicates that joint management and development will be needed, along with cost and benefit sharing deals, to move national plans towards optimal and sustainable development in the Mekong Basin. Achieving these goals is essential and urgent as populations and economies grow and climate change advances, putting more people and assets in harm's way.

Consequently, joint projects are the principal means to further improve the national water resources development plans to: (i) ensure long-term water and environmental security and (ii) achieve optimal and sustainable development, as envisioned in the 1995 Mekong Agreement. The development of joint projects would also increase transboundary cooperation and regional integration.

Characteristics of joint projects

Joint projects involve two or more countries and address issues and opportunities that one country alone could not do as effectively. MRC's report and brochure on regional benefit sharing in the Mekong Basin (December 2015) provides case studies and examples of joint projects from the Mekong region and other parts of the world.

These case studies and examples show that joint projects come in various forms to suit riparian countries, but are always founded on a win-win outcome for the participating countries. All joint projects lead to a joint or coordinated investment, underpinned by a legal framework appropriate to the circumstances, and having a degree of flexibility to cope when those circumstances change. Specific characteristics are:

- Joint investments (sharing costs and benefits) in infrastructure and facilities (for multiple purposes from flood protection and navigation to energy and irrigation) are often central to achieving a win-win outcome. Such investments are often preceded by lengthy joint planning and project preparation. A specific treaty or agreement is made up by the participating countries to ensure mutual benefits from the project;

- Some joint projects lead to coordinated national actions and investments of a non-structure nature in the respective countries to achieve a mutually beneficial outcome (under a MoU, agreement or treaty as appropriate), such as navigation aids, monitoring and flood warning systems, and floodplain and watershed management. Also, non-structural investments are preceded by substantial joint preparatory work, such as the development of common rules for navigation, the planning of preservation of natural floodplains, and the

development of common standards for the monitoring of water and related resources; and

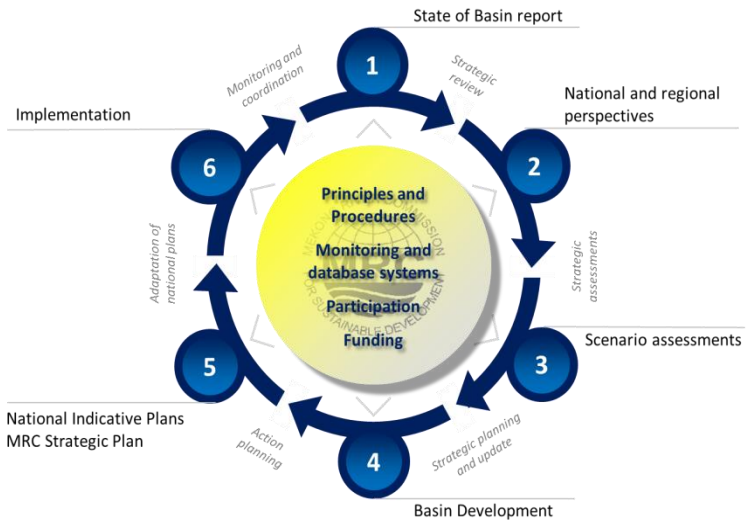
- Most joint projects contribute to increasing regional benefits, reducing regional costs, minimizing adverse impacts, and providing water-related security. The development of joint projects leads inevitably also to higher levels of transboundary cooperation, benefiting many sectors, such as food, energy, navigation, tourism, and flood protection (and thus would advance ASEAN integration).

Identification of joint projects in the Mekong region

So far, few joint (investment) projects have been realized in the Mekong region through direct cooperation between countries. Some examples can be found in the navigation sector (Quadripartite Agreement on Navigation on the Lancang-Mekong and the Agreement on Waterway Transport between Cambodia and Viet Nam) and in the energy sector where investments are made by organizations from Thailand and Viet Nam in projects situated in the Lao PDR.

MRC supports the identification of new joint projects in each of the six steps of its refreshed strategic planning cycle (Figure 1). Through state of the basin monitoring and reporting the key issues and opportunities are established that need to be addressed in the next steps of the planning cycle.

Figure 1: MRC strategic planning cycle



These issues and opportunities are further explored in basin-wide scenario assessments that include joint projects. The assessment results, in terms of regional distribution of benefits, costs, impacts and risks, are compared with those of the currently planned development in the LMB countries.

Basin-wide discussions of the scenario assessment results among a wide range of stakeholders shape the updating of the Basin Development Strategy for the next five years. The Strategy provides the development opportunities and the actions for coordinated and joint investments.

The Basin Development Strategy is implemented at the regional level through the MRC SP and at the national level through the updated NIPs. The NIPs are the primary channel by which basin perspectives, development opportunities, strategic priorities are mainstreamed into national strategies, plans, policies and systems. The NIP supplements the national plans with joint projects and national

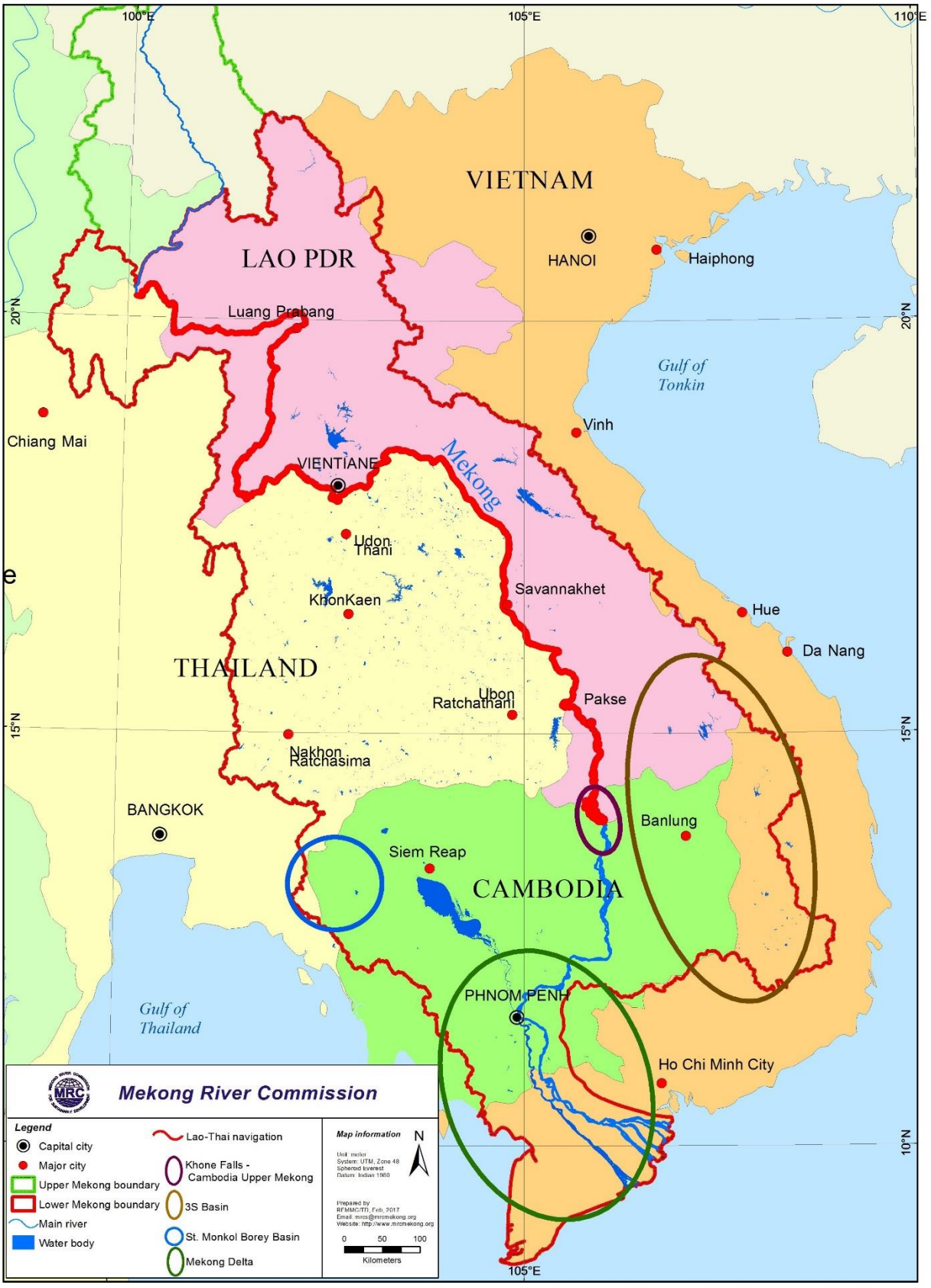
projects and activities that are of basin-wide significance and could increase regional benefits, reduce regional costs, and increase water-related security.

The implementation of the projects and activities in the MRC SP and NIPs are being monitored through a common M&E and reporting system that is able to track MRC implementation progress and provide output and outcome information to MRC's governance bodies and stakeholders. This system is coordinated by MRCS.

It is noted that the above planning process does not indicate approval of a joint project. For project approval, an opportunity needs to pass through national planning, preparation and approval processes, and as appropriate through the MRC Procedures (such as PNPCA) with other countries under the MRC cooperation.

Addressing cross-cutting issues. Throughout the identification process, cross cutting issues are being considered, such as economic growth, poverty alleviation, food security, gender equality, climate change and its impacts, institutional development and capacity building, environmental protection and restoration, and disaster risk reduction. These and other issues all figure prominently in the UN Sustainable Development Goals. As a result, most of the identified joint projects address multiple SDGs (see Chapter 3).

Figure 2: Overview of the Five Joint Projects in the Lower Mekong Basin



3 The identified joint projects

General

The identified five joint projects are listed in Table 1 below together with the implementing countries and the principal sectors that are addressed. Their locations are provided in Figure 2.

Table 1: Proposed joint projects

Implementing country	Title of joint projects	Principal sector
Lao PDR and Thailand	Lao-Thai safety regulations for navigation	Navigation
Cambodia and Lao PDR	Cross border water resources development and management, including environmental impact monitoring of Don Sahong hydropower project	Hydropower Environment
Cambodia and Thailand	Transboundary cooperation for flood and drought management in Thai-Cambodian border area – a part of 9C-9T Sub-area	Flood and drought management
Cambodia, Lao PDR, Viet Nam	Sustainable water resources development and management in the Sekong, Sesan and Srepok river basins (3S Basin)	Hydropower Environment Flood/drought
Cambodia and Viet Nam	Integrated flood management in the border area of Cambodia and Viet Nam in the Mekong Delta for water security and sustainable development	Flood protection Agriculture

All five joint projects could lead to joint or coordinated national investments in infrastructure, equipment or facilities, which would create additional regional benefits and improve water and environmental security. Most projects require substantial planning and investment preparation for which funding and expertise is sought from development partners. Due to its central situation in the LMB, Cambodia is an implementing country in four of the five joint projects.

Relationship with transboundary projects of MIWRMP. The identification of the joint projects has benefitted from transboundary dialogues and joint issues papers (September 2016) prepared under the World Bank supported Mekong IWRM Programme for the following transboundary projects:

- **Mekong-Sekong Fisheries Management (Lao PDR-Cambodia),** which focuses on unsustainable fishing practices and differing fisheries laws and management, and aims at improvement of fisheries management through dialogue. The results are used for the identification of the joint project "Cross border water resources development and management, including

environmental impact monitoring of Don Sahong hydropower project" and the joint project "Sustainable water resources development and management in the Sekong, Sesan and Srepok river basins (3S Basin)";

- **Sesan and Srepok River Basins (2S: Cambodia – Viet Nam),** which addresses hydropower development risks and opportunities, and aims at improvement of IWRM-based cooperation and dialogue. The results have been used for the identification of the joint project "Sustainable water resources development and management in the Sekong, Sesan and Srepok river basins"; and

- **Mekong Delta (Cambodia – Viet Nam),** which focuses on the impacts of floodplain development and climate change on floods and droughts, and aims at improvement of IWRM-based cooperation and dialogue. The results have been used for the joint project "Integrated flood management in the border area of Cambodia and Viet Nam in the Mekong Delta for water security and sustainable development".

In the following, each of the five joint projects is summarized. A detailed Project Information Note is provided in Annex 1 to 5.

Lao-Thai safety regulations for navigation (Thailand, Lao PDR)

The Master Plan for Regional Waterborne Transport in the Mekong River Basin (2015) provides a phased action and investment plan covering a wide range of structural and non-structural projects and activities. For the safety of navigation of the Mekong mainstream from Chiang Saen (Thailand) to Khone Falls (Lao PDR), it was suggested that Lao PDR and Thailand should work together towards the adoption of "common safety regulations for ports, vessels and navigation, as well as anti-pollution rules" in this stretch of the Mekong (see Figure 3).

Thailand and Lao PDR have agreed to initiate these priorities and related matters as a joint project under MRC's basin planning process. The joint rule making process will consider the results of similar activities under the Quadripartite Agreement between China, Myanmar, Thailand and Lao PDR in the Upper Mekong and the Navigation Agreement between Cambodia and Viet Nam in the Lower Mekong.

The first project component will establish the joint safety and anti-pollution rules, including inspection of vessels. This addresses a wide range of vessel safety and pollution prevention and risk reduction measures, including: navigation rules, vessel safety standards and working practices, the management of vessels, the carriage, handling and storage of dangerous goods, and emergency preparedness on board and emergency response management by vessel operators.

The second component will establish the joint rules for port safety and emergency response. In many ports, emergency response planning and equipment is very limited or non-existing. Both countries agree that all ports, especially passenger ports, should have a minimum of safety equipment. Taking into consideration the (forecasted) passenger throughput, ports should be able to efficiently deal with an emergency.

The third component will identify other priority actions of mutual interest which would increase navigation safety and emergency preparedness and response. This could include but not limited to: waterway improvement activities, aids to navigation activities, environmental activities, institutional development activities, and capacity building activities.

The fourth component will provide support to national implementation of the agreed joint rules and priority actions, amongst others through periodic exchange of progress and experiences between the two countries.

Figure 3: Location of the Mainstream Navigation Joint Project between Lao PDR and Thailand

Given the basin-wide nature of this joint project, it will be executed by the MRCS (in coordination with the NMCS in the two countries), and implemented by the Waterway Department of Lao PDR and the Marine Department of Thailand. Cooperating agencies include the local port authorities and vessel operators. In support of implementation, the MRCS will run one or more expert groups. The downstream countries (Cambodia and Viet Nam) will be engaged in the process, given their interest in regional trade and the improvement of navigation on the Mekong.

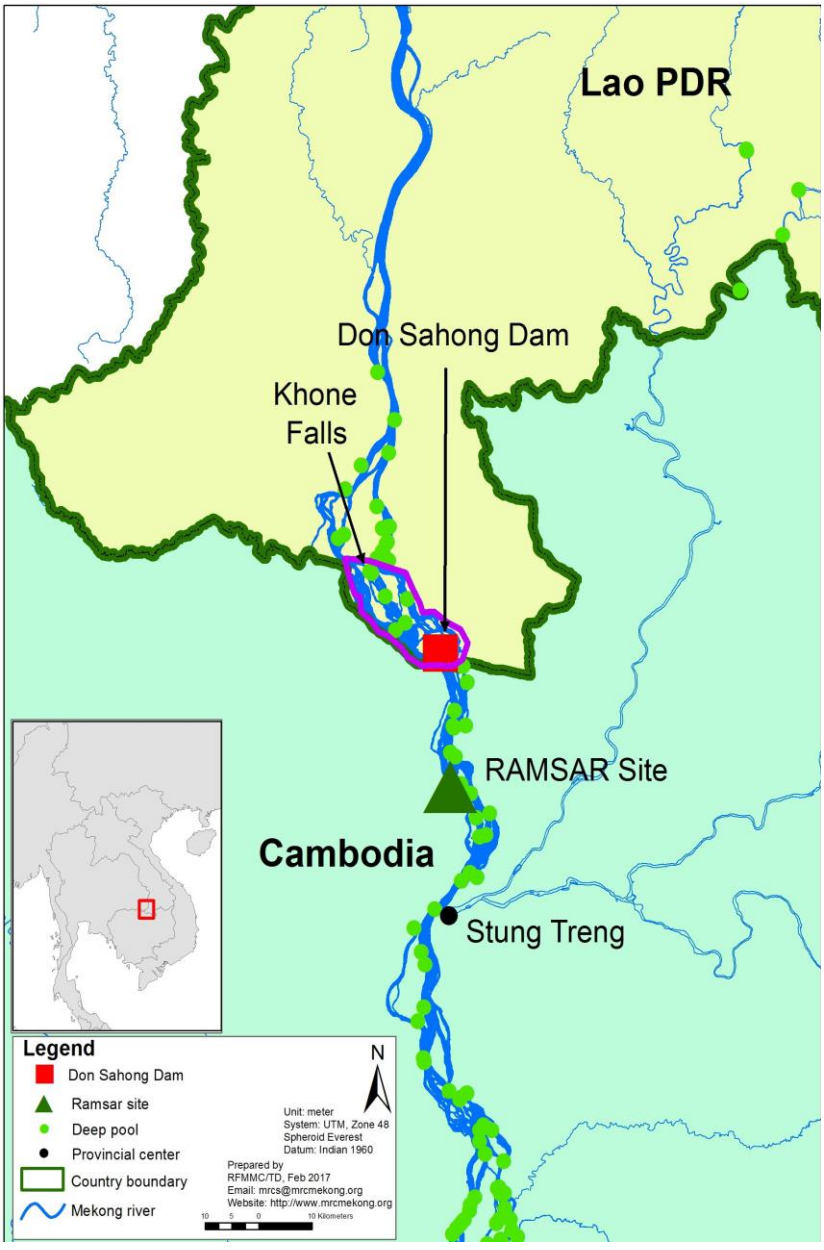
The joint rule development and the identification of other priority actions will take three years, which will be followed by the incorporation of the agreed rules, actions and investment in the relevant national policies and plans, and subsequently implemented. The costs for joint rule development and periodic meetings to discuss implementation progress and exchange knowledge and experiences is estimated at US$ 1 million.

Cross border water resources development and management, including environmental impact monitoring of Don Sahong hydropower project (Lao PDR, Cambodia)

The Khone Falls area in Lao PDR and Cambodia is an extremely scenic area and an environmental hotspot (Figure 4). It is a keystone location in the Lower Mekong Basin as it acts as a natural partial obstruction to migratory fish. But it is also a poor area where an increasing population live mostly from subsistence farming and fisheries. Economic and social development is needed to provide jobs, reduce poverty, and protect the unique environment.

Eco-tourism is increasing in the Lao portion, and the country started to further develop the area, including its water resources. The ongoing development of the 260 MW Don Sahong Hydropower Project (HPP) is controversial because of its location on a river channel (Don Sahong) within the Khone Falls area that is essential for fish migration and its proximity to a Ramsar site in Cambodia. Recently, both countries agreed to improve the international road and border checkpoint and commence electricity trading. There might be opportunities for increased trading in other sectors, such as agriculture and tourism.

Figure 4: Location of the Khone Falls and Cambodia Upper Mekong Joint Project



This joint project will inform mitigation and adaptive management measures at the Don Sahong HPP and Cambodia Upper Mekong, develop a longer-term vision of the Khone Falls and Cambodia Upper Mekong area, and prepare and implement projects and activities that generate benefits in both countries. There are three components: a joint environmental impact monitoring component, a shared visioning and planning component, and an implementation support component.

The environmental impact monitoring component will broaden the hydrological and fisheries monitoring by the Don Sahong HPP developer in terms of monitoring parameters and geographical area, which will include the Cambodia Upper Mekong with the RAMSAR site and surrounding ecosystem. The component will be implemented by a team of Lao, Cambodian and other experts, and managed by the MRCS. Stakeholders will be engaged and a webpage maintained with the collected data, analysis and recommendations for mitigation and adaptive management measures.

The shared vision and planning component will support socio-economic development in the transboundary Khone Falls and Cambodia Upper Mekong area through the preparation of a joint action plan of water-related projects and activities which will create transboundary benefits, such as the establishment of a transboundary park, the harmonization and improvement of fisheries regulations and management, and joint eco-tourism development. The component will be implemented by local Government agencies with support from a service provider (international organization or consulting firm), with the MRC in a coordination, facilitation and monitoring role.

The implementation support component will support the incorporation of the investments and activities of the joint action plan within the provincial socio-economic, spatial, and sectoral planning. It is expected that most of the joint action plan can be implemented at the national level, using existing provincial coordination mechanisms. In addition, the relevant implementing agencies in the two countries could meet yearly to discuss progress and exchange knowledge and experiences for joint learning. There may be scope for joint investments with benefit sharing deals, such as the establishment of a transnational park to boost tourism and socio-economic development, and to preserve the unique land and waterscape of the Khone Falls area.

The environmental impact monitoring component will be operationalized in 2017, followed by an implementation period until 2025. Its cost is estimated at US$100,000/year. The shared vision and planning process will be set up in 2017 and carried out during 2018-2021 (including pre-feasibility studies). Its cost is estimated at US$ 1.5 million. The support to the implementation of the joint action plan will commence in 2021 and its cost is to be determined.

Transboundary cooperation for flood and drought management in Thai-Cambodian border area – a part of the 9C-9T Sub-area (Thailand, Cambodia)

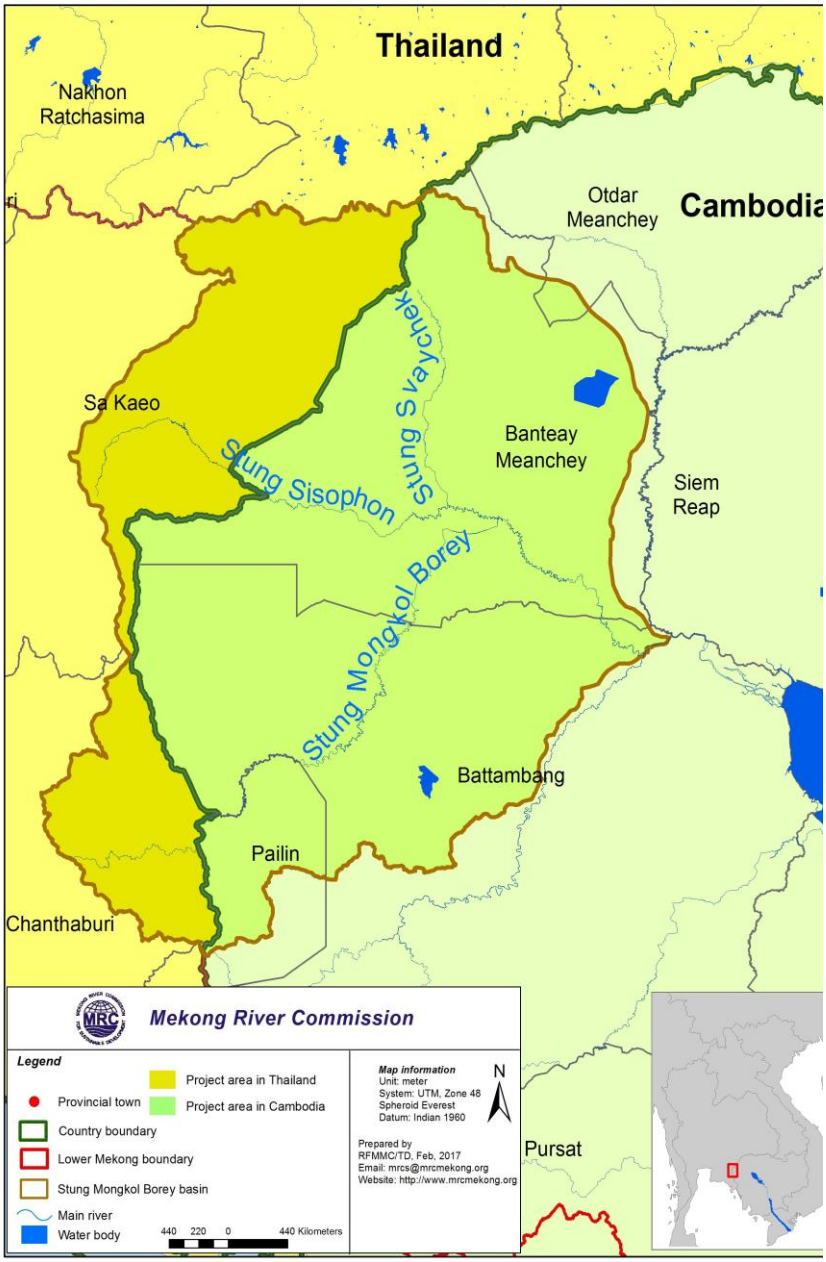
Occasionally, dangerous flash floods and regional floods cause considerable damage and loss of lives in a shared river basin that comprises the Tonle Sap sub-basin (or 9T sub-basin) in Thailand and the Stung Mongkol Borey sub-basin in Cambodia (see Figure 5). The shared river basin is part of the larger Tonle Sap Sub-area of the Mekong River Basin. Droughts are becoming another problem of concern in both parts of the shared river basin. The flood and drought risks will increase as climate change advances and both countries face increasing water demands from agriculture and public and industrial water supply.

Both countries have begun addressing these problems by improving hydro-meteorological data collection systems and constructing flood draining connections. But much more needs to be done. Past experiences demonstrated that uncoordinated development actions in the upstream and downstream sub-

basins will not effectively solve the recurrent flood and the drought problems. Accordingly, the two countries are seeking a concrete cooperation framework that would enable them to work jointly in mitigating the flood and drought problems effectively and efficiently and in a sustainable manner.

The joint project will increase (i) the capacity for transboundary integrated water resources planning and forecasting of floods and droughts and associated information services and (ii) provide water security, including measures against floods and droughts, to support the economic and social development in the project area. There are four components: a joint assessment and planning component, a coordinated implementation component in Thailand and Cambodia, and an implementation support component.

Figure 5: Location of Thai-Cambodian Border Area Joint Project



The joint assessment and planning component will prepare a longer term strategy and action plan with measures for the further reduction of flood and drought risks (such as flood dykes, retention reservoirs, stream and drainage improvements, land conservation, reforestation) and measures for the management of potential flood and drought damage (such as guidelines for spatial planning, coordinated forecasting and early warning services, and operational alarm systems in communities threatened by flash floods), and water resources development to support increases in water demand. The project will also support the incorporation of the various measures in the national/provincial socio-economic, spatial, and sectoral planning.

It is anticipated that the joint action plan can be implemented through coordinated national planning and implementation under the two implementation components. However, there may be scope for joint projects and activities (possibly with cost and benefit sharing), such as stream and drainage improvements in the border area and the development of a flood forecasting and early warning system. The implementation support component will support the coordinated implementation of the joint action plan and the preparation and implementation of possible joint projects based on a MoU or specific agreement.

MRC/MRCS will be the executing agency for the joint assessment and planning component with MOWRAM (Cambodia) and MONRE (Thailand) as the key implementing agencies working with several cooperating agencies in Thailand and Cambodia, including local agencies. Implementation support could be provided by a consulting firm. A steering committee could provide guidance and create consistency and synergies that can enhance the value of the basin's water resources. The implementation of the joint action plan by national agencies will be coordinated and experiences exchanged, with facilitation of the MRC.

The implementation arrangements for the joint project will be set up in 2017. The development and preparation and operationalization of the joint action plan will take 2.5 years including pre-feasibility level assessment of priority projects. The cost is estimated at US$ 1.2 million. The cost of the further preparation and implementation of measures will be determined during the joint planning phase.

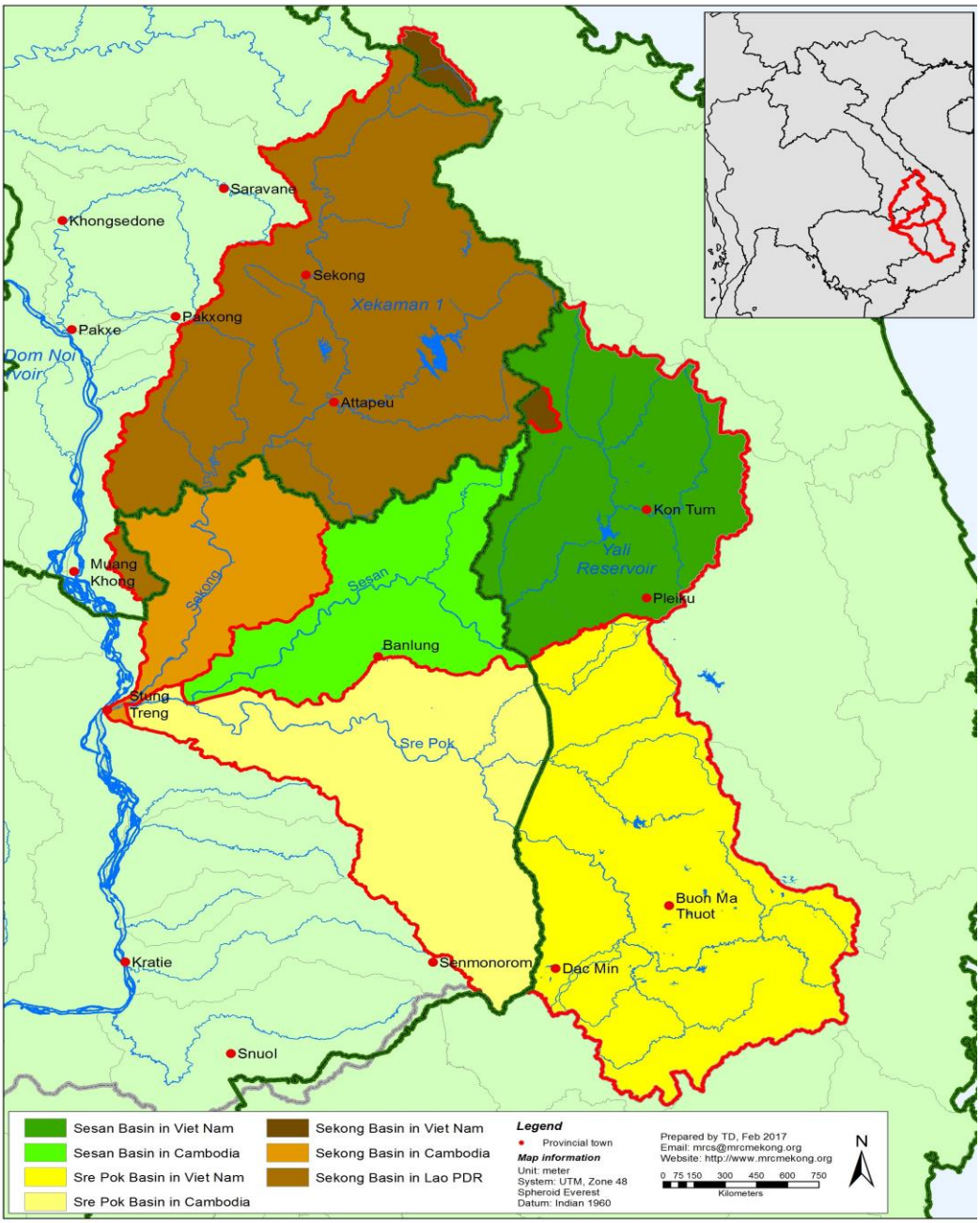
Sustainable water resources development and management in the Sekong, Sesan and Srepok river basins (3S Basin) (Viet Nam, Cambodia, Lao PDR)

The Sekong-Sesan-Srepok tributary basins are the only large transboundary tributaries in the Mekong Basin, contributing about 20% of the flow and 10-20% of the sediments of the Mekong mainstream. Large-scale water resources development for hydropower and irrigated agriculture started in the 1990s in the rapidly developing upstream portions of the Sesan and Srepok in Viet Nam. Recently, hydropower and other development commenced in the downstream portion of the Sesan and Srepok in Cambodia and on tributaries of the Sekong in Lao PDR (Figure 6).

A concern has been the national and sector oriented development and management of hydropower projects with limited consideration of other potential uses and the "healthy life of rivers", which has caused adverse transboundary impacts, including unusual flood events. Fish migration from the Mekong into the Sesan-Srepok Basin is blocked by dams. Planned hydropower development on the Sekong mainstream threatens the last free flowing tributary river in the Mekong Basin.

This joint project will strengthen coordinated national planning of the development and management of water and related resources in the 3S Basin, leading to coordinated national investments and possibly joint investments in the further improvement of hydro-meteorological systems, flood and drought forecasting and associated services, transboundary operational water management, and water resources development infrastructure. The project will also develop the capacity of water resources management agencies and the relevant provincial agencies and the NMCs to manage transboundary water resources and climate risks.

Figure 6: Location of the 3S Basin Joint Project



The joint project has three components: a cooperative regional assessment (CRA) for development and management of the 3S Basin, transboundary water resources management in the 2S Basin (Srepok and Sesan Basins, shared by Viet Nam and Cambodia), and transboundary water resources management in the Sekong Basin (shared by Lao PDR and Cambodia).

The CRA will strengthen coordinated planning and management of water resources in the 3S Basin in the face of future uncertainties including climate change, with a view to increasing national socio-economic benefits, minimizing negative tansboundary impacts, and improving water-related security (water, food, energy, environment, flood and droughts) in an equitable manner through cooperation between the 3S Basin countries. The CRA is a logical successor of

recent donor supported activities in the basin and complements ongoing initiatives of the WB, USAID, and others. The CRA will build trust and confidence among the countries and set the stage for discussing synergies and trade-offs of development plans, and considering joint (investment) projects that provide incremental benefits that can be shared.

The two transboundary management components focus on the improvement of transboundary management and cooperation in the 3S Basin in terms of compatible standards and systems for water-related monitoring, flood and drought forecasting, operational water resources management, and the associated information services and institutional arrangements. Also pre-feasibility level assessments will be conducted of promising joint investment projects and cost and benefit sharing options, which are identified in the CRA.

The implementing agencies will be the water resources management agency in Cambodia (MOWRAM), Viet Nam (MONRE), Lao PDR (MONRE) and their provincial departments, whose capacity will be strengthened to play their most challenging role by coordinating and steering sector agencies in an integrated multi-sector planning and management process. Important cooperation agencies will be the agencies responsible for the agricultural and energy sectors (MARD, MOFA, MRD, MOE, MAFF, MOIT, MEM, MME, EVN, EDL, EAC, MLMUP, MPWT and others). At the regional level, the project will be supported and overseen by the MRC and its NMCs. A steering committee could be set up to facilitate transboundary coordination and a Project Implementation Unit (PMU) established to manage the implementation of the joint project. The services of a consulting company with experience from similar assignments will likely be needed.

The planning and capacity building activities will likely last three years. The costs are estimated at US$ 2.5 million. The implementation of the identified and planned infrastructure and non-structural investments will last five years and their costs are to be determined. During this period, also the results of the CRA will be incorporated in the national socio-economic, spatial, and sectoral planning. Consultations and interaction with stakeholders and stakeholder groups will be effected in a formal and structured manner throughout the planning and implementation phases.

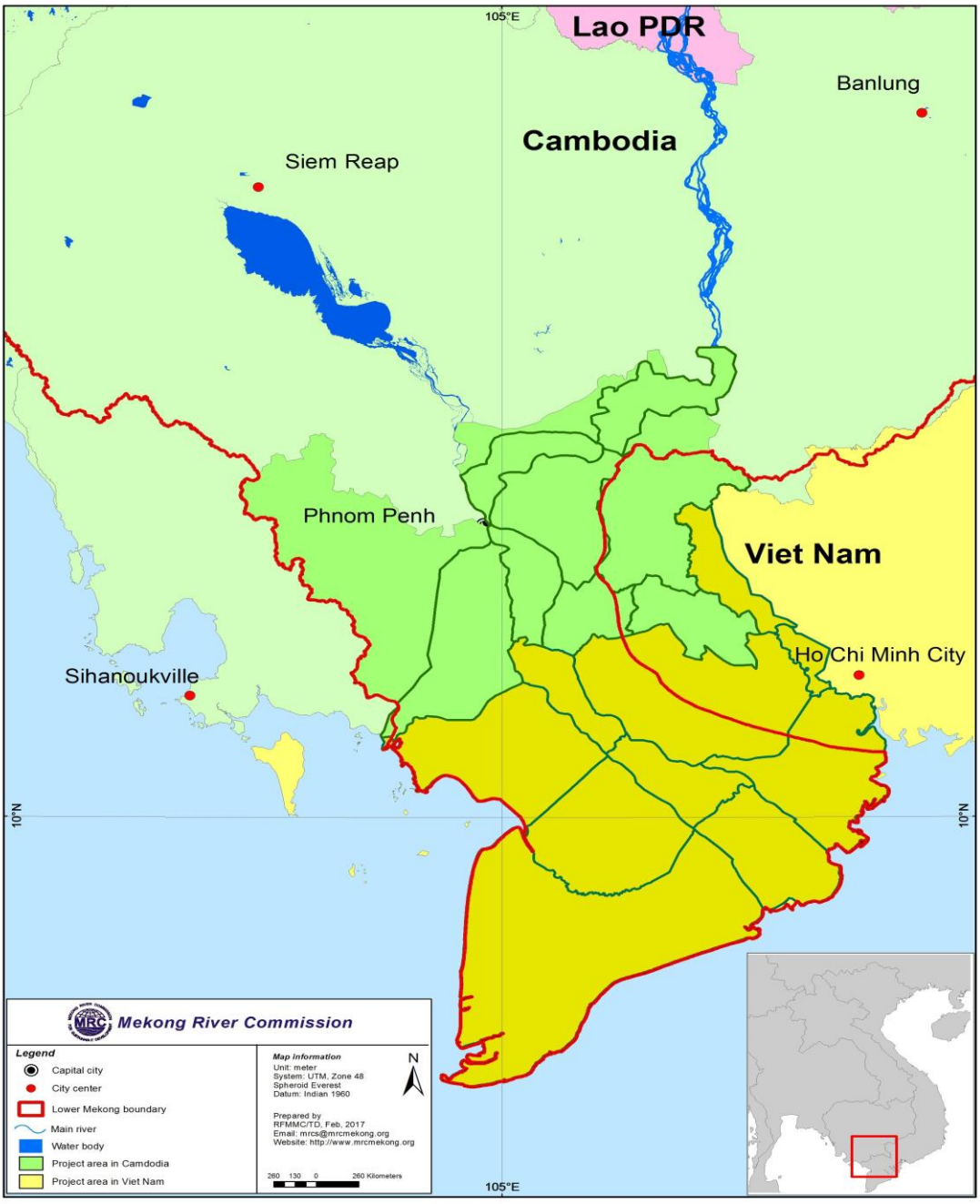
Integrated flood management in the border area of Cambodia and Viet Nam in the Mekong Delta for water security and sustainable development (Viet Nam, Cambodia)

The Mekong Delta begins at Kampong Cham in Cambodia and extends southwards to the East Sea in Viet Nam (Figure 7). Phnom Penh City is located in the middle of the Mekong Delta, where the Mekong River is divided into four main river branches: (i) the Upper Mekong River, (ii) the Lower Mekong River, (iii) the Bassac River and (iv) the Tonle Sap River which connects the Tonle Sap Great Lake to the Mekong River. In Viet Nam, the Mekong then divides into six main channels and the Bassac into three to form the “Nine Dragons” of the outer delta. The Mekong Delta represents one of the world’s most productive ecosystems.

Flood and drought risks in the Mekong Delta are increasing as populations and economies grow and climate change advances, putting more people and assets in harm’s way as recent floods in the region have demonstrated. A recent MRC/FMMP assessment (December 2015) indicates that flood risks could

increase substantially in the main cities of the Mekong Delta, and reach unacceptable levels already in 2030 because of climate change, floodplain development, and higher living standards.

Figure 7: Location of the Mekong Delta Joint Project



In the national planning of both countries, the management of floods and droughts have been prioritized to achieve the countries' socio-economic development goals. However, Cambodia and Viet Nam cannot achieve their water security goals alone. International experience shows that joint management and development of the Mekong Delta will be needed, possibly with cost and benefit sharing deals. This is particularly important in the border area between the two countries where border canals can be improved and flood diversions constructed.

This joint project will prepare and implement “no regret” investments and supporting measures in the border area of Viet Nam and Cambodia for flood diversion, agricultural improvements and other functions, and develop an integrated flood management strategy for the Mekong Delta, including a phased plan of investments and supporting activities. The project has two components: a planning component covering the Mekong Delta area and an implementation component that is directed at the preparation and implementation of investments in the border area between Viet Nam and Cambodia.

The planning component builds on several studies and assessments, strategies and plans that have been prepared during the last 10-20 years. The aim is to arrive jointly (Viet Nam and Cambodia), through a scenario-based shared vision process, at a common understanding of the strategic directions for socio-economic and spatial planning in the delta area, and the further projects and activities that are needed in the short to longer term to keep flood risks in urban and rural areas of the Mekong Delta at an acceptable level. It is anticipated that the major part of the projects and activities can be implemented nationally through coordinated national implementation, but there may be scope for joint investments and benefit and cost sharing.

The implementation component will support the preparation, detailed design, and rehabilitation and improvement of border canals between the Cambodian Provinces of Prey Veng and Svay Rieng (where the canals are named Prek Tanou and Prek Smao) and in the Viet Nam provinces of Dong Thap and Long An, as well as the construction of routes and zones for flood drainage, including from the Mekong and Bassac in the Viet Nam border area (and possibly the Cambodian border area). The proposed investments are a top priority for Cambodia and Viet Nam for early implementation as part of the Mekong Delta Strategy/Action Plan that results from the above planning component. The implementation will involve coordinated and joint investments, as well as joint decision-making on the management, operation and maintenance of the improved border canals.

The executing agencies will be MOWRAM in Cambodia and MARD and MONRE in Viet Nam. They will set up a steering committee with senior officials from the national planning and sector agencies, foreign affairs, relevant provinces, the MRC, and the supporting development partner(s). The steering committee will act as a “Mekong Delta” governance body and consider substantial project and policy issues and provide recommendations. A Project Implementation Unit (PIU) could be established to implement the joint project. The PIU would be staffed by experts from Viet Nam and Cambodia, as well as a few international experts. Consultations and interaction with stakeholders and stakeholder groups will be effected in a formal and structured manner throughout the planning and implementation phases.

The two project components can be implemented in parallel and inter-dependently. The implementation arrangements will be set up in 2017, followed by the preparation of the Mekong Delta Strategy/Action Plan during 2018-2020 and the subsequent incorporation of the strategic directions, investments and actions in the national socio-economic, spatial, and sectoral planning. The cost is estimated at US$ 2.5 million. The preparation of the investments in the border canals and floodways are scheduled from 2018 to 2022 (including feasibility studies and detailed design), followed by the implementation of the feasible and

agreed projects from 2023 onwards. The total cost of the two pre-feasibility studies is estimated at US$ 2 million. Other costs are to be determined.

Cross-cutting issues

All joint projects address transboundary issues and are prioritized in national planning frameworks. The projects address a range of cross cutting issues that figure prominently in the UN Sustainable Development Goals, including the following:

Poverty alleviation and economic growth (SDG 1 and 8). All joint projects will create economic benefits and employment over and above what could be achieved by national plans and actions. At the same time, the strategies and rules that will be developed under the planning component of the joint projects offer the opportunity to ensure that the achievement of benefits for rural and urban people must be balanced with the existing needs of poor people, who depend on the rich fisheries and other natural resources in the basin for their food security and livelihoods;

Gender equality (SDG 5 and others). All joint projects offer opportunities to improve gender equality through the collection or assembling of disaggregated data (sex, age, ethnicity etc.) and the development of strategies and action plans that will be developed. These will include actions to reduce the risks of floods and droughts to which women are more vulnerable than men due to their higher dependence on natural resources, and social barriers that limit their adaptive capacity;

Regional integration (SDG 6). The joint projects will lead to higher levels of transboundary cooperation through the joint planning component of each project and the subsequent coordinated or joint implementation of compatible facilities (such as hydro-meteorological networks and flood and drought forecasting systems and the associated information and early warning services) and water infrastructure in border areas (such as canals and floodways). This may benefit many sectors and contribute to the stability in the region;

Disaster risk reduction and climate change (SDG 9 and 13). Most joint projects address disaster risk reduction and climate change and its impacts. For some projects, such as the Mekong Delta Joint Project and the Thai-Cambodian Border Area Joint Project, it is a project aim. These projects will develop and implement a strategy and action plan that will reduce flood and drought risks and build resilience and adaptive capacity to climate-related hazards and natural disasters;

Other cross cutting issues that most joint projects address are food security (SDG 2), institutional development and capacity building (SDG 4 and 16), and the protection and restoration of ecosystems and watersheds (SDG 6 and 15).

4 Implementation and funding

Implementation of the joint projects

Planning component. All joint projects involve a planning component, which will be based on IWRM principles and address uncertainties, such as climate change. Depending on the project, this may include the development of joint rules, or a joint strategy and action plan of structural and non-structural projects, or the preparation of early "no regret" projects, such as the extension/improvement of monitoring and forecasting systems and the improvement of border canals.

Implementation components. The further preparation and implementation of the structural and non-structural projects can in many cases be implemented at the national level by the responsible national agencies, albeit with transboundary coordination to ensure that non-structural projects and activities (such as hydro-meteorological flood forecasting systems and associated information services) are compatible and linked, and structural projects (such as reservoirs and water diversions) are aligned with the basin wide strategy.

However, there is also scope for joint projects and activities, possibly with cost and benefit sharing (such as a transboundary park or river stream and drainage improvements in the border area). The implementation of such projects will require higher levels of collaboration based on a Memorandum of Understanding or a specific agreement between the implementation agencies involved in both countries.

The implementation arrangements of the five joint projects come in various forms, depending on the nature of the project and preferences of the riparian countries (see Chapter 3 and Annex 1-5). In general, the implementation arrangements are in line with the roles shown in Table 2 for the main phases of the joint project cycle.

Table 2: Roles in the joint project cycle

Role	Main project cycle phase		
	Planning	**Project preparation**	**Project implementation**
Implementing agency	• Responsible agencies at national and provincial level • MRC	• Responsible agencies at national and provincial level	• Responsible agencies at national and provincial level
Cooperating agency	• Other agencies	• Other agencies	• Other agencies
Transboundary coordination	• Existing mechanisms • Steering committee • MRC	• Existing mechanisms • Steering committee	• Existing mechanisms • Steering committee
Supporting	• MRC • Consulting firms • International organizations	• Consulting firms • MRC (review of preparation docs)	• Construction companies • Suppliers of goods
Funding	• Bilateral donors	• IFIs • National budget	• National budget • Loans (IFIs, banks)

	• International Finance Institutions (IFIs)		
Monitoring and evaluation	• Responsible agencies • MRC	• Responsible agencies • MRC	• Responsible agencies • MRC (impacts)

Table 2 shows that joint projects are planned, prepared and implemented by the responsible line agencies in the countries involved. In some cases, MRC implements the planning component of a joint project. In most cases, national cooperation agencies will support the implementation of the multi-sector projects. Transboundary coordination will build on existing mechanisms. In some cases, a transboundary steering committee will be established to perform the necessary transboundary coordination. In other cases, the MRC leads the transboundary coordination during the planning stage of joint projects.

In most cases, contractors, such as consulting and construction firms, will support the implementation of the joint projects. In some cases, the MRC supports the planning component of a joint project through the running of one or more expert groups. During project preparation, MRC could add value by reviewing TORs and project preparation documents, such as feasibility studies and EIAs and SIAs. MRC supports the appraisal of prepared structural projects through the implementation of the MRC Procedures, particularly the PNPCA.

Otherwise, the MRC has no or a limited role in the implementation of joint projects. If requested, MRC could also provide transboundary coordination, dialogue and mediation. In exceptional cases, MRC could act as the co-implementer for non-structural projects, such as navigation aids, water monitoring systems, and flood warning systems. MRC will monitor and evaluate the impacts of joint projects.

Funding of the joint projects

Only the cost of the planning component of the joint projects has been estimated in Annex 1-5. They are summarized in Table 3 below. The duration of the planning component of the joint projects varies between 2 and 3.5 years. The cost of further project preparation and implementation of the structural and non-structural projects will be determined during the implementation of the planning component.

Table 3: Funding needs for joint projects

Implementing country	Title of joint projects	Estimated costs (US$) of planning component
Lao PDR and Thailand	Lao-Thai safety regulations for navigation	1,000,000
Cambodia and Lao PDR	Cross border water resources development and management, including environmental impact monitoring of Don Sahong hydropower project	1,500,000 100,000/year (impact monitoring Don Sahong HPP)
Cambodia and Thailand	Transboundary cooperation for flood and drought management in Thai-Cambodian border area–a part of 9C-9T Sub-area	1,200,000
Cambodia, Lao PDR, Viet Nam	Sustainable water resources development and management in the Sekong, Sesan and Srepok river basins (3S Basin)	2,610,000

Cambodia and Viet Nam	Integrated flood management in the border area of Cambodia and Viet Nam in the Mekong Delta for water security and sustainable development	2,730,000 2,000,000 (pre-feasibility studies of border canals and floodways)

Funding for the implementation of the planning component of the joint projects is sought from development partners with experience in the implementation of such projects. The subsequent implementation of the structural and non-structural projects will be funded from the national budget.

5 Next steps

The MRC and the planning departments of the involved national line agencies, who all regularly interact with development partners, will use this report to promote the five joint projects among development partners for funding and implementation support. As required, project promotion will be supported by the MRC Joint Committee at the strategic and policy level and the MRC Council at the political level.

A national working group in each country will be established to support the coordination and negotiation between the countries sharing the joint projects. The role of the national working group will also assist the responsible implementing agencies with setting up the implementation arrangements, discussion and negotiation towards the finalization and agreement reached between the countries jointly implement the joint projects. The national working group will comprise staff of national implementing agencies concerned, NMCS and the MRCS.

In addition, the MRC could implement a regional donor meeting and/or a donor meeting in each of the LMB countries to further promote the joint projects. Since the joint projects address several SDG Goals and create mutual benefits in terms of socio-economic development, water security, climate change adaptation and environmental protection, they should be interesting for a range of development partners:

- Some of the joint projects would qualify for incorporation in the Action Plan of the World Bank supported Mekong IWRM Programme. This would include the projects in the Mekong Delta and 3S Basin, which build on ongoing transboundary dialogues, activities and investments under this Programme;
- Several joint projects could qualify for support from available climate funds, such as the Green Climate Funds and he Global Environment Facility, including the joint project “transboundary cooperation for flood and drought management in the Thai-Cambodian border area”;
- Some joint projects may qualify for incorporation in the Regional Investment Framework (RIF) of the ADB/GMS; and
- The IWRM-based assessments, joint planning, and transboundary monitoring activities within the planning component of most joint projects would fit well in the policy of many grant donors.

Depending on the requirements of the interested development partners, the next step would be the preparation of TORs, Project Identification Document (PID) or Project Proposal. Such documents would be prepared in close collaboration with the implementing government agencies and other key stakeholders, and based on field work as appropriate.

Annex 1: JPIN Lao-Thai safety regulations for navigation (Thailand, Lao PDR)

Joint Project Information Note

Project title	**Lao-Thai safety regulations for navigation**
Countries	**Thailand and Lao PDR**
Issues	The recently prepared Master Plan for Regional Waterborne Transport in the Mekong River Basin (December 2015) provides a phased action and investment plan covering a wide range of structural and non-structural projects and activities. For the safety of navigation of the Mekong mainstream from Chiang Saen (Thailand) to Khone Falls (Lao PDR), it was suggested that Lao PDR and Thailand should work together towards the adoption of “common safety regulations for ports, vessels and navigation, as well as anti-pollution rules". Two of the priority actions of the Master Plan (see Section 5.1.6 – Regulatory Actions): • Adopt, implement and enforce harmonized safety and anti-pollution rules for Lao PDR and Thailand; and • Adopt plans and procedures for port safety and emergency response. Thailand and Lao PDR have agreed to initiate these priorities and related matters as a joint project under MRC’s basin planning process. To the extent that no national rules are currently available in the countries, it is preferable to immediately draft a common set of rules rather than first elaborate two national sets of rules which then need to be harmonized. The joint rule making process will take into account the results of similar activities under the Quadripartite Agreement between China, Myanmar, Thailand and Lao PDR in the Upper Mekong and the Navigation Agreement between Cambodia and Viet Nam in the Lower Mekong.
Objectives	There are two objectives: 1) To develop and agree on common regulations for safety of ports, vessels and navigation, as well as rules for pollution prevention, and to identify other actions of mutual interest to enhance navigation on the Mekong; 2) Implement and enforce the common rules at the national level with periodic exchange of progress and experiences between the two countries.
Project Components	The components and activities of this joint project are guided by the above-referenced navigation master plan and supporting documents. The rules will be based on international and regional best practice, including those in the Upper Mekong and Lower Mekong. The Project has four components: **1) Common safety and anti-pollution rules**, including inspection of vessels. This addresses a wide range of vessel safety and

	pollution prevention and risk reduction measures, including: navigation rules; vessel safety standards; working practices; the management of vessels; the carriage, handling and storage of dangerous goods; and emergency preparedness on board and emergency response management by vessel operators. The activities will include: a) Collection of and analyses of existing rules and regulations in the light of the Quadripartite Agreement, treaty obligations, and international and regional best practices; b) Preparation of draft rules and regulations; c) Negotiation and finalization of the rules and regulations; d) Integration of the rules and regulations into the national legal and regulatory instruments; and e) Instruction and training of the competent authorities in the implementation and enforcement of the new rules and regulations at the national level. **2) Rules for port safety and emergency response**. All ports, especially passenger ports, should have a minimum of safety equipment. In many ports, emergency response planning and equipment is very limited or non-existing. Taking into consideration the (forecasted) passenger throughput, ports should be able to efficiently deal with an emergency. Activities will include: a) Collection of and analyses of existing rules, regulations, procedures and plans in the light of the Quadripartite Agreement, treaty obligations, and international and regional best practices; b) Preparation of draft rules, regulations, procedures and guidelines for implementation at the national level; and c) Instruction and training of the competent authorities in the implementation and enforcement of the new rules and regulations. **3) Other joint actions for navigation safety**. The action and investment plan of the Masterplan for Regional Water Borne Transport in the Mekong River Basin will be jointly reviewed by the two countries with a view to identifying other priority actions of mutual interest which would increase navigation safety and emergency preparedness and response, which could include but not limited to: waterway improvement activities, aids to navigation activities, environmental activities, institutional development activities, and capacity building activities. Identified priority actions and related investments will be further prepared and implemented at the national level. For any joint action to be implemented on the mainstream, a memorandum of understanding or specific agreement between implementing agencies involved in both countries should be put in

	place to ensure continued coordination and timely mobilization of resources. **4) Support to national implementation**. Implementation of the established rules and regulations, as well as the actions and investments identified under Component 3, will be carried out by the relevant responsible Government agencies in the two countries. The implementing agencies will meet yearly to discuss progress and exchange knowledge and experiences for joint learning.
Relevance, Importance, linkages	The proposed joint project is of basin-wide significance as it enhances transport of (bulk) goods and people between the Mekong Basin countries. The project contributes to Development Opportunity 4 (navigation) and Strategic Actions 2 (Optimize basin-wide sustainable development and costs and benefit sharing), 6 ((Enhance information management, communication and tools) and 7 (Increase cooperation with partners and stakeholders) of the Basin Development Strategy. The project is a priority in MRC's Master Plan for Regional Water Borne Transport of the LMB countries that assesses the impacts of two navigation development scenarios and predicts major increases in navigation and the associated socio-economic benefits. The project will contribute significantly to the implementation of MRC's Regional Action Plan for Transportation, Handling and Storage of Dangerous Goods along the Mekong River (2012). The project is linked to the national navigation plans of Thailand and Lao PDR. The next update of these plans will incorporate the agreed new actions and investments in the navigation master plan, as well as relevant (emerging) implementation results from this joint project as well as other projects and activities. The project is also linked to the activities under the Quadripartite Agreement and the navigation related activities of Viet Nam and Cambodia (see under "Issues").
Implementation arrangements	Given the basin-wide nature of this joint project, it will be executed by the MRCS (in coordination with the NMCS in the two countries), and implemented by the Waterway Department of Lao PDR and the Marine Department of Thailand. Cooperating agencies include the local port authorities, and vessel operators. A Steering Committee comprising of members from the implementing agencies and selected cooperating agencies from countries (upon recommendation) could be established to provide guidance to the MRCS, help solve specific constraints and problems. The MRCS navigation specialist will coordinate one or more expert groups to support the implementation of Component 1, 2 and 3. The expert group(s) will comprise of Thai and Lao PDR experts and Government officials with knowledge of rule

<table>
<tr><td></td><td>preparation and related activities under the Quadripartite Agreement. International expertise will likely be needed as well.

The downstream countries (Cambodia and Viet Nam) will be engaged in the process, given their interest in regional trade and the improvement of navigation on the Mekong. They also have useful experiences with similar work downstream of Phnom Penh to share.

During the implementation of the project, key stakeholders such the vessel and port operators will be engaged through surveys and consultation meetings.</td></tr>
<tr><td>Impacts</td><td>The impacts on the countries, vessel operators, the people along the river, and the riverine environment are mostly positive. The aforementioned navigation masterplan predicts significant increases in navigation on the Mekong mainstream. The new regulation and rules will make navigation and tourism services more attractive and protect workers, passengers and the environment, and the local population along the Mekong mainstream and in the port areas in the project area.

Identified investments for enhancing navigation safety under Component 3, such as dredging and river training, could cause negative environmental and social impacts, which need to be assessed through the SAE, EIA, and SIA process, in line with national laws and regulations.</td></tr>
<tr><td>Risks and challenges</td><td>The risks and challenges are mainly related to the implementation arrangements (see above). Whether or not the project’s objectives will be achieved depends for a large part on the drive, skills and experience of the MRC coordinator of the expert group(s) and the composition and expertise of the expert group(s).

The proposed activities have been partially implemented in other parts of the Mekong mainstream and in comparable rivers elsewhere, and the results in terms of rules, laws, regulations, procedures, guidelines and plans are readily available. Therefore, technical risks and challenges of this joint project are limited.

The risks and challenges during the implementation of the agreed rules and actions at the national level could be significant and these will be identified during the preparation of Component 4, based on the results of Component 1 to 3.</td></tr>
<tr><td>Work plan</td><td>The work plan comprises the following main elements:
<table>
<tr><th>Activity</th><th>Tentative timeline</th></tr>
<tr><td>1) Promotion of the project for funding and implementation (role of MRCS and NMCSs)</td><td>Ongoing</td></tr>
<tr><td>2) Set up of the expert group(s) and the operationalization of the MRC coordinator/facilitator</td><td>Mar-Jun 2017</td></tr>
</table>
</td></tr>
</table>

	3) First meeting of the expert group(s) and preparation of a detailed work plan	Jul-Dec 2017
	4) Operation of the expert group(s) for Component 1 and 2	Jan 2018 – Dec 2019
	5) Operation of the expert group for Component 3	Jul 2019 – Dec 2020
	6) Implementation of the agreed rules, actions and possible investments at the national level (Component 4)	From Jan 2019 onwards
	7) Annual joint meetings to discuss progress and exchange knowledge and experiences	From 2021 onwards
	8) Stakeholder consultations	Intermittently

Costs and financing

The implementation of Components 1-3 will be carried out with financial support from a development partner. The estimated costs are:

Activity	**Estimated costs (US$)**
1) Promotion of the project for funding and implementation (role of MRCS and NMCSs)	In kind
2) Set up of the expert group(s) and the operationalization of the MRC coordinator/facilitator	In kind
3) First meeting of the expert group(s) and preparation of a detailed work plan	50,000
4) Operation of the expert group for Component 1, including, the surveys, stakeholder consultations, and the delivery of the results	200,000
5) Operation of the expert group for Component 2, including the surveys, stakeholder consultations, and the delivery of the results	100,000
6) Operation of the expert group for Component 3, including assessments for the further identification of actions and investments for enhancing navigation safety	150,000
7) Implementation of the agreed rules, actions and possible investments at the national level (Component 4)	N/A
8) Annual joint meetings to discuss implementation progress and exchange knowledge and experiences, and get feed-back from key stakeholders	100,000 (five years)

	Total	**1,000,000**
M&E	Implementation progress will be measured against the time line in the above work plan and the detailed work plan that will be prepared by the expert group(s). Impact monitoring will track whether the objectives have been achieved. Indicators are: • Common rules for the safety of navigation and vessels are agreed; • Common anti-pollution rules have been agreed; • Common rules for the safety of ports have been agreed; • All agreed rules are integrated into the national legal and regulatory framework.	
Next steps	The promotion of the project for funding and implementation by the MRCS and NMCSs is ongoing and could be completed by March 2017.	

Annex 2: JPIN Cross border water resources development and management, including environmental impact monitoring of Don Sahong hydropower project (Lao PDR, Cambodia)

Joint Project Information Note

Project title	**Cambodian-Lao cross border water resources development and management, including environmental impact monitoring of Don Sahong hydropower project**
Countries	**Cambodia and Lao PDR** (transboundary Khone Falls and Upper Mekong area in Cambodia)
Issues	The Khone Falls area in Lao PDR and Cambodia is an extremely scenic area and an environmental hotspot. It is also a keystone location in the Lower Mekong Basin as it acts as a natural partial obstruction to migratory fish moving between spawning and nursery areas and feeding and refuge areas. The increasing population in the Khone Falls area live mostly from subsistence farming and fisheries. Most people are poor and the environmental and associated social costs are increasing due to their greater use of natural resources. Economic and social development is needed to provide jobs, reduce poverty and protect the unique environment. It is crucial that the natural resources are used wisely so that environmental degradation and reduction of fish migration can be avoided. Eco-tourism is increasing in the Lao portion, and the country started to further develop the area, including its water resources. The development of the 260 MW Don Sahong HPP is complex because of its location on a river channel (Don Sahong) within the Khone Falls area that is essential for fish migration. In addition to adverse fisheries, Cambodia anticipates adverse impacts on a nearby RAMSAR site and on river morphology in the Cambodian Upper Mekong area. On the other hand, there is the opportunity of increased cross border economic cooperation and trade between Lao PDR and Cambodia, including in the energy, agriculture and tourism sectors. Recently, both countries agreed to improve the international road and border checkpoint near the Khone Falls area and commence electricity trading in the area. This joint project will implement the environmental impact monitoring of the Don Sahong HHP as recommended in 2014/2015 during MRC's PNPCA process of the Don Sahong HPP. The joint project will also support collaborative transboundary planning in the Khone Falls area and identify investment projects and measures. It is expected that most (but not all) of the identified projects and activities can be further prepared and implemented at the national level in a coordinated fashion between the two countries.
Objectives	There are two objectives: 1) To monitor and report on the environmental impact of the Don Sahong HPP to inform mitigation and adaptive management measures, and monitor their effectiveness; and

	2) To support a shared vision planning process in the transboundary Khone Falls area (within the wider context of Southern Lao PDR and Cambodia Upper Mekong area) to develop a commonly shared and supported strategic long-term vision and identify the short and longer term projects and activities that can be implemented.
Project Components	There are three components in this joint project: a joint (Cambodia-Lao PDR) environmental impact monitoring component, a joint/coordinated visioning and planning component, and an implementation component, as follows: **<u>1) Environmental impact monitoring</u>**. This component will extend the hydrological, sediment, fisheries (FishMAP programme) and ecological monitoring by the Don Sahong HPP developer, as described in the Section 7.3 (Recommendations) of the Technical Review Report on Prior Consultation for the Proposed Don Sahong HHP of January 2015. This includes the broadening of monitoring in terms of monitoring parameters and geographical area, including the expansion of the FishMAP programme upstream to Pakse and downstream to Stung Treng, as well as to other channels in the Khone Falls area (building on the existing fisheries monitoring and research programmes, including the extensive fisheries monitoring and mitigation studies by the Don Sahong HPP developer during the past several years with technical support from a panel of Lao and Australian fisheries experts), the monitoring of water quality, sediment transport, riverbank morphology, the RAMSAR wetland ecosystem, and the Khone Falls landscape. The component will be implemented in close collaboration with the developer (see under "Implementation arrangements"). To prevent misperception about the positive and negative impact of the Don Sahong HPP, both Governments must ensure that monitoring data and their analysis will be made available to the public. The results would inform mitigation measures and adaptive management measures, including for the attraction of fish into the Hou Xang Pheuak, new fish passages in the Hou Xang Pheuak, and the occasional clearance of flow obstructions by dead trees, leaves etc. in the Hou Sadam. Activities will include: a) Set up the implementation arrangements in consultation with the Don Sahong HPP developer. There are a few options as described under "Implementation arrangements"; b) In consultation with the Don Sahong HPP developer, design and operationalize the broadened environmental impact monitoring programme, including but not limited to: (i) fish ecology, Ramsar sites fish habitats, fish migration, the number of fishermen, fish catch, and fishing gear used in the Khone Falls and wider Pakse-Stung Treng area, (ii) parameters related to fisheries management, including the legal and institutional framework and its implementation and enforcement; (iii) the effectiveness of the fish passages in Xang Pheuak and Hou Sadam in the Khone Falls area, and

	(iii) other indicators, including hydrology, riverbank erosion, sediment transport, aquatic ecosystems, and others in the Khone Falls and wider Pakse-Stung Treng area; c) Implementation of the environmental impact monitoring programme in accordance with the work plan; d) Analysis and recommendations for mitigating and adaptive management measures, including modifications in Khone Falls channels to improve fish passage, fish hatcheries, monitoring and communication equipment, and others; e) Recommendation of measures that can be taken beyond the Khone Falls area (i.e. in the Cambodia Upper Mekong); f) Maintenance of a webpage with the collected data, analysis and recommendations; and g) Annual consultation meetings with key stakeholders in the project area. **2) Transboundary development planning**. This component will support the socio-economic development in the transboundary Khone Falls area through shared vision planning and the identification of water related development and management projects and activities that create mutual benefits that can be shared between Cambodia and Lao PDR, such as (i) the establishment and joint management of a transboundary park and the associated facilities and public and commercial services, (ii) the harmonization and improvement of fisheries regulations and management in the border area (also building on the Mekong-Sekong Fisheries Management dialogue of the Mekong IWRMP), (iii) the improvement of connectivity between the Lao and Cambodian parts (transport, electricity), (iv) joint eco-tourism development, and (v) the extension and improvement of agriculture and trade. Activities that will be implemented jointly by the key stakeholders at both sides of the border with expert support and facilitation include: a) Review of provincial and national plans socio-economic and sector plans, and identify problems, issues and opportunities in the Southern Laos and Cambodian Upper Mekong area; b) Make an inventory of the water and related resources, existing water use, planned and potential future development, and the distribution of the water management responsibilities across the various agencies; c) Make a SWOT analysis of the Khone Falls area with the wider context of Southern Lao PDR and the Cambodian Upper Mekong area. Take the emerging results of Component 1 into account; d) Formulate a few different but credible long-term socio-economic scenarios for the Khone Falls area (taking upstream climate and the wider area into account), and identify and formulate a desired future, a commonly shared and supported,

	long-term socio-economic vision and associated spatial plan of the Khone Falls area (within the wider context of Southern Lao PDR and Cambodia Upper Mekong area); e) Based on the vision, explore possible 'no-regret' water related structural and non-structural projects and activities that can be implemented in the short-term, as well as medium and longer term investments and measures, and related these to the various water-related sectors, socio-economic planning, and to spatial planning; f) Prepare the short-term, no-regret measures up to pre-feasibility level through feasibility assessments and studies, including testing of robustness in the face of climate change and other uncertainties; g) Prepare a joint action plan on the development and management of water related resources in the Khone Falls area and agree on the implementation and coordination mechanisms (all within the context of the wider area of Southern Lao PDR and the Cambodian Upper Mekong area. **3) Support to implementation**. It is expected that most of the joint action plan can be implemented at the national level, using existing provincial coordination mechanisms, and with funding and technical support from third parties, including the MRC. The relevant implementing agencies in the two countries could meet yearly to discuss progress and exchange knowledge and experiences for joint learning. However, there may be scope for joint investments with benefit sharing deals, such as the establishment of a transnational park to boost tourism and socio-economic development and to preserve the unique land and waterscape of the Khone Falls area.
Relevance, Importance, linkages	The nature and scope of this joint project follows the results of recent regional discussions about the importance of transboundary cooperation in the development and management of the Mekong, including the results of the recent PNPCA process of the Don Sahong HPP. This joint project very much responds to the intention of the 1995 Mekong Agreement and the role of MRC in facilitating such projects and monitoring their impacts. The joint project will improve cooperation between Cambodia and Lao PDR through the implementation of joint activities that build trust and support the socio-economic development of the Khone Falls area and the sustainable management of the transboundary water resources in this area. Component 1 is directly linked to outcome of the PNPCA process on the Don Sahong HHP and the concession agreement of the developer. The component is of basin-wide significance as it aims at maintaining (and possibly increasing) the fish migration over the Khone Falls. The joint project is linked to most of the strategic priorities in the Basin Development Strategy, including Priory 1 (Reduce remaining knowledge gaps to minimize risks), Priority 3

	(Strengthen the protection of mutually agreed environmental assets), Priority 6 (Enhance information management, communication and tools), and Priority 7 (Increase cooperation with partners and stakeholders). Component 2 and 3 are linked to the provincial/national plans for the Southern Laos and Cambodian Upper Mekong area, including relevant MRC sub-area reports. These components address development opportunities in the Basin Development Strategy, as well as Strategic Priority 2 (Optimize basin-wide sustainable development and cost and benefit sharing), Priority 5 (Improve national water resources development and management), and Priority 7 (Increase cooperation with partners and stakeholders).
Implementation arrangements	There are two possibilities for the implementation of Component 1: 1) Full collaboration with the Don Sahong HPP developer. There will be one team of Lao, Cambodian and other experts responsible for the environmental monitoring and that team (possibly including the experts that have been involved in fisheries and environmental monitoring and research during the last years). Funding would come from the developer (for the monitoring agreed during the PNPCA process, see Section 7.3 of the Technical Review Report on Prior Consultation for the Proposed Don Sahong HHP of January 2015) and the MRC/development partner(s) for the broadening of monitoring in terms of the number of monitoring parameters and geographical area (see under “Project components”); 2) Coordination with the Don Sahong HPP developer. In consultation with the developer, MRC broadens the environmental monitoring programme of the developer to describe the full picture of positive and negative impacts in a larger geographical area (see under “Project components”) and shares data and information with the developer to inform mitigation and adaptive management by the developer. In this case there will be two monitoring teams: one team funded by the developer and one team funded by the MRC/development partner(s). In both cases, the MRCS and the relevant NMCSs would provide administrative, logistic and procurement support. Results would be periodically the MRC JC and annually to the Council. Ideally, Component 2 will be implemented by the local Government agencies and representatives of key stakeholders in the Southern Lao PDR and the Cambodian Upper Mekong area, with coordination and technical and facilitation support from a service provider that has experience with local, transboundary socio-economic and spatial development planning. The service provider could be a consulting company, a NGO, a RBO, a water board, or a transboundary organization, which would be contracted based on a detailed TOR. During the implementation, twinning arrangements could be set up between local agencies and appropriate foreign agencies. The implementation arrangements, including the procurement of the service provider,

	will depend to some extent to the profile of the local Government agencies and the type of supporting development partner. MRC would have a coordination, facilitation and M&E role. Component 3 will see the joint action plan prepared under component 2 implemented at the national level with transboundary coordination through the two border provinces. However, the action plan may also include joint projects with cost and benefit sharing, such as the development of a transnational park. The service provider could continue to provide technical and coordination support to the implementation of the various investment projects and activities in the plan. This would include the organization of an annual meeting of relevant implementing agencies and key stakeholders in the two countries to discuss progress, share data and information, and exchange knowledge and experiences for joint learning. MRC could facilitate, monitor, and disseminate experiences and lessons learnt.
Impacts	The implementation of Component 1 ensures the maintenance (and possibly improvement) of fish migration across the Khone Falls with basin-wide benefits for people and the environment. Given the decreasing numbers and proportions of large fish, and decreasing catch per unit effort, such a joint project should have been a priority even without a hydropower project. The monitoring of other indicators (than related to fisheries) will ensure that the agreed minimum flows will be passed on by the developer to the touristic Phabeng Falls at the border between Lao PDR and Cambodia. The implementation of Component 2 and 3 will help ensure that the economic and social development in the Khone Falls area is integrated and sustainable, with benefits to the local people and unique environment in both Cambodia and Lao PDR. Some identified investments for the development and management of water related resources under Component 2 could cause negative environmental and social impacts, which need to be assessed through the SEA, EIA, and SIA process. But doing nothing is not an option as an increasing poor population would lead to high environmental impacts. Component 2 and 3 will also enhance the integration of the communities at both sides of the border. The implementation of all three components will enhance the common understanding of the current situation and development and management opportunities of the water and land related resources in Southern Laos and the Cambodian Upper Mekong area.
Risks and challenges	The risks and challenges are mostly related to: (i) the willingness of agencies and people to work together and share data and information and (ii) the quality of the collected data and produced information. The first project objective can be achieved with good cooperation between the developer of the Don Sahong HHP and the MRC, and with the backing from the Lao Ministry of Energy and Mines which oversees the developer. It will be important that these

<table>
<tr><td></td><td>parties will agree on a realistic work plan with the implementation, funding, and reporting arrangements. The membership of the expert group needs to be balanced and professional, and led by an independent expert/team leader.

The second objective depends on the willingness of local and national agencies in both countries to cooperate and share data and information, but also on the technical and diplomatic skills and experience of the service provider that will be contracted (see above). It will be important that the selected provider can demonstrate considerable experience in shared vision planning, use of remote sensing data, economic and social development planning, and spatial planning, in addition to water and related resources planning.</td></tr>
<tr><td>Work plan</td><td>The work plan for Component 1 comprises the following main elements:

<table>
<tr><th>Activity</th><th>Tentative timeline</th></tr>
<tr><td>1) Promotion of the project for funding and implementation (role of MRCS and NMCSs)</td><td>2016/2017</td></tr>
<tr><td>2) Set up the implementation arrangements for the environmental impact monitoring with the Don Sahong HPP developer</td><td>Mar-Jun 2017</td></tr>
<tr><td>3) Preparation of detailed work plan and distribution of responsibilities for implementation and funding (MRC, expert group, developer)</td><td>Jul-Dec 2017</td></tr>
<tr><td>4) Implement the work plan and regularly publish the collected data, the results of the analysis, and the recommendations for mitigation and adaptive management measures on a dedicated webpage. This includes the effectiveness monitoring of mitigation and adaptive management measures</td><td>2018-2025 (note that part of the monitoring programme is already ongoing)</td></tr>
<tr><td>5) Implementation of mitigation and adaptive management measures by the developer</td><td>Ongoing and continuous</td></tr>
<tr><td>6) Organize, implement and report on annual stakeholder meetings to discuss progress, results, and implications</td><td>Annually</td></tr>
</table>

The work plan for Component 2 comprises the following main elements

<table>
<tr><th>Activity</th><th>Timing</th></tr>
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</td></tr>
</table>

	1) Promotion of the project for funding and implementation (role of MRCS and NMCSs)	2016/2017
	2) Set up and operationalization of implementation arrangements in the Southern Laos and the Cambodian Upper Mekong area, including, procurement, contracting and mobilization of the service provider	Mar-Dec 2017
	3) Inventory, reviews and SWOT analysis (see activities under Component 2)	2018
	4) Scenario based, shared vision planning and development of a long-term socio-economic vision and associated spatial plan for the Khone Falls area within the wider context of Southern Lao PDR and the Cambodian Upper Mekong area	2018/2019
	5) Identification of possible no-regret, short term water related measures, as well medium term and longer term measures (structural, non-structural)	2019
	6) Preparation of short-term measures up to pre-feasibility level	2020
	7) Preparation of joint action plan, national implementation arrangements, and coordination mechanisms	2021
	The work plan for Component 3 will be determined based on the joint action plan	
Costs and financing	The estimated costs for Component 1 are:	
	Activity	**Estimated costs (US$)**
	1) Promotion of the project for funding and implementation (role of MRCS and NMCSs)	In kind
	2) Set up the implementation arrangements for the environmental impact monitoring with the Don Sahong HPP developer	10,000
	3) Joint preparation of detailed work plan and distribution of responsibilities for implementation and funding (MRC, expert group, developer)	40,000
	4) Implement work plan and regularly publish the collected data, the results of the analysis, and the recommendations for mitigation and adaptive management	80,000 per year (in addition to ongoing

	measures on a dedicated webpage. This includes the impact monitoring of mitigation and adaptive management measures	monitoring by developer, MRC etc.
	5) Implementation of the mitigation and adaptive management measures by the developer	For the developer
	8) Organize, implement and report on annual stakeholder meeting to discuss progress, results, and implications	20,000/year
	Total (excluding the initial cost in 2017)	**100,000/year**

The estimated costs for Component 2 are:

Activity	**Estimated costs (US$)**
1) Promotion of the project for funding and implementation (role of MRCS and NMCSs)	In kind
2) Set up and operationalization of implementation arrangements in the Khone Falls area, including, procurement, contracting and mobilization of the service provider	100,000
3) Inventory, reviews and SWOT analysis (see component description)	200,000
4) Scenario based, shared vision planning and formulation of a long-term socio-economic vision and associated spatial plan for the Khone Falls area	300,000
5) Identification of possible no-regret, short term water related measures, as well medium term and longer term measures (structural, non-structural)	200,000
6) Preparation of short-term measures up to pre-feasibility level	600,000
7) Preparation of joint action plan, national implementation arrangements, and coordination mechanisms	100,000
Total	**1,500,000**

The costs of Component 3 will be based on the joint action plan.

M&E	Implementation progress will be measured against the time line in the work plans for Component 1 and 2. Impact monitoring will track whether the objectives have been achieved. Impact Indicators could include:

	• The agreed minimum flows over the Phabeng Falls are being maintained; • Fish passage through the Hou Xang Pheuak and Hou Sadam effectively replaces the lost fish passage through the Don Sahong; • Local Government agencies and key stakeholders are actively engaged in the shared vision planning process for the Khone Falls area; • The developed long-term socio-economic vision and associated spatial plan for the Khone Falls area is agreed by the two border provinces; • The identified short-term measures (investment projects and activities) are integrated into the provincial planning in Lao PDR and Cambodia.
Next steps	The promotion of the project for funding and implementation (role of MRCS and NMCSs) is ongoing and can be completed in March 2017.

Annex 3: JPIN Transboundary cooperation for flood and drought management in Thai-Cambodian border area – a part of 9C-9T Sub-area (Thailand, Cambodia)

Joint Project Information Note

Project title	**Transboundary cooperation for flood and drought management in Thai-Cambodian border area – a part of 9C-9T Sub-area**
Countries	**Cambodia and Thailand**
Issues	The project area covers a shared river sub-basin between Thailand and Cambodia. It is located within the 9C-9T Sub-area and covers a total area of 14,952 km^2. The sub-basin in Thailand, namely Tonle Sap sub-basin or 9T sub-basin, constitutes about 27.3% of the total project area (4,086 km2), is situated in the upstream portion of the sub-basin and covers parts of the Sa Kaeo and Chanburi provinces. The downstream sub-basin in Cambodia namely Stung Mongkul Borey sub-basin, covers the major part of the project area (10,866 km2) and the entire Banteay Meanchey Province, as well as parts of Battambang and Pailin Provinces. The total population of the river basin (project area) is about 1.4 million (0.35 million in the 9T sub-basin and 1.05 million in the Stung Mongkol Borey sub-basin (CNMC, 2012). By nature, several streams in the river basin flow from the upstream 9T sub-basin in Thailand across the Thai-Cambodian border through Sisophon and Svay Chek rivers into the Stung Mongkol Borey sub-basin, which stretches 100 km downstream from the border. The transboundary flow is not anymore in its natural state. But, in the real situation the flow from upstream is disrupted at the border area from flowing to downstream river in Cambodia. **The 9T sub-basin** has an average annual surface water volume of about 1,794 million cubic meters (MCM). At present, less than 10% of the volume is kept and used for agricultural and other development purposes in the 9T sub-basin. Due to limited water infrastructure, rainfall in the rainy season bring about floods, causing damages to lives and properties every year. On the other hand, the sub-basin experiences occasional droughts in the dry season due to the small capacity of the existing reservoirs or irrigation schemes. Efforts have been made by the Thai Government agencies to identify and develop effective measures to mitigate the problems. Several stations to monitor rainfall and river flow in upstream areas have already been installed. In addition, a flood warning system has been established and new reservoirs are being constructed. Meanwhile, Sa Kaeo Province (Thailand) has recently been selected as a new “Special Economic Zone (SEZ)” of the country. Land and water resources are being developed to meet new demands for water for both agriculture and domestic consumption, particularly in the central part (Huai Phrom-hod) of the 9T sub-basin. In addition to the measures for mitigating flood and drought problems, new irrigation schemes are being planned.

	<u>The Stung Mongkol Borey sub-basin</u> has a mean annual flow of 568 MCM, which is the net river flow within the Cambodian territory. The water level records at Stung Mongkol Borey and Sisophon Rivers in respective stations are available from 1997. The annual rainfall in the sub-basin ranges between 1,000 and 1,200 mm (CNMC,2012). Large (flash) floods occurred in this sub-basin in 2012 and 2013. In the 2012 event, 3 lives were lost and 1,600 families across 14 villages in Banteay Meanchey were evacuated. In 2013, 18,880 ha of rice paddies and 34 roads were damaged and 100 homes flooded. Also this sub-basin experiences drought problems regularly during the dry season when the rainfall availability is only around 90 mm (MOWRAM, 2014). Earlier, an analysis made by the Flood Management and Mitigation Prorgamme (FMMP) of the MRC revealed that the cause of the 2012 flooding in the Stung Mongkol Borey sub-basin was excessive rainfall in Banteay Meanchey Province. For the 2013 flooding, however, overland and river-flow from Thailand were seen as a major cause. The flood waters were said to have entered Cambodia at O Beychoan, O Chreuo, Svay Chek, Malai and Pailin. In order to prevent and mitigate such large floods in the future, it was recommended to improve drainage and set-up flood warning systems in close collaboration between upstream and downstream stakeholders. In addition, due to severe impacts of the recent floods in Banteay Meanchey Province, MOWRAM developed the Strategic Plan for Flash Flood Mitigation (MOWRAM, 2013), which includes structural and non-structural measures, including the improvement of hydro-meteorological data collection systems, the transboundary sharing of the collected data, construction of flood draining connections at O Baychoan and O Chreuo in the border area, and the transboundary sharing of river water during drought periods. Priority actions already taken include the installation of three meteorological stations and investments in flash flood management and irrigation development. Due to the geographical (upstream-downstream) relationships between the 9T and the Stung Mongkol Borey sub-basins, a transboundary IWRM process is deemed necessary to ensure coordinated flood and drought management and development activities in the project area, and adequate exchanges of information among the parties concerned. Past experiences demonstrated that uncoordinated development actions in the upstream and downstream sub-basins will not effectively solve the recurrent flood and the drought problems in both sub-basins. Accordingly, the two countries are seeking a concrete cooperation framework that would enable them to work jointly in mitigating the flood and drought problems effectively and efficiently in a sustainable manner. As a starting point, a joint assessment in the project area will be carried out to serve as a solid basis for identifying projects/activities that can be implemented, either jointly or unilaterally in the coming years.

Objectives	The ultimate objectives are: 1) To increase the capacity for transboundary integrated water resources planning and forecasting of floods and droughts and associated information services, including early warning of risks; 2) To improve water security, including measures against floods and droughts, to support the economic and social development in the project area. **Immediate objective** of the joint project is to operationalize a joint assessment and planning process to deliver a coherent and consistent package of national projects and activities that can be implemented in a coordinated and timely manner to meet the immediate needs for flood and drought mitigation measures in the Thai and Cambodian parts of the shared river basin (project area).
Project Components	There are four possible components in this joint project, i.e., a joint assessment and planning component, a coordinated implementation component in Thailand and Cambodia, and an implementation support component. **1) Joint assessment and planning.** Although some general surveys have been conducted in both countries at the sub-basin level, flood and drought related problems and possible solutions and measures at the transboundary level are not readily known or identified. The proposed joint assessment and planning is required to develop a longer term strategy and identify structural and non-structural solutions and measures that are effective at the river basin level and sustainable and robust in the face of possible future developments, climate change and other uncertainties. The joint activities will include: a) Review and update the current situation and trends in the project area, based on secondary information and field work; b) Study the flood and drought related problems at the transboundary level, particularly transboundary flash floods; c) Review of the current socio-economic, spatial and sectoral plans for the sub-basins; d) Assess the future water related needs and the likely future issues and opportunities in the project area; e) Prepare a hydrological model of the shared sub-basin (based on the DSF models of the MRC) and calibrate and test it using the available historical hydrological data and readily available remote sensing data. Identify knowledge gaps; f) Back-cast the flood events in 2012 and 2013 and assess exploratory scenarios to test possible structural mitigation measures for the observed (flash) floods and droughts, such as flood dykes, construction of reservoirs, stream and drainage improvements, and the restoration of degraded watersheds. Test the possible solutions from the basin-wide (project area) perspective by taking into account climate

	change, as well as synergies and trade-offs with potential future beneficial water uses, such as the increase of public and industrial water supply and the extension and improvement of irrigation in both upstream and downstream portions of the shared sub-basin; g) Assess the effectiveness of possible non-structural solutions for the historically observed and anticipated future flood and drought problems, considering the entire river basin (project area) and taking into account complementarities with possible structural solutions. Non-structural solutions could include improvement of hydro-meteorological networks and flood and drought forecasting systems and the associated information and early warning services, operational alarm systems in communities threatened by flash floods, changes in the socio-economic and spatial plans, watershed management including land conservation and reforestation, and the related institutional and human capacity development; h) Conduct a pre-feasibility assessment of promising near-term structural and non-structural projects for flood and drought management, as well as for further beneficial water uses, such as the extension and improvement of irrigation areas and the improvement of public and industrial water supply; i) Pull everything together in a joint strategy with an implementation/action plan that provides a coherent and consistent package of short and longer-term structural and non-structural projects and supporting activities in the Thai and Cambodian portions of the project area, including capacity building and extensive stakeholder engagement. The action plan will provide also the implementation arrangements, including the proposed implementation responsibilities of the various Government agencies and others. As part of the expected outputs, such projects and activities as data collection and sharing, development of flood and drought forecasting capacity, establishment of early warning services, installation of operational alarm systems in high-risk communities, no-regret infrastructure solutions to mitigate future floods and droughts, and investments for beneficial water uses could be recommended. All the recommended measures should contribute to the increase in water security, thus enabling socio-economic development in the shared sub-basin as well. It is anticipated that most of the joint action plan can be implemented through coordinated national planning and implementation in Cambodia and Thailand. In this connection, there may be scope for joint projects and activities that are implemented on a basis of cost and benefit sharing. **2) Implementation of joint action plan - Thai project area**. As an output of Component 1, a set of national projects and activities that can be implemented unilaterally by Thailand is expected. These projects/activities would be implemented by the responsible Thai agencies, as a part of their respective sector or annual work

	plans. Whenever needed, coordination meetings with the relevant Cambodian agencies will be conducted. Coordination with Cambodia would be needed to ensure that non-structural projects, such as the hydro-meteorological flood forecasting systems and associated information services, are compatible throughout the project area. Coordination may be also needed to ensure that possible structural water security projects in the Thai and Cambodian parts of the project area are aligned with the basin-wide strategy (output from Component 1) in order to provide basin-wide water security benefits. However, the preparation and implementation of any identified joint projects and activities in the joint action plan (see above) will require higher levels of collaboration with Cambodia. In this case, a Memorandum of Understanding or a specific agreement between the implementation agencies involved in both countries should be put in place to ensure continued coordination and timely mobilization of resources for the subsequent implementation to follow. Potential projects/activities may include: a) Extension and/or upgrading of the hydro-meteorological networks in the project area, with real time weather, water level and flow monitoring; b) Improvement of data and information sharing with Cambodia through the existing databases and communication systems of MONRE; c) Development of flood forecasting and flash flood guidance in the project area; d) Improvement of information services, including early warning; e) Other structural and non-structural projects/activities identified in the joint action plan, such as, watershed improvement projects, reforestation, extension and improvement of irrigated agriculture, floods and droughts mitigation projects, etc., that could help to increase water security and generate benefits. **3) Implementation of joint action plan – Cambodian project area**. Similar to the Thai project area, it is anticipated that most of projects and activities in the Cambodian part of the project area can be implemented by the responsible Cambodian agencies as a part of their respective sector or annual work plans. Whenever needed, coordination meetings with the relevant Thai agencies will be conducted to ensure that (i) the hydro-meteorological flood forecasting systems and associated information services are compatible throughout the project area and (ii) structural water security projects in the Thai and Cambodian parts of the project area are aligned with the basin wide strategy, in order to provide basin-wide water security benefits. However, the preparation and implementation of any identified joint projects and activities will require higher levels of collaboration with Thailand. These may include river stream and drainage improvements in the border area and the development

	and operation of a flood and drought forecasting and early warning system. The preparation of such projects may require a Memorandum of Understanding or a specific agreement between the implementation agencies involved in both countries to ensure continued coordination and timely mobilization of resources for the subsequent implementation to follow. Potential projects and activities may include: a) Extension and upgrading of the hydro-meteorological network in the Stung Mongkol Borey sub-basin, with real time weather and water level and flow monitoring. The observed data (as well as the GIS data of the sub-basin) could be collected and shared with Thailand through the existing databases and communication systems of MOWRAM until the proposed hydro-informatics center has been established in the Stung Mongkol Borey sub-basin (MOWRAM has plans to establish such centers in the main river basins of Cambodia); b) Development of flood forecasting in the Stung Mongkol Borey sub-basin. Currently, the Cambodian flood forecasting system only supports emergency response in the Mekong/Tonle Sap floodplains but not in the tributaries that are subject to (flash) flooding. In collaboration with Thailand, the MRC flash flood guidance system could be further improved in the project area and the Thai concept of early warning and preparedness could perhaps be replicated in the Stung Mongkol Borey sub-basin. Operational alarm systems could be installed in the communities that are most threatened by flash floods. In the longer-term, the Stung Mongkol Borey Hydro-Informatics Center should be able to make flood and drought predictions and provide early warning, based on the utilization of a (nationally established) Decision Support System (see under (d) below); c) The preparation and subsequent implementation of other structural and non-structural projects and activities identified in the joint action plan, which could include stream and drainage improvements, restoration of deteriorated watersheds, land conservation and reforestation, construction of (multi-purpose) reservoirs and constructed wetlands, extension and improvement of irrigated agriculture, and activities projects that adapt socio-economic, spatial and sector plans for the sub-basin to increase water security and generate benefits. d) Supporting the development of hydro-informatics services, possibly in the form of a national hydro-informatics center that is comparable with those in Thailand (HAII) and Viet Nam. The hydro-informatics center would function as a repository of water-related data and conduct weather forecasting, flood and drought forecasting, and short-term and longer term water resources planning throughout the territory of Cambodia for Government agencies and others. Its main tools would be a contemporary and functional Decision Support System (DSS) that comprises a modular, interconnected system of databases, surface and groundwater models, analysis and

	reporting tools, and a web interface, which can be operated through a user platform. **4) Support to implementation of joint action plan**. This component will support the occasional coordination meetings between the responsible Thai and Cambodian agencies to: (i) discuss progress and exchange knowledge and experiences for joint learning and (ii) ensure that the hydro-meteorological flood forecasting systems and associated information services are compatible throughout the project area, and the development of water security projects in the Thai and Cambodian parts of the project area are aligned with the basin-wide strategy in order to provide basin-wide water security benefits. Implementation support may also be needed for the preparation and implementation of possible joint projects (possibly with cost and benefit sharing) on the basis of a MoU or specific agreement.
Relevance, Importance, linkages	The water policy and plans of both countries aim at ensuring that all citizens receive early warnings of droughts, floods and storms by providing nation-wide hydro-meteorological monitoring, flood and drought forecasting and warning in areas at risk. Due to severe impacts of the recent flooding incidents in transboundary sub-basins within the shared sub-basin, Government agencies from Thailand and Cambodia met and agreed to cooperate to solve the flood and drought incidents (see under “Issues”). For MRC, which has been engaged in these issues through Sub-area planning and case studies, this joint project offers the opportunity to support and facilitate transboundary water resources management at the local scale by local agencies and based on the knowledge and aspirations of the people in the sub-basins. The above water security issues need to be addressed in tandem with new water security demands related to socio-economic development. In the Thai portion of the shared sub-basin, a “Special Economic Zone (SEZ)” of the country is planned and land and water resources are being developed to meet new demands. Also in the Cambodian portion of the shared sub-basin, various relevant activities are on-going or being planned. KOIKA has offered assistance and funding for flood protection and irrigation development in Banteay Meanchey Province. The joint project supports the enabling environment for developing further water resources in the transboundary sub-basins, in line with Development Opportunity 4 of MRC’s Basin Development Strategy. The joint project also addresses BDS Strategic Priority 2 (Optimize basin-wide sustainable development and benefit sharing), Priority 6 (Enhance information management, communication and tools), and Priority 7 (Increase cooperation with partners and stakeholders). And the project implements Activity 2.2.2 of the MRC Strategic Plan 2016-2020: Prepare strategies for flood management in the Cambodia and Viet Nam Mekong delta (flood plain) and for the Thai-Cambodian border area.

	Finally, the joint project addresses several Sustainable Development Goals, including: • SDG 1 on poverty reduction, in particular Indicator 1.5 (disaster risk reduction); • SDG 6 on water, in particular Indicator 6.4 (water use efficiency and scarcity), Indicator 6.5 (IWRM and transboundary management), and Indicator 6.a (international cooperation and management); and • SDC 13 on combatting climate change, in particular Indicator 13.1 (resilience and adaptive capacity to natural disasters) and Indicator 13.2 (integration of CC measures in national policies, strategies and plans).
Implementation arrangements	MRC/MRCS will be the executing agency for the joint assessment and planning component (Component 1) with MOWRAM (Cambodia) and MONRE (Thailand) as the key implementing agencies. Important cooperating agencies in Thailand include the Royal Irrigation Department (RID), the Land Development Department (LDD), the 9T (Tonle Sap sub-basin) River Basin Committee, and others. Important cooperating agencies in Cambodia include the Ministry of Environment (MOE), the Ministry of Agriculture, Forestry and Fisheries (MAFF), the Tonle Sap Authority (TSA), the Ministry of Rural Development (MRD), The Ministry of Tourism (MOT) and Local Authorities from Battambang, Banteay Meanchey and Pailin Provinces. The funding required for the implementation of Component 1 is expected from development partners. A steering committee comprising of members from the implementing agencies and selected cooperating agencies from countries (upon recommendation) could be established to provide guidance to the MRC/MRCS, solve constraints and problems which cannot be solved in another manner, and create consistency and synergies that can enhance the value of the basin's water resources and/or capture the benefits of transboundary cooperation. If funding has been found, implementation support for the joint assessment and planning component could be outsourced to an appropriate party, which could be a consulting company or similar. Depending on the rules of the supporting development partner, this service provider would be selected by the MRCS in consultation with National Mekong Committees (NMCs) in Cambodia and Thailand. The service provider would work with the local Government agencies and key stakeholders in the project area and report to the executing agency which informs the NMCs, the implementing agencies, the development partner and other key stakeholders, depending on arrangements being agreed among the parties. **Component 2**. Following the completion of the joint assessment and planning component, the recommended national and joint projects/activities in the joint action plan will be implemented by

	responsible agencies in Thailand, including particularly the Royal Irrigation Department (RID) and the Department of Water Resources (MONRE), with their own resources. The implementation of the joint projects/activities will be based on a MoU or specific agreement as described earlier. **Component 3** will be implemented by MOWRAM and other responsible agencies in Cambodia, if needed, with support from a consulting company or similar service provider. The development of the national hydro-informatics center with the DSS for flood forecasting and planning in the country's river basins would be implemented as a major stand-alone project supported by a development partner. **Component 4** will be implemented under similar arrangements as Component 1.
Impacts	The impacts of this joint project are mostly positive. The project will ultimately increase the capacity to forecast flood and droughts in the shared sub-basin and provide early warning services, including operational alarm systems in communities threatened by flash floods, which will save lives and reduce damages. The increased security against flood and droughts and the strengthened water management capacity will attract and enable investments for the further development of beneficial water uses that is being planned in the upstream and downstream parts of the shared sub-basin. There may be significant synergies between the type and operations of interventions needed for the improvement of flood and drought security and those that are needed for addressing the new demands for beneficial water use in the various parts of the shared sub-basin. The identification of these interventions in a sub-basin-wide context increases the benefits and reduces the costs and adverse impacts, which will be assessed during the joint assessment and planning and during the subsequent preparation of the selected projects. The joint project will promote regional integration by joint assessments and planning, data and information exchange, joint flood forecasting, collaboration for infrastructure improvement in the border area, and the coordination of the operation of new water infrastructure.
Risks and challenges	The risks and challenges are mainly related to the implementation arrangements and less to technical solutions and measures that are well known and already applied in the region. With respect to the joint assessment and planning (Component 1), the risk is that the agencies involved in both countries cannot agree on a common terms of reference for a team of planners and experts that would work as one "project" team at both sides of the border. One option is that a consulting company (or similar) will be engaged for the implementation of Component 1. The consulting company would work with all the national and local agencies and stakeholders concerned and report to the MRC/MRCS (executing

<table>
<tr><td></td><td>agency), which inform the members of the established steering committee and other stakeholders to be agreed upon.

Another risk is that the two countries cannot reach a negotiated agreement on some projects and activities in the joint action plan as their benefits are for a substantial part realized in the other country. In this case, the distribution of the benefits and costs of the entire joint action plan could be brought to the negotiation table, as well as indirect benefits beyond the water sector.

After completion of Component 1, the implementation of the “national” components (Component 2 and 3) is more straightforward although the implementation in Cambodia would depend on how its tools and capacity for forecasting and early warning at the national level and river basin level will be implemented, which would require considerable funding and technical assistance.

The risks related to Component 4 (Support to implementation of joint action plan) are limited as long as the agencies involved in the two countries are willing to share data and information and meet annually to share progress and experiences, if needed with facilitation and coordination support by the MRC/MRCS.</td></tr>
<tr><td>Work plan</td><td>The work plan for Component 1 (Joint assessment and planning) comprises the following main elements:

<table>
<tr><th>Activity</th><th>Tentative timeline</th></tr>
<tr><td>1) Promotion of the project for funding and implementation (role of MRCS and NMCSs)</td><td>Ongoing – Mar 2017</td></tr>
<tr><td>2) Set up of the implementation arrangements, including Government agencies, preparation of TOR and procurement of consulting company (or similar), and stakeholder platform</td><td>Apr-Dec 2017</td></tr>
<tr><td>3) Inventories, reviews and assessments of future needs (see description of Component 1)</td><td>Jan-Jun 2018</td></tr>
<tr><td>4) Development and calibration of the hydrological model (based on the MRC DSF) and identification of knowledge gaps</td><td>Jul-Nov 2018</td></tr>
<tr><td>5) Assessment of exploratory scenarios to identify and phase structural and non-structural measures for flood and drought problems within the broader context of further basin development and climate change</td><td>Dec 2018- Apr 2019</td></tr>
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</table>

	6) Conduct a pre-feasibility levels assessment of priority projects (structural and non-structural)	May-Dec 2019
	7) Preparation and operationalization of the joint action plan, including a draft of the MOU or specific agreement to be concluded by the implementing agencies from the two countries	Jan-Jun 2020

The preparation and implementation of the non-structural and structural projects and activities under Component 2, 3 and 4 would be guided by the results of the assessments and planning under Component 1.

Costs and financing

The estimated costs for Component 1 are:

Activity	**Estimated costs (US$)**
1) Promotion of the project for funding and implementation (role of MRCS and NMCSs)	In kind
2) Set up and operationalization of the implementation arrangements, including Government agencies, preparation of TOR and procurement of consulting company (or similar), and stakeholder platform	40,000
3) Inventories, reviews and assessments of future needs (see description of Component 1)	60,000
4) Development and calibration of hydrological model and identification of knowledge gaps	200,000
5) Assessment of exploratory scenarios to identify and phase structural and non-structural solutions and measures for flood and drought problems within the broader context of further sub-basin development and climate change	300,000
6) Conduct pre-feasibility level assessment of priority projects (structural and non-structural)	400,000
7) Preparation and operationalization of the joint action plan	200,000
Total	**1,200,000**

The cost estimate for the preparation and implementation of the non-structural and structural projects and activities under

	Component 2, 3 and 4 will be based on the results of the assessments and planning under Component 1.
M&E	Implementation progress will be measured against the time line in the above work plan and subsequently developed work plans for each component. Progress indicators will be developed jointly. Impact monitoring will track whether the objectives have been achieved. Indicators could include: • National and local Government agencies and key stakeholders in the shared river basin are leading the joint assessment and planning process and the subsequent implementation of the structural and non-structural projects and activities; • The identified structural and non-structural projects and activities are incorporated in the relevant socio-economic, spatial and sector plans; • The hydro-meteorological and forecasting and early warning systems in the Thai and Cambodian sub-basins are compatible and are working in tandem to reduce the risks of flood and droughts.
Next steps	The promotion of the project for funding and implementation (role of MRCS and NMCSs) is ongoing and could be completed by March 2017.

Annex 4: JPIN Sustainable water resources development and management in the Sekong, Sesan and Srepok river basins (3S Basin) (Lao PDR, Cambodia and Viet Nam)

Joint Project Information Note

Project title	**Sustainable water resources development and management in the Sekong, Sesan and Srepok river basins (3S Basin)**
Countries	**Lao PDR, Cambodia and Viet Nam**
Issues and opportunities	The Sekong-Sesan-Srepok tributary basins are the only large transboundary tributaries in the Mekong Basin. Together the three river basins are referred to as the 3S Basin, which has a joint confluence with the Mekong mainstream at Stung Treng province in Cambodia. The total area of the 3S Basin is 78,650 km2, corresponding to about 10% of the area of the entire Mekong Basin. The runoff of the 3S Basin generates about 20% of the Mekong flow and 10-20% of the sediments in the Mekong mainstream. Large-scale water resources development started in the 1990s in the rapidly developing upstream portion of the Sesan-Srepok basins (2S Basin) in the **Central Highlands of Viet Nam**, which led to the development of 15 hydropower plants and about 70,000 ha of irrigated agriculture. The population grew to 3 million people. Currently, Viet Nam has largely completed its water related development plans in the Central Highlands. The focus has shifted to water resources management with the establishment of the Srepok Council (2005), the recently initiated establishment of the Sesan-Srepok RBO, and the development of a comprehensive water resources knowledge base and planning tools, and the development of a coordination mechanisms with downstream Cambodia, which has experienced unusual flood, drought and water pollution events in the past that were attributed to upstream development. More recently, large scale water resources development commenced in the less developed and populated **Laotian and Cambodian** portions of the 3S Basin. About 270,000 people inhabit each of the Lao and Cambodian parts. Many of the Lao and Cambodian people still live close to the river system and remain dependent on natural resources, including fish. Cambodia is developing the Lower Sesan 2 hydropower project just downstream of the confluence of the Sesan and Srepok, which may affect fish migration from the Mekong into the 2S Basin (depending on the effectiveness of the constructed fish passages). Lao PDR has developed 3 of the 23 planned hydropower projects on tributaries in the upstream portion of the Sekong Basin, which is the only major free flowing river left in the Mekong Basin. However, Lao PDR and Cambodia are also planning dams on the mainstream of the Sekong. Viet Nam has been strongly involved in hydropower and agricultural development in Sekong Basin in Lao PDR. Since 2000, the 3S Basin has received substantial international assistance for studies in this basin, including the ADB/MRC 3S study and the ongoing WB supported Mekong IWRM Program that supports transboundary dialogues and the improvement of hydro-

	meteorological and data management systems. However, a joint assessment by the three 3S Basin countries of the impacts of existing and planned development, and the identification of opportunities for achieving greater benefits through cooperation is long overdue. Recent issue assessments in the transboundary 3S Basin by the Mekong IWRM Program and in a paper by IUCN include the following priority needs: • **Further Improvement of monitoring of water and related resources**. Cooperation on the collection and sharing of data (water flow, water quality, sediments, and a few other parameters) will build a common understanding of the situation and trends in the 3S Basin, including transboundary issues, and the basis for the planning of water resources development and operations; • **Improvement of flood and drought forecasting and early warning, and disaster preparedness**. Although clearly a transboundary issue, flood forecasting and early warning in each of the three river basins are mainly dealt with at the national level or not at all; • **Improvement of operational water resources management**. This includes the development and sharing of seasonal of basin operational plans, the allocation of scarce water in the dry season, and coordination of the operation among cascading hydropower plants for sediment and flow management; • **Improvement of the existing basin development plans.** A Cooperative Regional Assessment (CRA) by the three 3S Basin countries of the impacts of existing and planned development, and the identification of opportunities for achieving greater benefits through cooperation is long overdue; • **Capacity building for the planning and implementation of the above priorities**, in particular in Lao PDR and Cambodia. Parts of the above needs are being addressed by programmes and projects supported by development partners, such as the Mekong IWRM Program and the GMS regional investment framework.
Objectives	There are two objectives: 1) To strengthen coordinated national planning of the development and management of water and related resources in the 3S Basin to: (i) improve socio-economic development in the riparian countries, (ii) minimize negative transboundary impacts, and (iii) ensure water security (including against future floods and droughts) in an equitable manner through cooperation between the 3S Basin countries. The **outcome** is: “decision-making in water resources planning is based on scientific assessment of the impacts caused by

	water resources development and management and the mutual benefit of 3S people". 2) To develop the capacity of the relevant water resources management agencies (MONRE, MOWRAM and MONRE) and relevant provincial agencies and the NMCs of the 3S Basin countries to manage transboundary water resources and climate risks. The outcome is "an operational network of qualified and active experts of stakeholders (line agencies, Provinces, RBOs and NMCSs) that effectively supports and facilitates the established transboundary coordination mechanisms to address transboundary water resources issues and opportunities".
Project Components	There are three components in this joint project: Cooperative Regional Assessment (CRA) in support of development planning in the 3S Basin, and components that focus on the improvement of transboundary management and cooperation in the Sekong Basin (between Lao PDR and Cambodia) and in the Sesan-Srepok Basin (between Viet Nam and Cambodia), as follows: **1) Cooperative Regional Assessment for development and management of the 3S Basin**. This component will strengthen coordinated planning and management of water resources in the 3S Basin in the face of future uncertainties including climate change, with a view to increasing national socio-economic benefits, minimizing negative transboundary impacts, and providing water-related security (food, energy, environment, flood and droughts) in an equitable manner through cooperation between the 3S basin countries. The CRA is the logical successor of recent donor supported activities in the basin and complements ongoing initiatives of the WB, USAID, and others. The CRA is linked to overall Mekong Basin planning through fish migration and water and sediment supply to the Mekong mainstream. The CRA is a multi-sectoral assessment that considers the positive and negative inter-dependencies of sectoral development in the different parts of an international river basin (hydropower, irrigation, flood and drought management, environment, climate change etc.) to achieve more optimal and sustainable outcomes compared to national planning. The assessment will be based on mutually agreed sustainable development objectives and supporting indicators. Although the scope of the CRA is for the entire 3S basin, the assessment and its results can be discussed separately for the Sekong basin (shared by Lao PDR and Cambodia) and the Sesan-Srepok basin (shared by Viet Nam and Cambodia). The CRA will be used to build further trust and confidence among the countries and set the stage for discussing synergies and trade-offs of development plans, and considering joint (investment) projects that provide incremental benefits that can be shared. It is expected that joint projects and cost and benefit sharing options could provide more benefits to each country and significantly reduce environmental impacts in the downstream Cambodian

	portion of the 3S Basin and further downstream in the Mekong Delta. The output is defined as: “CRA results are agreed upon by the 3S Basin countries and disseminated to stakeholders”. The activities will include: a) Establish the implementation arrangements, including a stakeholder engagement programme; b) Assess the current socio-economic and water-related situation and trends; review the national socio-economic, spatial and sector plans; review the regional plans, including the GMS regional investment framework; and make an inventory of the ongoing projects and activities; c) Formulate and discuss with the stakeholders in the three 3S Basin countries a few different but credible long-term socio-economic development scenarios for the 3S Basin, which could result in a commonly shared and supported strategic long-term basin vision or sustainable development objectives and supporting economic, social and environmental indicators (for the 3S Basin as a whole and/or different parts of the 3S Basin); d) Improve and validate MRC’s DSF (which is a DSS) for use in the 3S Basin and assess the cumulative impact of the existing, ongoing and currently planned water resources development and a few alternative development plans against the earlier agreed indicators that are sensitive to water resources development and relevant to the agreed long-term vision/development objectives, while taking into account the possible impacts of climate change. The alternative plans will likely include joint investments projects to increase mutual benefits and reduce costs and adverse impacts); e) Present the resulting distribution of the benefits, costs, impacts and risks of each of the existing and alternative development plans for the 3S Basin as a whole and for each of three countries in a form that is understandable for the various stakeholder. Compare and identify acceptable plans or parts of plans that create high benefits, acceptable negative impacts, and provide water-related security in an equitable manner. The comparison of the plans will also require the consideration of complementary measures that may be needed to offset or mitigate the impacts of acceptable development, as well as supporting policies, strategies, guidance, institutional mechanisms, and research; f) Elaborate the implications for national planning and demonstrate the benefits of adaptation of national plans and provide guidance for the updating of socio-economic, spatial and sectoral plans of thn three countries in the 3S Basin; g) Elaborate the implications for cooperation of the 3S Basin countries (facilitated by the MRC), including the implementation of joint and/or coordinated investment projects,

	and the improvement of the effectiveness of the MRC procedures and guidelines for the management of the 3S Basin; h) Throughout the implementation of the above activities, develop the capacity of the water resources management agencies, relevant sector agencies and provincial agencies, and the NMCSs to manage transboundary water resources and climate risks. **2) Transboundary water resources management in the 2S Basin** (Srepok and Sesan Basins, shared by Viet Nam and Cambodia)**.** This component focusses on the improvement of transboundary management and cooperation in the Sesan-Srepok Basin by Viet Nam and Cambodia, including addressing the issues and opportunities described earlier, as well as the relevant results from the CRA. The output is: "Compatible standards and systems for water-related monitoring and hydrological forecasting and associated coordination mechanism and information services to support sustainable investment and management in 2S Basin". The activities will include but not limited to: a) Formulate the framework, elements and programs for structured stakeholder consultations in conjunction to the following activities; b) Further Improve the hydro-meteorological system for monitoring of weather and hydrological parameters for basin development, such as precipitation, water flow and water quality data and the sharing of these data, in order to support water resources development and management planning, and flood and drought forecasting. This is being addressed in the Viet Nam and Cambodian portions of the 2S Basin with support by the aforementioned Mekong IWRM Program, but much more can be done, particularly in Cambodia; c) Improve flood and drought forecasting and associated services such as early warning and disaster preparedness. In the Viet Nam portion of the 2S Basin where significant water allocation and operational management issues exists, a state of the art Decision Support System (DSS) will be developed with support from the Mekong IWRM Program. The DSS will support water management across time scales for online monitoring and communications, weather prediction, drought forecasting and planning, flood forecasting and early warning, reservoir operations, water allocation, seasonal forecasting, drought management, reservoir sedimentation management and longer-term planning of infrastructure development, and climate change adaptation. The DSS will be managed by the appropriate agencies/2S Viet Nam RBO is being established. In the less developed Cambodian portion of the 2S Basin, with few operational water management issues, a DSS is not yet in the planning. The current Cambodian flood forecasting system supports emergency response in the Mekong/Tonle Sap

	floodplains but not in the tributaries. This sub-component will explore how forecasting services can be extended/developed to cover the entire 2S Basin; d) Establishment and support of a coordination mechanism between Viet Nam and Cambodia on the 2S basin (building on the results of the ongoing Mekong IWRM Program), including linking hydrological networks, basin models, real-time weather and hydrological forecasting, and reservoir operation guidelines and emergency response procedures. It can be argued that Cambodia needs to develop at the national level a Decision Support System and management capacity that is compatible with those that exist or being developed in Thailand (National Hydroinformatics and Climate Data Center managed by HAII), in the Viet Nam Delta (managed by the Delta Center that is being established), and in the Viet Nam 2S Basin (managed by the appropriate agencies/2S RBO), in order to be able to plan and manage its mostly transboundary water resources on a level playing field with the neighbouring countries, including in the 2S Basin. This would be a national project in its own right that would result in a DSS and capacity that can be used to deliver basin planning and forecasting services throughout the country; e) Improvement of transboundary operational water resources management. This includes the maintenance of minimum flows in the dry season, the sharing of weather and hydrological data (see above), seasonal basin operational plans, the coordination of the operation of cascading hydropower plants (at both sides of the border) for sediment and flow management, as well as information sharing to assist in the smooth operation of dams and other water infrastructure. This is particularly necessary during flood conditions or in the event of equipment or structural failure that could result in extraordinary flow releases. Again, the use of a compatible DSS with web interface at both sides of the border would facilitate all these water management requirements; f) Development of a 2S RBO. Viet Nam is establishing an RBO in its portion of the 2S Basin with support from the Mekong IWRM Program. This is needed as the Central Highlands faces significant water management issues that cannot be solved by the existing sectoral agencies. In the Cambodian part, such a situation does not yet exist. Likewise, Cambodia is going to establish a RBO in the 3S Basin with support from the Mekong IWRM Programme-Phase III, which is being initiated. However, there is a need for strengthening of water resources planning at the national and provincial levels in order to steer and coordinate sectoral development but in a way that maintains the most acceptable balance between development and protection (which is explored under the CRA). This sub-component supports the institutional development for transboundary water resources management in the 3S Basin. g) Conduct a pre-feasibility level assessment of promising joint investment projects and cost and benefit sharing options,

	which are identified in the CRA. This includes the testing of their sustainability and robustness in the face of future uncertainties, such as climate change. The results will be discussed between the relevant ministries and other stakeholders in the two countries. Promising projects will be incorporated in the national planning frameworks; h) Throughout the implementation of the above activities, develop the capacity of the water resources management agencies, relevant sector agencies and provincial agencies, and the NMCSs to manage transboundary water resources and climate risks. **3) Transboundary water resources management in the Sekong Basin** (shared by Lao PDR and Cambodia). This component focusses on the improvement of transboundary management and cooperation in the Sekong Basin by Lao PDR and Cambodia, including addressing of the issues and opportunities described earlier as well as the relevant results from the CRA. The output is: "Compatible standards and systems for water-related monitoring and hydrological forecasting and associated coordination mechanism and information services to support sustainable investment and management in the Sekong Basin". The activities are to some extent similar as those described above for the 2S Basin, including: a) Formulate the framework, elements and programs for structured stakeholder consultations in conjunction to the following activities; b) Improve the hydro-meteorological system for monitoring of weather and hydrological parameters, such as precipitation, water flow and water quality data, and the sharing of these data, in order to support water resources development and management planning, and flood and drought forecasting. To a limited extent this is being addressed but much more needs to be done given the major development plans in this basin, including the monitoring of impacts of infrastructure developments, for which the MRC has developed guidelines; c) Establishment of flood and drought forecasting and associated services, such as early warning and disaster preparedness. Given, the size of the investments that will be made in water and other resources development in the Sekong Basin (and the anticipated revenue streams), the development of a DSS for forecasting and operational and strategic planning should be considered (see above). Such a DSS can be best developed at the national level where an expert team can be trained to provide hydroinformatics products and services, such as flood and drought forecasting in the different parts of the country (in Lao PDR a DSS will also be needed to support the operation of hydropower cascade on the Mekong mainstream). It will be important that the hydrological networks

	and DSS systems in both countries are compatible (and with those in Thailand and Viet Nam); d) Establishment and support of a coordination mechanism between Lao PDR and Cambodia for the management of the Sekong Basin (building on the results of the ongoing Mekong IWRM Program) that address the linking of hydrological networks, basin models, and real-time weather and hydrological forecasting and the related information services and emergency response measures; e) Improvement of transboundary operational water resources management. This includes the maintenance of minimum flows in the dry season, the sharing of weather and hydrological data (see above), seasonal basin operational plans, the coordination of the operation of cascading hydropower plants (at both sides of the border, depending on plans) for sediment and flow management, as well as information sharing to assist in the smooth operation of dams and other water infrastructure. This is particularly necessary during flood conditions or in the event of equipment or structural failure that could result in extraordinary flow releases. Again, this use of a compatible DSS with web interface at both sides of the border would facilitate all these water management requirements; f) Development of the Sekong RBO in Lao PDR and Cambodia's portions of the basin to support the institutional development for transboundary water resources management in the Sekong Basin; g) Conduct a pre-feasibility level assessment of promising joint investment projects and cost and benefit sharing options, which are identified in the CRA. This includes the testing of their sustainability and robustness in the face of future uncertainties such as climate change. The results will be discussed between the relevant ministries and other stakeholders in the two countries. Promising projects will be incorporated in the national planning frameworks; h) Throughout the implementation of the above activities, develop the capacity of the water resources management agencies, relevant sector agencies and provincial agencies, and the NMCSs to manage transboundary water resources and climate risks.
Relevance, Importance, linkages	This joint project is very relevant and important given the significant issues related to development and management of water and related resources in the 3S Basin. This joint project addresses priorities in the national plans of all 3S Basin countries since the region plays a key role in the economic development of the countries. All three countries have policies to increase transboundary cooperation and coordination in order to meet their national development objectives. The joint project is also linked to regional programmes of the Joint Investment Framework (GMS) and the Basin Development

	Strategy of the MRC. The project addresses all development opportunities and most of the seven strategic priorities of the BDS, including Strategic Priority 2 (Optimize basin-wide sustainable development and benefit sharing), Priority 6 (Enhance information management, communication and tools), and Priority 7 (Increase cooperation with partners and stakeholders). The project is also linked to several bilateral economic cooperation arrangements. The project is closely linked to the Mekong IWRM Program of the World Bank that supports the improvement of hydro-meteorological systems, the development of Decision Support Systems, and institutional enhancements such as the development of RBOs, hydroinformetics centers, and transboundary cooperation mechanisms. The joint project addresses several Sustainable Development Goals, including: • SDG 1 on poverty reduction, in particular Indicator 1.5 (disaster risk reduction); • SDG 6 on water, in particular Indicator 6.3 (water quality), Indicator 6.4 (water use efficiency and scarcity), Indicator 6.5 (IWRM and transboundary management), and Indicator 6.a (international cooperation and management); • SDG 13 on combatting climate change, in particular Indicator 13.1 (resilience and adaptive capacity to natural disasters) and Indicator 13.2 (integration of CC measures in national policies, strategies and plans). The implementation of a Cooperative Regional Assessment for water resources development and management planning in the 3S Basin is long overdue. It builds on previous assessments and studies and complements planned activities, such as the assessment and planning of hydropower development in the Sekong by USAID. Given the anticipated interplay between sectoral development in the Sekong, hydropower development need to be assessed in a broader context of autonomous development and developments in other water related sectors.
Implementation arrangements	The executing agencies of this joint project would be the MRCS-NMCs. The national water resources management agency in Cambodia (MOWRAM), Viet Nam (MONRE) and Lao PDR (MONRE) are the implementing agencies. Important cooperation agencies will be the agencies responsible for the agricultural and energy sectors (MARD, MOFA, MAFF, MoE, MLMUP, MRD, MPWT, GDE, MEM, MME, EVN, EDL, EAC and others). At the regional level, the project would be overseen by the MRC and its NMC in each of the three 3S Basin countries. They will set up a steering committee with senior officials from the national planning and sector agencies, foreign affairs, relevant provinces, the MRC, and the supporting development partner(s). The steering committee will act as a “3S Basin” governance body and consider substantial project and policy issues and provide recommendations. The committee will direct the coordination

	between agencies. This will be supported at the national level by a national oversight committee, facilitated by the NMCS. Given, the large diversity of activities and considerable investments in systems and equipment, a Project Implementation Unit (PMU) could be established to manage the implementation of the joint project. The PIU would be staffed by experts from Lao PDR, Viet Nam and Cambodia, as well as a few international experts. The PIU could be established under the MRC or under the leading ministry in the three countries. The arrangements for the implementation of the project components depend on the source of funding and the nature of the development partner(s). The Cooperative Regional Assessment (CRA) under Component 1 will likely be implemented by an international consulting company working with national agencies and experts. It will be important that the consulting company has experience from similar assignments and has the required multi-disciplinary expertise and tools. Consulting companies would also be needed for the implementation of some activities under Component 2 and 3. Some other activities can be better implemented by national entities. A regional expert group of senior staff from national line agencies, provinces, and the MRCS/NMCSs could be set up to provide technical coordination and guidance to the implementation of the joint project, including: the review of approaches, methods and tools; the review of (draft) outputs and deliverables; the facilitation of data and information collection; the facilitation of interactions with Government agencies and other stakeholder groups; advising on national policies, legislation, regulations, strategies, plans, programs, and processes; preparing and supporting decision makers whenever needed; supporting the engagement of broader stakeholders; building of consensus among experts; assisting in the incorporation of relevant results and recommendations in the national planning; and others.
Impacts	The impacts of this joint project are mostly positive. In general, the current water resources development plans in the 3S Basin are not conceived through basin-wide IWRM- based planning. Thus the proposed CRA may lead to increased benefits and reduced negative impacts. Also the development of transboundary cooperation mechanisms and compatible hydroinformatics and decision support systems will improve national and transboundary water resources management, reducing risks of negative transboundary impacts and disputes. Finally, the risks of water related natural and human-made disasters will be reduced due to improvements in flood forecasting and disaster preparedness, and coordination of the operations of major water infrastructure.
Risks and challenges	A major challenge is related to the differing positions and conflicting interests among sectors and countries with respect to

	the development and management of the 3S Basin. This challenge is addressed by the nature of the proposed basin-wide CRA assessment and the development of decision-making and management tools. The CRA and the deployment of the tools will build a common understanding of the 3S Basin and develop trust and confidence among the various parties that water can be allocated and used without significant transboundary impacts. The project will also strengthen the national and transboundary water resources management agencies (MONRE, MOWRAM, MONRE, NMCs) in their steering and coordination role, so that they will be able to synthesize the differing positions and conflicting interest of the various sectors and agencies and discuss consolidated national positions at the regional level. Another challenge is to provide a level playing field for planning and management of water resources. Viet Nam further builds its planning and management capacity by developing a contemporary DSS of inter-connected databases, models and analysis tools for short and longer term planning, for flood and drought forecasting and management, and for operational water resources management. Similar systems and the related technical expertise are being developed in the Viet Nam Delta (to be managed by the new Delta Center) and in Thailand (managed by HAII which runs the National Hydroinformatics and Climate Data Center (NHC). It is argued that Cambodia, which is at the heart of the Mekong Basin, develops a compatible DSS and related technical expertise at the national level, perhaps in the form of a hydroinformatics center attached to MOWRAM, in order to "create a level playing field" with its neighbours for water resources development and management planning. The development of such a center in Lao PDR is being considered for forecasting the hydrology and coordinating the operations of cascading hydropower plants on the mainstream. Furthermore, there are challenges related to the possible arrangements for the implementation of the activities (see above) that are common to most transboundary projects. These can be addressed if the agencies involved are willing to cooperate and share data and information and by putting in place practical and strong regional implementation and supervision arrangements, such as a consulting company for the implementation, technical coordination and guidance by a regional multi-disciplinary expert group, and supervision by a regional organization (such as the MRC), possible with support from development partner(s). Finally, there is the risk of availability and sharing of data and information. A related challenge is the willingness of the countries to have their national plans assessed by a third party.
Work plan	The three components can be implemented in parallel. Implementation can start as soon as funding from the national budget and development partner(s) is secured.

	Main activities	Tentative timeline
	1) Promotion of the project for funding and implementation (role of MRCS and NMCSs)	2016 – May 2017
	2) Preparation of the detailed TOR for the cooperative regional assessment (CRA) and the TORs for (groups of) activities for the bilateral transboundary management activities	May – Sep 2017
	3) Set up of the implementation arrangements and the procurement of the necessary consultant services	May 2017 – April 2018
	4) Implementation of the Cooperative Regional Assessment (CRA)	2018-2020
	5) Improvement of transboundary management and cooperation in the Sekong Basin (including investments)	2018-2025
	6) Improvement of transboundary management and cooperation in the Sesan-Srepok Basin (including investments)	2018-2025
	7) Organization and implementation of annual stakeholder meetings to discuss progress, results, and implications	Annually

Costs estimate

A rough and incomplete cost estimate is:

Main activities	Costs (US$)
1) Promotion of the project for funding and implementation (role of MRCS and NMCSs)	In kind
2) Preparation and agreement with all key stakeholders on the package of detailed TORs	50,000
3) Set up of the implementation arrangements and the procurement of the necessary services	60,000
4) Implementation of the Cooperative Regional Assessment (CRA)	2,500,000
5) Improvement of transboundary management and cooperation in the Sekong Basin	> 5,000,000, depends on cost sharing with other projects

	6) Improvement of transboundary management and cooperation in the Sesan-Srepok Basin	> 5,000,000, depends on cost sharing with other projects
	7) Organization and implementation of annual stakeholder meetings to discuss progress, results, and implications	30,000/year
M&E	Implementation progress will be measured against the time line in the above work plan and the detailed TORs and inception reports when they are available. Impact monitoring will track whether the objectives have been achieved. Indicators could include: • The three countries have jointly implemented the Cooperative Regional Assessment (CRA); • National plans are adapted based on the recommendations in the CRA related to socio-economic, spatial and sector planning; • Agreed minimum flows in the Sesan, Srepok and Sekong are being maintained; • Compatible hydro-meteorological networks and decision support systems (DSS) are put in place in each of the countries in the 3S Basin; • The DSS systems (and their web interface) is being used for joint forecasting of floods and droughts, the sharing of seasonal operation plans, coordination of hydropower operations, and the sharing of the agreed hydrological and environmental monitoring parameters; and • Transboundary cooperation mechanism(s) accepted and operationalized by the 3S Basin countries.	
Next steps	The promotion of the project for funding and implementation (role of MRCS and NMCSs) is ongoing and can be completed in March 2017	

Annex 5: JPIN Integrated flood management in the border area of Cambodia and Viet Nam in the Mekong Delta for water security and sustainable development (Cambodia, Viet Nam)

Joint Project Information Note

Project title	**Integrated flood management in the border area of Cambodia and Viet Nam in the Mekong Delta for water security and sustainable development**
Countries	**Cambodia and Viet Nam**
Setting	The Mekong Delta begins at Kampong Cham in Cambodia and extends southwards to the East Sea in Viet Nam. The main delta is made up of a vast triangular plain of approximately 55,000 km2 with the larger part of it in Viet Nam. Phnom Penh City is located in the middle of the Mekong Delta, where the Mekong River is divided into four main river branches: i) the Upper Mekong River, ii) the Lower Mekong River, iii) the Basac River and iv) the Tonle Sap River which connects the Tonle Sap Great Lake to the Mekong River. In Viet Nam, the Mekong then divides into six main channels and the Basac into three to form the “Nine Dragons” of the outer delta. The Mekong Delta represents one of the world’s most productive ecosystems. For IWRM-based planning and flood management, the main delta cannot be considered in isolation from the Tonle Sap and its hydrological function, and from the entire Mekong River Basin, as the Delta’s hydrological conditions are dominated by the Mekong flow regime which is characterized by its great seasonality and year to year variability. Socio-economically, the Mekong Delta comprises two distinct parts: the densely populated and highly developed Viet Nam Delta and the less developed Cambodian Delta. Viet Nam began investing a century ago in improvements to navigation and drainage in the fertile areas of the Viet Nam Delta. Since the 1960s, large areas were brought under irrigation through the development of intensive canal systems, farmer-owned low-lift pumps, and flood management. Recently, Cambodia has started developing its portion of the Delta, which forms the largest remaining irrigated agricultural potential in the region. These developments are linked to investments in flood management and drainage.
Issues and opportunities	Flood management at the local level is the approach that is being followed in the Viet Nam Delta. This approach refers to the different regions in the delta with different levels of flooding (deep, shallow) and distinct boundary conditions requiring different flood control solutions. This regional approach has been also suggested for the Cambodian Delta. However, it is now becoming visible that the traditional approach of “living with floods” cannot provide for a safe, prosperous and sustainable Mekong Delta in the face of: • Climate change, which increases the peak flood flows and sea level rise in the coastal zone; • Intensified upstream development which causes significant changes, particularly river flow regulation;

	• Further development of the remaining floodplains by urbanization and other developments, which reduces the flood storage and conveyance capacity of the floodplains; and • An increasing population with higher living standards and more property to lose, which demands more effective flood protection and responses to all changes. These risks are growing as the populations and economies grow and climate change advances, putting more people and assets in harm's way. Recent assessments (MRC/FMMP, December 2015) indicate that flood risks could increase substantially in the main cities of the Mekong Delta and reach unacceptable levels already in 2030. Also droughts and salt water intrusion in the dry season would worsen. The management of floods during the wet season is closely linked to drought management. At the same time, it is observed that there is need to manage flood for diverse needs and benefits in the Mekong Delta area: for present and future water security and development, for the ecosystem services and environment, and for protection from its risks and harmful effects. In the national planning of both countries, the management of flood and droughts has been prioritized in order to achieve the countries' socio-economic development goals, including the transition to high income status in the longer-term. However, Cambodia and Viet Nam cannot achieve their water security goals alone. International experience shows that joint management and development of the Mekong Delta will be needed, along with cost and benefit sharing deals. This is particularly important in the border area between the two countries where border canals can be improved and flood diversions constructed. There is a sense of urgency as the solutions in terms of water infrastructure and spatial planning are complex, controversial, costly and require a long preparation and implementation period. A part of the solutions may have to be found outside the Mekong Delta, which provides limited water retention and flood diversion options. This joint project will benefit from the many studies, assessments and plans that are available for the Mekong Delta, which greatly facilitate the project's implementation. Furthermore, the project will build on the ongoing transboundary dialogue under the WB supported Mekong IWRM Program that resulted in a joint issue paper, the WB supported Mekong Delta Integrated Climate Resilience and Sustainable Livelihoods Project in Viet Nam, and MRC's ongoing "Initial studies to demonstrate the formulation of strategic directions to manage existing, future and residual flood risks in the Lower Mekong Basin".
Objectives	To address the above issues and opportunities, Cambodia and Viet Nam have developed a joint project with the following two objectives: 1) To develop an integrated strategy for flood management of the Mekong Delta shared by Cambodia and Viet Nam, including a phased action plan; and

	2) To prepare and implement “no regret” investments and the Strategy’s plan of actions in the border area of Viet Nam and Cambodia.
Project Components	To achieve the above objectives, the two countries have identified two project components for implementation: a review, assessment and planning component and a component that is directed at the preparation and implementation of investments in the border area between Viet Nam and Cambodia for flood diversion, agricultural improvements and other functions. **1) Integrated flood management in the Mekong Delta**. This component builds on a number of studies and assessments, strategies and plans that have been prepared during the last 10-20 years related to the development and management of the Mekong Delta, including the management of flood risks and the study of flood performance in the last 5 years based on changes from climate change and delta and upstream development. The aim is to arrive jointly (Viet Nam and Cambodia) at a common understanding of flood issues and strategic directions for socio-economic and spatial planning, and the further investments and measures that are needed in the short to longer term to manage flood risks in urban and rural areas of the Mekong Delta at an acceptable level. It is anticipated that the major part of the investment plan can be implemented nationally through coordinated national implementation but there will be also scope for joint investments and benefit and cost sharing deals. Although the focus is on the developing solutions in the Mekong Delta, the strategy will be developed by considering the Tonle Sap and the context of the entire Mekong Basin as developments upstream can have significant bearing on the volumes of water that enter the Mekong Delta during the wet and dry season. The intended Outcome 1 is: “A Mekong Delta Integrated Flood Management Strategy and Plan of Action adopted by the two countries to promote transboundary cooperation, initiate early investments, and guide successive socio-economic and sector plans of Government agencies”. The activities will include: a) The preparation of a detailed TOR followed by setting up the best possible ‘project’ implementation structure that puts national and provincial policy makers and decision-makers clearly in the driver’s seat, and uses the best experience, knowledge and skills in Viet Nam and Cambodia for the day-to-day implementation. The latter is important as land and water management in the delta is very complex, including in the border area. Given the importance of the strategy for the future development and management of the Mekong Delta, a stakeholder platform needs to be established as well; b) The review of many relevant documents could start with the Basin Indicative Plan of the 1970s which takes a basin-wide view of flood management, the MRC/KOIKA reports (2000), the national sector review by the CNMC (2003), the Viet Nam

	Delta Strategy (2004), the MRC/Haskoning reports (2009 and 2010), the Mekong Delta Plan (2013), the recent MRC Initial Studies (2015), the ongoing WB supported Delta Integrated Climate Resilience and Sustainable Livelihoods project, and many other reports, papers and maps that relate to development and management of the Mekong Delta. Recent advances in remote sensing can be used to further improve the understanding of the historical development in the Delta and the related changes in water management and flood performance; c) Develop, describe, and visualize an accurate assessment of the current situation and trends, and the future implications and possible solutions and measures. This should provide both Governments with a clear picture of what is going on in the two countries and of the issues and opportunities; d) Review and improve existing SWOT analyses of the Mekong Delta and the alternative long-term socio-economic and spatial development scenarios that have been developed for the Cambodian and Viet Nam portions of the Mekong Delta. These scenarios have names such as: “the congested floodplain”, “the diversified landscape”, “the contested floodplain” (Cambodia) and “corridor industrialization”, “dual node industrialization”, “food production”, and “agro-business industrialization” (Viet Nam). Based on the outcomes of extensive stakeholder consultations, select the most supported scenarios for further planning; e) Discuss and agree on acceptable levels of flood risks (in terms of probability of flooding and flood hazard) for the distinguished land use categories in the scenarios (urban areas, industrial areas, irrigated agriculture, aquaculture etc.) by considering development scenarios and impacts of upstream development. Also discuss and agree on a range of environmental, social and economic indicators to assess the positive and negative impacts of potential flood and drought mitigation measures; f) Improve MRC’s DSF model as needed to be able to model the land use and relevant infrastructure in the selected development scenarios and to test the effectiveness and the positive and negative impacts of a range of plausible measures and combination of measures for selected climate change scenarios and scenarios for upstream development. The measures to be tested could include flood diversions (with and without dikes) towards the Gulf of Thailand and the Vam Co River, the regulation of the storage in the Tonle Sap (to delay early flood downstream of Phnom Penh and delay the outflow to improve low flow conditions in the Viet Nam Delta), improvement of (border) canals and colmatage canal systems, controlled flooding in deep flooded areas and the remaining natural areas, the improvement of dikes, levees and embankments, the maintenance of flood conveyance zones, more use of pumping to discharge water in the coastal zone, and other measures. Many of these measures may have also

	direct positive and negative impacts for (irrigated) agriculture, the environment, navigation, tourism, and fisheries; g) The above tests will provide information on what is possible in terms of achieving the agreed flood risks (see above), and the related costs, benefits and impacts. Perhaps changes have to be made in the socio-economic/spatial scenarios or the agreed flood risk levels have to be reconsidered. It is also quite possible (based on existing studies) that it will simply be not possible to allocate, divert, store, distribute future huge flood inflows into the Mekong Delta. In that case, the feasibility of upstream retention as a flood mitigating measure could be considered as well. All of this information will need to be discussed with the stakeholders and the policy and decision makers in the two countries. This step may require significant negotiation and water diplomacy; h) The feed-back from stakeholders will likely lead to another round of testing and assessments, and discussions on integrated flood management with socio-economic/spatial planning in the Mekong Delta area and a range of national and joint projects and actions that are needed in the short and longer term for a safe, prosperous and sustainable Mekong Delta; i) Explore possible "no-regret" water related structural and non-structural integrated flood management and development projects and activities that can be implemented in the short-term, and which are robust in the face of potential socio-economic/spatial and climate change scenarios and can be implemented in the short term. This will likely include also joint investment projects and joint activities; j) Pull all results and outcomes from stakeholder consultations and agreements reached among decision-makers together in a concise report that sets out a clear (draft) strategy for the integrated flood management of the Mekong Delta, including a phased plan of investments and actions that can be implemented nationally (with or without coordination) or jointly. Also provide the options for establishing a transboundary coordination mechanism. All technical details will be presented in technical annexes; k) The draft strategy and investment plan will be subject to high level discussion and negotiations, which will also decide on the preferred coordination mechanisms for the integrated flood management of the Mekong Delta. The final documents will include a chapter that distributes the responsibilities for the implementation of the various measures (investments, actions) to the responsible local, national and regional agencies for their incorporation in successive socio-economic and sector planning. **2) Improvement of canals and construction of flood diversions in the Cambodia – Viet Nam border area.** This component will support the planning, detailed design and rehabilitation and improvement of border canals between the

	Cambodian Provinces of Prey Veng and Svay Rieng (where the canals are named Prek Tanou and Prek Smao) and in the Viet Nam provinces of Dong Thap and Long An, as well as the construction of routes and zones for flood drainage, including from the Mekong and Bassac (hereafter called "flood diversions") in the Viet Nam border area (and possibly the Cambodian border area). The proposed investments are a top priority for Cambodia and Viet Nam for early implementation as part of the Mekong Delta Strategy/Action Plan (see Component 1 above). The intended Outcome 2 is: "The improvement of border canals and the construction of flood/irrigation diversion/drainage infrastructure in the border area of Cambodia and Viet Nam bring mutual benefits for the people in the border provinces of the two countries". The intended Outcome 3 is: 'Transboundary cooperation strengthened through the efficient and effective support of the transboundary coordination mechanism and monitoring system". The activities will include the following: a) The review of existing information on the proposed projects. These include for the border canals: the preparatory reports of 2009/2010 for WUP2 (now Mekong IWRMP) on the improvement and operation of the Prek Tanou/Caico border canal and existing reports on the planning and construction of possible flood diversions, including the MRC/KOIKA report (2000), the MRC/Haskoning report (2010), the Mekong Delta Plan (2013) by the Governments Viet Nam of the Netherlands, and the Report on Revision of Cuu Long Delta Flood Planning; b) Conduct a pre-feasibility study of the rehabilitation and improvement of the border canals, considering deepening and widening sections of the canals, elevating canal embankments, expansion of irrigation, and other interventions to improve agricultural production, navigation and trade, and mitigate flooding and water quality deterioration, which all would contribute to higher incomes and poverty alleviation, which is high on the Cambodian side. The study will likely require some topographic, subsoil and socio-economic surveys, and hydraulic modelling. Given that the canals form the border between the two countries, the pre-feasibility study should be a joint undertaking between Cambodia and Viet Nam with engagement of the local stakeholders. Water sharing rules may have to be agreed. The pre-feasibility study will include a check how the canal improvements fit in the Mekong Delta Strategy/Action Plan (see Component 1 above). Also the modalities for joint improvement and operation of the border canals, with cost and benefit sharing will be assessed; c) Conduct a pre-feasibility study of the possible construction of flood diversions, with a view to increasing the capacity to divert flood waters that spill over the border between the Plain of Reed and Long Xuyen Quadrangle in Viet Nam and discharge the flood waters to the Gulf of Thailand, the Mekong, and the Vam Co river. The diversions could be located in the border

	area of the two countries (as studied by Haskoning in 2009/2010 or further downstream in Viet Nam Delta (as suggested in the Mekong Delta Plan of 2013). The flood diversions (possibly with sluice gates to store water) could generate large benefits in flood protection and agricultural production but, depending on the trajectory of the diversion canal, also high resettlement costs (to recreate space) and environmental impacts, particularly in areas underlain by acid sulphate soils. The study may require subsoil investigations, socio-economic surveys, processing of satellite data, and hydrological and hydraulic modelling. Also this study will consult with local stakeholders. The pre-feasibility study will include a check how the possible flood diversions fit in the Mekong Delta Strategy/Action Plan (see Component 1 above). Joint implementation and cost and benefit sharing may be an issue in case of a flood diversion in the border area. It is noted that the MRC/KOICA study (2000) identifies also flood diversions in Cambodia to improve irrigated agriculture, and these will be considered in the delta strategy preparation under Component 1. d) Discussion of the results of the pre-feasibility studies among policy and decision-makers of the responsible sectors and provinces in the two countries. These discussions will address also the needs and options for joint or coordinated investments for construction and the subsequent management of border infrastructure. The results of these discussions will feed into the TOR for feasibility studies. e) Feasibility studies. Since the rehabilitation and improvement of border canals and the construction of flood diversion are large infrastructure projects, the feasibility study and conceptual design is a major undertaking and includes substantial surveys and environmental and social impact assessments in accordance with national regulations, as well as those of development partners (such as the WB safeguard policy) if they are involved. The feasibility study addresses all possible benefits, costs, impacts and risks of the project during the construction and operation phases, as well as complementary measures that may be needed to offset or mitigate impacts, and engages the potential beneficiaries and adversely affected people. The feasibility study also assesses the options for the implementation arrangements during the construction phase and operation phases, as well as cost and benefit sharing options for decision making; f) Concluding a bilateral agreement. In the case of shared border canals and flood diversions, the Governments of Viet Nam and Cambodia would conclude an agreement on project implementation and operation and maintenance, underpinned by cost and benefit sharing. The agreement can take the form of a joint-working agreement or an investment agreement; g) Detailed design of the improved canals and flood diversions followed by implementation. This phase further elaborates and defines each aspect of the project by descriptions, drawings,

	specifications, and bill of quantities, followed by procurement of goods, works and services, and implementation in accordance with national regulations, the above bilateral agreement in the case of a joint investment, and the requirements of possible financial institution, such as a multilateral development bank; and h) Design, establishment and operation of the required monitoring systems to monitor implementation progress and impacts, and guide adaptive management.
Relevance, Importance, linkages	This joint project is very relevant and important for Cambodia and Viet Nam as integrated flood management in the Mekong Delta is the top priority for both countries to ensure water security and sustainable development. It has been included in the National Planning. This joint project builds on the transboundary dialogue and resulting issues paper under the WB supported Mekong IWRM Project. It is linked to ongoing assessments and studies of the MRC (in particular the "Council Study" and the "Initial Studies"), the "Mekong Delta Integrated Climate Resilience and Sustainable Livelihoods Project", supported by a loan to Viet Nam from the World Bank, and national policies and actions, such as the "Report on Revision of Cuu Long Delta Flood Planning" which is submitted for approval by the Government of Viet Nam, the "Strategic Ideas for Flood Management in the Area Belonging to Cambodian Delta areas", and the upcoming Cambodian Master Plan for Land and Water. This joint project is also linked to most development opportunities and strategic priorities in MRC's Basin Development Strategy 2016-2020, including Opportunity 4 (Flood and drought management) and Priority 2 (Optimize basin-wide sustainable development and cost and benefit sharing), Priority 5 (Improve national water resources development and management) and Priority 7 (Increase cooperation with partners and stakeholders). The project addresses Key Result Area 1, Outcome 2, Output 2.2 "Regional strategies for flood management developed and approved" of the MRC SP for 2016-2020. And the project implements Activity 2.2.2 of the MRC Strategic Plan 2016-2020: Prepare strategies for flood management in the Cambodia and Viet Nam Mekong delta (flood plain) and for the Thai-Cambodian border area. The joint project addresses several Sustainable Development Goals, including: • SDG 1 on poverty reduction, in particular Indicator 1.5 (disaster risk reduction); • SDG 6 on water, in particular Indicator 6.3 (water quality), Indicator 6.4 (water use efficiency and scarcity), Indicator 6.5

	(IWRM and transboundary management), and Indicator 6.a (international cooperation and management); • SDG 13 on combatting climate change, in particular Indicator 13.1 (resilience and adaptive capacity to natural disasters) and Indicator 13.2 (integration of CC measures in national policies, strategies and plans).
Implementation arrangements	The executing agencies of this joint project would be MRC and MOWRAM in Cambodia and MARD and MONRE in Viet Nam will be implementing agencies. They will set up a steering committee with senior officials from the national planning and sector agencies, foreign affairs, relevant provinces, the MRC, and the supporting development partner(s). The steering committee will act as a "Mekong Delta" governance body and consider substantial project and policy issues and provide recommendations. The committee will direct the coordination between agencies to support the joint project, and solve issues that cannot be solved otherwise. The steering committee would meet 2-3 times per year and report to a deputy minister of MONRE, MARD and the MOWRAM Minister. This will be supported at the national level by a national oversight committee, facilitated by the NMCS. The arrangements for the implementation of the project components depend on the source of funding and the nature of possible development partner(s). The strategy and investment plan under Component 1 could be implemented by a consortium of national institutes and an international consulting company with ample experience and skills specialized in integrated water resources and flood management, socio-economic, spatial and sector planning, and strong in water resources modelling, and uses of the latest satellite and computer technologies. Technical guidance would be provided by a regional Expert Group, facilitated and supported by the MRC. Also the pre-feasibility study of the proposed border canal rehabilitation and improvement project could be implemented by a consulting firm working with the relevant institutes, agencies and key stakeholders at both sides of the border. The pre-feasibility study of possible flood diversions outside the border area could be implemented by one of the institutes in the Viet Nam Delta working with the relevant provinces. For the construction projects in Viet Nam, MARD would be the leading agency, MONRE would be responsible for water management and environmental issues including EIAs, and the Provincial Peoples' Committee would be responsible for spatial planning and resettlement. In Cambodia, MOWRAM would be the leading agency. Supporting Agencies would be MOE, MAFF, MRD, MPWT, MLMUPC, the TSA and the Provincial Authorities. Detailed roles and inputs will be discussed during proposal preparation. Alternatively, a Project Implementation Unit (PIU) could be established to implement the joint project. The PIU would be

	staffed by experts from Viet Nam and Cambodia, as well as a few international experts. The PIU could be established under the MRC or under the leading ministry in the two countries.
Impacts	The joint project will have major positive and negative impacts but "do nothing" is not an option. The strategy for integrated flood management of the Mekong Delta will substantially impact the socio-economic and spatial planning in the two countries, within and outside the delta area, in order to ensure a safe, prosperous and sustainable Mekong Delta. The proposed border canal rehabilitation and improvement project may have significant positive socio-economic impacts and minor negative impacts. Depending on the design of the improved canals, the negative impacts could be considerable in the Viet Nam portion of the border area. The possible flood diversions may have major positive economic impacts as well as substantial negative environmental impacts as demonstrated in the MRC/Haskoning report (2010) for a flood diversion from the Bassac to the Gulf of Thailand in the Cambodian/Viet Nam border area.
Risks and challenges	A major challenge may be related to the differing positions and conflicting interests of Viet Nam and Cambodia with respect to the development and management of the Mekong Delta. Partly this stems from historical national planning which is usually designed to benefit national interests, and therefore mostly sub-optimal at the delta and basin scales. As a result, implementation of the plans could fail to address longer term challenges of water security but also yield tensions and potential conflicts in the immediate terms. Therefore, it is anticipated that the joint preparation of an integrated strategy for flood management in the shared Mekong Delta (and joint investments and work in the border area) is an opportunity for both countries to transcend tensions that may have resulted from uncoordinated development, and build trust and confidence that delta-wide "needs" such as flood protection and economic and social development can be achieved. To implement such a process, and reach benefit sharing deals, will not only require sound technical knowledge and assessment by water engineers and specialists, but also the negotiation and political skills of water diplomats, strategists and others. All of this expertise and skills should be represented in the proposed steering committee (see under "Implementation arrangements"). Additionally, the technical capacity that is available in the countries and the MRCS may need to be complemented by a trusted multilateral partner who could help move the regional water security and benefit sharing agenda among the countries and secure the political will and commitment from their leaders. There may be also significant risks and challenges in the implementation of the investment projects, such as agreeing on water sharing rules for the border canals or resettlement and

<table>
<tr><td></td><td>environmental impacts of possible flood diversions, but these have to be determined.

Although a rich data and information base exist at the Delta area level, there may be data shortages at the local level, in particular in the border area between the two countries, which will be addressed by surveys. There is also the challenge of sharing of the available data and information with the various parties.

There may be broader risks (outside the water sector) such as the issue of border demarcation.

The availability of funding for the implementation of Component 1 is thought to be less of an issue, as MRC has secured funding for continuing their work on the “Initial Studies” while also funding from the national budgets and development partners seems available.</td></tr>
<tr><td>Work plan</td><td>The two project components can be implemented in parallel and inter-dependently. Implementation can start as soon as funding from the national budget and development partner(s) is secured.

<table><tr><th>Main activities</th><th>Tentative timeline</th></tr><tr><td>1) Promotion of the project for funding and implementation (role of MRCS and NMCSs)</td><td>Ongoing</td></tr><tr><td>2) Preparation of the detailed PID, TOR, or proposal involving all Government agencies and key stakeholders and related field visits and meetings</td><td>Apr – Jul 2017</td></tr><tr><td>3) Set up of the implementation arrangements and the procurement of the necessary consulting services</td><td>Aug – Dec 2017</td></tr><tr><td>4) Development of the integrated strategy for flood management in the Mekong Delta with the phased investment and action plan (the Mekong Delta Strategy/Action Plan)</td><td>2018-2020</td></tr><tr><td>5) Incorporation of the strategic directions, investments and actions in the national socio-economic, spatial and sectoral planning, followed by implementation</td><td>2021 onwards</td></tr><tr><td>6) Pre-feasibility study of the rehabilitation and improvement of the border canals, including surveys</td><td>2018-2019</td></tr><tr><td>7) Pre-feasibility study of the construction of flood diversions in the border area, including surveys</td><td>2018-2019</td></tr></table></td></tr>
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<tr><td></td><td><table>
<tr><td>8) Implementation of feasibility studies followed by detailed design of feasible and agreed projects</td><td>2020-2022</td></tr>
<tr><td>9) Implementation of the feasible and agreed projects in the border area</td><td>2023 onwards</td></tr>
</table></td></tr>
<tr><td>Cost estimate</td><td>The preliminary cost estimate is as follows:<table>
<tr><th>Main activities</th><th>Costs (US$)</th></tr>
<tr><td>1) Promotion of the project for funding and implementation (role of MRCS and NMCSs)</td><td>In kind</td></tr>
<tr><td>2) Preparation and agreement of detailed TORs for each of the components involving all Government agencies and key stakeholders and the related field visits ad meetings</td><td>80,000</td></tr>
<tr><td>3) Set up of the implementation arrangements and the procurement of the necessary consulting services</td><td>100,000</td></tr>
<tr><td>4) Development of the integrated strategy for flood management in the Mekong Delta with the phased investment and action plan (the Mekong Delta Strategy/Action Plan)</td><td>2,500,000</td></tr>
<tr><td>5) Facilitation of the incorporation of the strategic directions, investments and actions in the national socio-economic, spatial and sectoral planning, followed by implementation</td><td>50,000</td></tr>
<tr><td>6) Pre-feasibility study of the rehabilitation and improvement of the border canals, including surveys</td><td>1,000,000</td></tr>
<tr><td>7) Pre-feasibility study of the construction of flood diversions in the border area, including surveys</td><td>1,000,000</td></tr>
<tr><td>8) Implementation of feasibility studies followed by detailed design of feasible and agreed projects</td><td>TBD</td></tr>
<tr><td>9) Implementation of the feasible and agreed projects in the border area</td><td>TBD</td></tr>
</table></td></tr>
<tr><td>M&E</td><td>Implementation progress will be measured against the time line in the above work plan and the detailed TORs and inception reports when they become available.

Impact monitoring will track whether the objectives have been achieved. Indicators could include:</td></tr>
</table>

	• The established steering committee, includes senior officials of national planning agencies and diplomats of foreign affairs, and provides guidance and takes decisions on substantial matters, and reports to the deputy water ministers and relevant provincial governors in Cambodia and Viet Nam; • The Mekong Delta Strategy/Action Plan for integrated flood management in the Mekong Delta and the associated investment and action plan is adopted for implementation by both Governments; • Agreement is reached by the two Governments on the implementation of at least one joint investment project and/or cost and benefit sharing deal in their border area in the Mekong Delta; • National socio-economic, spatial and sector plans incorporate the strategic directions, investments, and actions for de development and management of the Mekong Delta.
Next steps	The promotion of the project for funding and implementation (role of MRCS and NMCSs) is ongoing and can be completed in the beginning of 2017.

Mekong River Commission

Cambodia • Lao PDR • Thailand • Viet Nam

For sustainable development

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