



2021–2030 Basin Development Strategy & MRC Strategic Plan 2021–2025



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The IWRM-based

**Basin Development Strategy
for the Mekong River Basin 2021–2030 &
MRC Strategic Plan 2021–2025**

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PREFACE

It is my pleasure to present to you, on behalf of the Mekong River Commission, the Basin Development Strategy 2021–2030 and the MRC Strategic Plan 2021–2025.

By approving these documents in November 2020, the MRC Council underlined our commitment to bring about responsible development and ensure that social, economic and environmental improvements lead to better living standards for all the Mekong basin countries and peoples.

Unlike previous versions of the Basin Development Strategy, which were developed every five years, this edition will be implemented over a ten-year timeframe, focusing on the entire Mekong River Basin from the perspectives of the MRC Member Countries: Cambodia, Lao PDR, Thailand and Viet Nam. This is because we believe that the basin's sustainable development and current water security issues can only be addressed effectively at the basin scale through cooperation between all the six riparian countries and those established cooperative bodies, including the civil society organisations who represent the voices of the Mekong communities. A further change sees the Basin Development Strategy and the MRC Strategic Plan, previously published as two separate documents, fully integrated into a single publication.

The Strategy aims at guiding all relevant actors – not just the MRC – involved in the development and management of the Mekong's water and related resources to achieve improvements for the Mekong River Basin as laid down in the 1995 Mekong Agreement. The Strategy covers all water and related sectors, integrates the relevant

Sustainable Development Goals, and internalises a gender and vulnerability approach that emphasises diversity, equity, and inclusion.

As a unified corporate plan that is fully responsive to the new Basin Development Strategy, the MRC Strategic Plan sets out coherent activities for the MRC to effectively implement the Basin Development Strategy and strengthen the organisation over the next five years.

Both the Basin Development Strategy 2021–2030 and the MRC Strategic Plan 2021–2025 take stock of the experiences, lessons learned, and progress achieved through the implementation of earlier versions, and includes input from a broad range of regional, national and local stakeholders.

I believe that the Strategy and Plan will serve as a unified instrument that will guide us towards more responsible development and protection of the Mekong and its related resources for an economically prosperous, socially just, environmentally sound and climate change resilient Mekong River Basin.

A handwritten signature in black ink, consisting of a stylized, elongated shape with a small 'N' or similar character at the bottom.

H.E. Mr Sommad Pholsena

Minister of Natural Resources and Environment, Lao PDR
Chairperson of the MRC Council for 2020



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ABBREVIATION AND ACRONYMS

ACMECS	Ayeyarwady-Chao Phraya Mekong Economic Cooperation Strategy
ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
BDS	Basin Development Strategy
BFMS	Basin-wide Fisheries Management Strategy
CRBMFs	Core River Basin Management Functions
CSOs	Civil Society Organizations
DAGAP	Data Acquisition and Generation Action Plan
DSF	Decision Support Framework (name of MRC DSS)
DSS	Decision Support System
ESIA	Environmental and Social Impact Assessment
FAO	Food and Agriculture Organisation
GDP	Gross Domestic Product
GIS	Geographic Information System
GMS	Greater Mekong Sub-region
GW	Gigawatt, 1000 MW
GWh	Gigawatt hours, 1 million kilowatt hours
HYCOS	Hydrological Cycle Observing System
IWRM	Integrated Water Resources Management
JAP	Joint Action Plan
JCCCN	Joint Committee on Coordination of Commercial Navigation on Lancang-Mekong River
JEM	Joint Environmental Monitoring
LMB	Lower Mekong River Basin
LMC/MLC	Lancang-Mekong Cooperation / Mekong-Lancang Cooperation
LMI	Lower Mekong Initiative
MASAP	Mekong Climate Change Adaptation Strategy and Action Plan
MLC Water	Mekong-Lancang Cooperation on water resources

M&E	Monitoring and Evaluation
MoU	Memorandum of Understanding
MRB-IF	Mekong River Basin Indicator Framework
MRC	Mekong River Commission
MRC SP	Mekong River Commission Strategic Plan
MRCS	Mekong River Commission Secretariat
MTR	Mid-Term Review of the MRC Strategic Plan
MUSP	Mekong-United States Partnership (formerly LMI)
MW	Megawatt
NIP	National Indicative Plan
NPV	Net Present Value
NMCS	National Mekong Committee Secretariat
PDIES	Procedures for Data and Information Exchange and Sharing
PMFM	Procedures for the Maintenance of Flows on the Mainstream
PNPCA	Procedures for Notification, Prior Consultation and Agreement
PWQ	Procedures for Water Quality
PWUM	Procedures for Water Use Monitoring
RFDMC	Regional Flood and Drought Management Centre
RSAT	Rapid Basin-wide Hydropower Sustainability Assessment Tool
SBEM	Strategy for Basin-wide Environmental Management
SDG	Sustainable Development Goal
SHDS	Sustainable Hydropower Development Strategy
SIMVA	Social Impact Monitoring and Vulnerability Assessment
SOBR	State of the Basin Report
TbEIA	Transboundary Environmental Impact Assessment
UN	United Nations
USD	United States Dollar
WB	World Bank

EXECUTIVE SUMMARY

Introduction

A whole basin and all relevant actor Strategy. Unlike previous editions, this Basin Development Strategy (BDS) 2021–2030 is prepared and agreed for a ten-year period and focuses on the entire Mekong River Basin. The BDS 2021–2030 guides all relevant actors involved in Mekong water-related issues towards achieving improvements in the environmental, social and economic state of the Mekong River Basin, which is periodically recorded in the State of Basin Report (SOBR). The BDS 2021–2030 is prepared under the framework of Mekong River Commission (MRC) cooperation.

A responsive Strategy with a new direction. The 2018 SOBR highlights major changes underway in the basin, driven by population and economic growth. The extent of water resources development already underway, and the resulting environmental and water security issues, explain the major strategic shift in this BDS 2021–2030 beyond water resources planning to encompass operational management, including the transboundary coordination of operations of dams and other water infrastructure. Water resources development will still be needed, however, to support socioeconomic development, build climate resilience, and manage flood and drought risks, which will require a more proactive regional planning approach than in the past.

Guided by Heads of States Declarations. The BDS 2021–2030 is guided by the Siem Reap Declaration of the Third MRC Summit ‘One Mekong One Spirit’ on 5 April 2018, as well as Heads of States Declarations of other Mekong cooperation frameworks such as the Mekong-Lancang Cooperation, the Greater Mekong Subregion cooperation (GMS), and Ayeyawady-Chao Phraya-Mekong Economic Cooperation Strategy (ACMECS). The Strategy integrates the Sustainable Development Goals (SDGs) relevant to water resources management and internalizes a ‘gender and vulnerability’ approach to account for intersectional inequity and the different dimensions of vulnerability.

Basin trends and outlook

Rapid development and poverty reduction. The Mekong River Basin is a highly dynamic region with a vast endowment of natural resources, a young and increasingly well-connected population with multiple avenues of growth and opportunity ahead. Over recent decades, rapid economic gains with steep reductions in fertility rates and increasing urbanisation have contributed to higher incomes, reduced poverty, improved

food security and greater access to improved water sources, sanitation, and electricity. Nevertheless, the gains have not been equally distributed and substantial challenges to the sustainable development of Mekong River Basin remain (Table E1).

The hydrology of the Mekong is changing. In the upper part of the basin, dry season flows are increasing and flood season flows decreasing (Figure E1) because of increasing storage for hydro-electricity generation throughout the year.¹ Rapid river level fluctuations, including due to climatic variability, are becoming the norm. Construction and uncoordinated operation of hydropower facilities, now including the first two Lower Mekong River Basin (LMB) mainstream dams, are changing the flow environments in sections of the river with implications for water quality and suitable habitat for aquatic organisms. Sediment transport has dropped precipitously since the construction of the Upper Mekong hydropower cascade and other industrial activities such as sand mining, with attendant risks to wetland and floodplain productivity, riverbank erosion and delta forming processes.

Pressure on the environment is increasing also in other ways. There are classic signs of heavy fishing pressure and fish populations are also under threat from habitat destruction and in-stream barriers limiting migration, leading to decreased fish yield. Fisheries of the future, both in terms of species mix and population abundance, are likely to be quite different to those of the past. Wetlands have also declined in area and those that remain are increasingly degraded. The ecosystem services they provide including habitat, floodwater storage, and protection against coastal erosion, are under threat. Watersheds and floodplains face pressures from land use changes driven by population and economic growth.



¹ The impact of climate change on the flow regime is uncertain but may also be having an impact (see State of the Basin Report 2018).

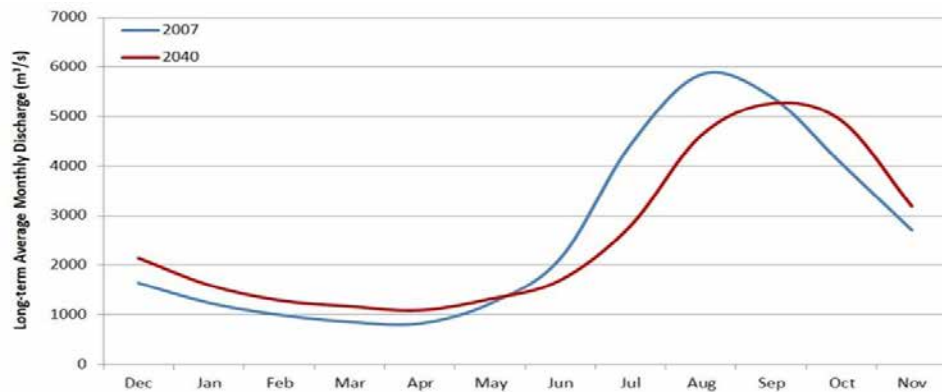


Figure E1. Projected change in annual flow hydrograph at Chiang Saen, which is already evident. The same change is evident to a greater or lesser extent at different places along the mainstream down to the delta

The challenges facing the Mekong Delta are particularly acute. Reduced replenishment of sediment from upstream, subsidence due to groundwater extraction, sediment extraction² which deepens channels and exacerbates the impacts of tides on erosion, and increased salinity intrusion are some of the significant issues requiring urgent attention. On top of this is the increasing risk of major floods and droughts due to climate change and reduced floodwater storage capacity in the Mekong Delta.



² Commonly referred to as sand mining.

There are significant inequalities between different groups in society. Rural populations lag their urban counterparts on almost all indicators of community wellbeing. Despite significant reductions in national poverty rates, large numbers of poor, natural resource dependent communities are likely to persist for some time, along with improving but still present gender inequalities in paid and unpaid work. Substantial data and information gaps exist for people in vulnerable situations – where they live and how they are impacted by water-related development and operations.

Economic growth is strong across all water-related sectors. Agriculture, fisheries and forestry are a declining share of the overall economy of basin countries, but still employ large numbers of people. Rising global demand for food and large inflows of foreign direct investment in these sectors are supporting strong growth in the value of agricultural products. Capture fisheries and aquaculture, hydropower production and navigation have all shown strong growth in recent years. Based on current national plans, hydropower, irrigated agriculture, navigation, and aquaculture sectors are likely to continue growing strongly but will need integrated basin-scale thinking to ensure long-term sustainability and inclusive growth, particularly in the face of climate change.

The basin's climate is changing. Average basin-wide temperatures and precipitation are increasing and sea-level around the delta is rising. However, there is no evidence to-date of more intense rainfall events or tropical storm activity. There may have been a slight increase in flood peaks and flooded areas and a decrease in drought conditions over recent decades, but further monitoring over longer time periods is necessary. Future scenarios point to much higher temperatures and the potential for more extreme floods and droughts.

A sense of urgency is growing among stakeholders on the need to move basin development towards more “optimal” and sustainable opportunities that address long-term needs, including water, food, and energy security. Experience from other regions suggests that joint management and development, with cost and benefit sharing agreements will be necessary if the people of the Mekong region are to transition to middle/high income status in a manner that is in long-term balance with the basin's ecosystems. The significant investment in data and knowledge under the Mekong cooperation of the past sixty years means the Mekong River Basin is in a better position than most basins that have already reached such agreements.

Table E1. Summary of basin conditions, trends and outlook for key issues identified in the 2018 State of the Basin Report and recent MRC scenario assessment work

Selected Strategic Indicators	Key Issues	Condition	Outlook
Water flow conditions	Change in long-term flow regime	●	↔
	Rapid water level fluctuations		↘
Water quality and sediment conditions	Risks to water quality	●	
	Reduced sediment transport	●	↘
Status of environmental assets	Loss of wetlands	●	↘
	Fish populations	●	↘
Living conditions and wellbeing	Household food and water security	●	↔
	Inequality of access	●	
Employment in MRC water-related sectors	Employment	●	↔
	Gender equality	●	↔
Economic value of MRC water-related sectors	Agriculture		↗
	Hydropower	●	↗
	Fisheries and aquaculture		↔
	Navigation		↗
Climate trends and extremes	Temperature increases	●	↘
	More severe floods and droughts		↔

● No immediate concerns ● Some significant concerns to address ● Considerable concern ● Insufficient data
 ↗ Expected to improve ↔ Some improvement and some decline, or uncertain ↘ Expected to decline

Strategic responses and challenges

The trade-offs are much larger than needed between the economic and environmental dimensions of water resources development in the Mekong region. They are the result of largely independent national planning, supplemented by regional planning that so far has been limited to assessing the acceptability of the transboundary impacts of national plans. No alternative plans or projects have been put forward for the countries to consider. So far, these regional assessments have not led to significant changes in nationally planned water resources development.

But it is not too late. Although major observed impacts, such as the reduction in sediment flow and wetlands, are generally irreversible, there is still a lot to be gained from a more proactive regional planning and management approach that also addresses climate change and related water security challenges. This BDS initiates this approach and takes regional cooperation a step further towards more optimal and sustainable development by emphasising:

- **More proactive regional planning**, which involves moving beyond the set of infrastructure projects that the basin countries are currently planning to identify new joint investment projects and national projects of basin-wide significance that could increase synergies and reduce trade-offs and vulnerabilities at both the basin and national levels, and provide a comprehensive response to climate change and related flood and drought challenges. Such joint and national projects range from upstream multi-purpose storage development to downstream floodwater management and water utilisation;
- **Coordination of basin management operations** to increase positive transboundary effects and mitigate negative impacts in an increasingly developed and regulated Mekong River Basin, susceptible to more extreme weather events due to climate change. This involves putting in place operating mechanisms for (cascading) dams and other water infrastructure to manage river flows within acceptable bounds and passing sediments towards the Mekong Delta, as well as the management of emergencies based on gender and vulnerability-sensitive communication mechanisms and response action plans;
- **Modernisation of data and information acquisition, processing and sharing** by consolidating and modernizing the current fragmented water-related monitoring, modelling and information systems to a level that is fit-for-purpose for proactive regional planning and coordination of basin operations, and getting information to key stakeholders and the public. This involves *inter alia* the establishment of a core river monitoring network managed by the MRC, as well as the enhancement of the MRC DSF and development of compatible DSS platforms in the region to support implementation of all river basin management functions;
- **More integrated entire river basin information management system** including by setting up joint basin expert groups (building on the existing expert groups of the MRC Member Countries) to oversee and direct the work streams in the above areas, and by increasing data sharing and cooperation the MRC and MLC Water, and other initiatives such as the Mekong Water Data Initiative.

All of these developments will lead inevitably to higher levels of transboundary cooperation and regional integration, which will advance the Association of Southeast Asian Nations (ASEAN) community building objectives.

Sustainable development opportunities

Compared to previous editions of the Strategy, this BDS 2021–2030 updates and broadens the sustainable development opportunities with environmental and social investment opportunities to include:

- **Hydropower development** to promote energy security and cross-border trade, and contribute to flood and drought management and a low-carbon economy;
- **Irrigated and climate-smart agriculture development** to improve efficiency, increase resilience against drought and improve household food and water security needs;
- **Navigation development** as an integrated, effective, safe and environmentally friendly way to move people and goods;
- **Leveraging the value from regionally significant environmental assets** to rehabilitate forested areas in watersheds and preserve, restore and leverage the remaining wetlands and riverine habitats;
- **Flood and drought mitigation** as a development opportunity in its own right or as part of other water sector investments;
- **Sustainable livelihoods** to reduce inequities and achieve greater social inclusion of vulnerable communities in conjunction with joint and significant national projects;
- **Fisheries and aquatic resources** including fish stock enhancement and sustainable aquaculture to support food security.

In all these sectors, this strategy promotes the development of joint investment projects between two or more countries and significant national projects that create benefits within the country as well as opportunities elsewhere in the basin. This includes (multi-purpose) storage-backed hydropower projects, transnational parks, watershed restoration and management projects, the preservation of wetlands and riverine habitats, floodwater management projects, river training and navigation safety, and projects based on new technology (such as floating solar on hydropower reservoirs).

Guidance and conditions for capitalizing on the above opportunities have been broadened compared to previous editions of the BDS. For example, to enhance sustainable development, any new power generation plans should consider the full range of viable generation sources and related opportunities for equitable socioeconomic development, including complementary use of wind and solar, and ensure that supply does not run too far ahead of demand. Potential transboundary impacts will need to be identified and mitigated collaboratively through national regulatory frameworks, as well as applicable regional procedures and guidelines.

Strategic priorities

This BDS 2021–2030 is guided by the basin vision towards 2040 of: **An economically prosperous, socially just, environmentally sound, and climate resilient** Mekong River Basin. The narrative of the basin vision reflects the equal importance of each dimension in support of peace, security, and societal well-being.

As the BDS aims to put actions in place to improve the overall state of the Mekong River Basin, the result chain of the BDS, and the corresponding MRC Strategic Plan, is formulated in accordance with the five dimensions of the SOBR and indicators of the MRB-IF, and relevant targets of the SDGs. The **five Strategic Priorities**, one for each dimension of the MRB-IF, are identified to direct the realisation of **11 BDS Outcomes** and **30 Outputs** by 2030 (Figure E2). These strategic priorities are:

1. **Environment:** Maintain the ecological function of the Mekong River Basin
2. **Social:** Enable inclusive access and utilisation of the basin's water and related resources
3. **Economic:** Enhance optimal and sustainable development of water and related sectors
4. **Climate change:** Strengthen resilience against climate risks, extreme floods and droughts
5. **Cooperation:** Strengthen cooperation among all basin countries and stakeholders

Maintaining the ecological function of the Mekong River Basin requires a focus at both national and regional levels on limiting the modification of the flow regime and arresting the decline in wetlands to achieve an acceptable balance between ecological function, economic development and climate resilience. The management of watersheds needs to be improved and reductions in sediment transport mitigated through operational coordination of dams and the improved management of sediment extraction.

The inclusive access and utilisation of the basin's water and related resources requires access and supply of safe water and sanitation for those in vulnerable situations, effective regulatory frameworks for capture fisheries and mitigation measures to enable ongoing fish passage, and the identification and support for alternative livelihoods, including through joint projects that help reduce inequities. A focus on collecting and reporting data on gender and other aspects of vulnerability, and their systematic consideration in joint planning and monitoring, will provide a basis for policy responses that help support less direct dependence of vulnerable people on river and wetland resources.

Optimal and sustainable socio-economic development will be supported by a more proactive approach to regional planning that evaluates alternative development scenarios, maps out vulnerabilities and supports the identification and implementation of new joint investment projects and national projects of basin-wide significance. Regional sectoral strategies will need to be implemented in a coordinated way amongst various cooperation mechanisms and support efforts to increase regional benefits and decrease regional costs.

Adapting to climate change requires a focus on enhancing water security as it relates to floods and droughts, ensuring enough water in the dry season to support productive uses and mitigate salinity intrusion in the delta, and a reduction of flood peaks in the wet season. This will require more comprehensive basin monitoring, data and information sharing, enhanced modelling and analysis, improved basin-wide forecasting and early warning capabilities, the increase in natural and constructed water storages, coordination of dam operations, coordinated floodwater management, and the mainstreaming of adaptation measures throughout national water-related sector plans.

Cooperation between all six basin countries is critical to the success of this BDS 2021–2030. Areas of cooperation that will be strengthened are: (i) on data and information sharing, (ii) on the potential future institutional arrangements for basin management; (iii) on the strengthening of the MRC; and (iv) on coordination among all regional mechanisms, partners and stakeholders that work on water resources management to ensure focused and complementary efforts.

Achieving Outcomes in one dimension requires Outputs to be delivered across multiple dimensions. For instance, adapting to climate change by ensuring water security in relation to floods and droughts cannot be achieved without the proactive regional planning and project investment that contributes to socio-economic development. Achieving optimal and sustainable development cannot be achieved without measures taken to protect and enhance environmental and social conditions. Almost all Outputs have links to multiple Outcomes and must be addressed in synergy with related Outputs.



Figure E2. Overview of the Basin Development Plan results chain including the Vision, relevant SDGs, Strategic Priorities, Basin Outcomes, and the key Outputs that will contribute to the Outcomes

Implementation and funding

Identified and agreed development opportunities will be implemented through national and local agencies and organisations, and through the private sector, based on national regulatory frameworks and guidelines, as well as applicable regional procedures and guidelines, including meaningful public participation and consultation with civil society and affected groups. The basin countries' water cooperation platforms will continue to promote and help coordinate sustainable development opportunities. They will also identify significant joint investment projects and national projects of basin-wide significance through the assessment of a few alternative basin-wide development scenarios.

The BDS Outcomes in the strategic priority areas will be addressed by the basin countries' regional organizations, initiatives and programmes in collaboration with relevant counterpart organizations, such a national line and implementing agencies, scientific and advisory institutes, civil society organisations and others. The MRC will coordinate BDS implementation and deliver many of the BDS Outputs in the BDS results chain, many in cooperation with other regional cooperation mechanisms. Therefore, the MRC has integrated its Strategic Plan for 2021–2025 with the BDS 2021–2030 and attached to this document.

Joint basin expert groups should be established by the six countries, building on existing expert groups, to contribute to technical work that can only be effectively realized by participation of all countries: proactive planning, integrated monitoring/information systems, and coordination of basin operations. Initially, the expert groups will promote basin-wide coherence in approaches and technology, ensure results and services respond to national and regional needs, and assist in the uptake and use of the results in the national planning and management systems. With time, the joint basin expert groups (and their national agencies) will take over many activities that are currently dependent on consultants and the financial support of development partners.

Financing of development opportunities. Most of the identified and agreed developments will be largely financed by the private sector, supplemented by national public budgets and international and regional loans. There will be opportunities for creating added value for water resource management (such as monitoring and data sharing) by improving private sector concessions and contracts. There will be opportunities also to benefit from innovative financing arrangements, such as attracting foreign carbon offsetting funds for reforestation of watersheds.

Funding of strategic priorities. The total estimated costs of the regional enabling Outputs and activities (studies, assessments, planning) and transboundary non-structural investments (equipment, monitoring facilities) is in the range of USD 100 to 150 million during 2021–2030. It is expected that these costs can be funded through international

and regional grants, supplemented by national public budgets. Opportunities for a regional Mekong Fund will be explored to attract funding from multiple sources and in all development sectors to finance identified (joint) social and environmental investment and adaptation opportunities of transboundary significance, as well as water-related disaster recovery.

Active, open and transparent stakeholder engagement is essential to realize the Outcomes of this Strategy. Fortunately, there is a common interest from stakeholder groups throughout the basin to engage in proactive regional planning and coordinated basin management operations. Thus, this Strategy promotes the ‘institutionalization’ of a Multiple Stakeholder Platform with the mandate to undertake regular stakeholder reviews of the implementation of the Strategy at the regional and national levels. The Platform provides an opportunity to streamline and synergize Mekong water-related stakeholder forums to maximize stakeholder inputs, reduce stakeholder engagement fatigue, and achieve common objectives of sustainable development of the Mekong River Basin.

Risk management

The overarching risk to Strategy implementation is trust issues between the basin countries and between their regional water cooperation platforms. There is no easy remedy for insufficient trust: it comes with regional (economic) integration to which this Strategy contributes. Much depends on the political commitment of the basin countries and the technical and diplomatic skills of the leadership within the MRC, MLC, ASEAN and other Mekong frameworks to drive a practical process towards achieving this Strategy’s aims.

The main challenges that are identified are related to further institutional alignment at the basin level for the sustainable management of the basin’s water resources, to address the uneven distribution of knowledge and capacity between countries, and continue to build trust and confidence in the added-value of basin-wide cooperative action for each country. Different capacity among basin countries provides an opportunity for greater use of country-to-country knowledge sharing and capacity building using a mix of mechanisms, including secondments and temporary transfers of experts.

The immediate economic circumstances are highly uncertain. The global economic impact of COVID-19 will be severe and likely to have ripple effects at least throughout the initial BDS implementation period. These effects may have implications for the viability of planned investments in water resources development and the relative value of different energy generation and food production options. Policy measures aimed at a rapid return to growth have the potential to exacerbate inequalities and environmental degradation, but the situation also offers scope for new thinking and the reinvigoration of a more integrated water resources management – basin-scale and multi-sectoral.

Monitoring, evaluation and reporting

An integrated monitoring, evaluation and reporting system (MRC's state of basin monitoring system) has been established to track the implementation of the BDS 2021–2030. The system will have a practical dashboard to provide planners, decision makers, funders and other stakeholders with: (a) information about the overall health of the Mekong River Basin in five dimensions (environment, social, economic, climate and cooperation); (b) status and trends on key indicators that the BDS Outcomes and Outputs are trying to address, such as water flow and quality, food security, value of water sectors, climate resilience, and cooperation value and benefits; and (c) the contributions that are being made to the relevant SDG targets (Figure E.3).

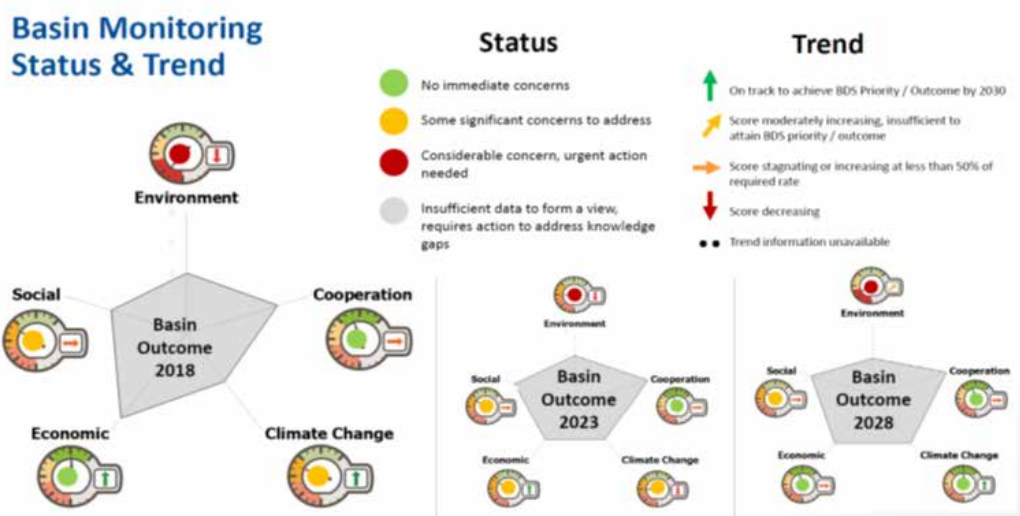


Figure E3. Sample representation of the MRC's dashboard for monitoring the status and trends in conditions across the basin

MRC Strategic Plan

Based on implementation experiences during 2016–2020, the MRC has integrated its Strategic Plan (MRC SP) for 2021–2025 with the BDS 2021–2030 and incorporated it within this document (Chapters 7-9). The MRC SP sets out how the MRC will:

- **Contribute to the implementation of the BDS** by (i) delivering or contributing to 28 of the 30 BDS Outputs in all five strategic priority areas, several in cooperation with other regional cooperation mechanisms, (ii) maintaining adequate levels of coordination and cooperation with other regional cooperation mechanisms, and (iii) monitoring progress to achieving BDS Outputs and Outcomes;
- **Strengthen the MRC as an organisation** to enable increased cooperation with China and Myanmar and other partners for the purposes of integrated management of the whole Mekong River system by 2030, ensuring an integrated whole-of-basin monitoring network, the adequate sharing of data and information, joint studies and assessments, and common state of basin reporting and BDS;
- **Support increasing national implementation** of CRBMFs and the transition towards regional planning and management processes that are embedded in national planning, decision-making and governance systems by 2030, and funded by the basin countries.

The MRC contributes to the achievement of the 28 Outputs by undertaking its CRBMFs which frame the comparative advantage of the MRC vis-à-vis other cooperation mechanisms. In total 95 routine and non-routine CRBMF activities are deemed necessary to achieve the 28 Outputs. The table below shows the alignment of some major activities led by the MRC with the five main CRBMFs.

Table E2. Major activities taken against five core river basin management functions

Selected major activities led by the MRC	Main CRBMF required for each activity
Implement river monitoring, analysis and reporting on conditions and trends	CRBMF1: Data acquisition, exchange and monitoring
Implement and enhance partnership agreements, including for year-round data sharing on river flows and dam operations	

Identify and assess limits to adequately protect key regional environmental assets, incl. Tonle Sap lake	CRBMF2: Analysis, modelling and assessment
Undertake a study on gender and vulnerability and identify future data and mapping requirements	
Prepare a basin-wide sediment management plan	CRBMF3: Planning Support
Assess agreed alternative basin-wide development scenarios	
Implement improved and integrated flood and drought forecasting and early warning to basin countries	CRBMF4: Forecasting, warning, and emergency response
Implement the PNPCA taking into account updated technical guidelines and those for other Procedures	CRBMF5: Implementing MRC Procedures

A responsive and balanced Strategic Plan. The identified 95 activities encompass all Articles under the *1995 Mekong Agreement*. The activities also align with the key directions of the MRC Summits of 2010, 2014 as well as 2018, such as: balancing of development and environmental protection; strengthening of the knowledge base; MRC reforms and decentralisation; protection of livelihoods and river ecology; integration of climate change adaptation; comprehensive cooperation and data and information exchange between the Upper and Lower Mekong; a whole of basin approach in planning and management; addressing trade-offs, benefit sharing and risks; and enhancing regional cooperation. Since many of the 95 activities are inter-dependent, they are well balanced between the environment, social, economic, climate change, and cooperation priorities of the results chain.

Response to COVID-19. This MRC SP supports the recovery from COVID-19 and builds the resilience of communities for possible similar disease outbreaks through measures supporting economic development, strengthening water security, improving food security, enhancing regional cooperation and trust, supporting vulnerable populations, and mitigating the risk of future novel zoonotic virus outbreaks.

MRC SP implementation. The 5-year MRC SP serves as a macro-level planning tool for the MRC, which will be operationalised through rolling two-year work plans. The latter will show continuation of work, especially activities that run over several years, which will help national line/implementing agencies integrating MRC activities in their annual

workplans for better national implementation. The multi-year work plans will maximize the engagement of line/implementing agencies and their expert groups to ensure national uptake of regional products. The delivery of work packages will be distributed among MRC organisational units, with collaboration by others. The implementation of the work packages will be managed and overseen in accordance with the updated MRC operational manuals.

National uptake of Outputs. For the delivery of each Output, an ‘impact pathway’ has been defined from the implementation of the first activity to the last, to ensure that the final products, facilities and services respond to needs and will be taken up and used by the responsible national line and implementing agencies, and their regional cooperation mechanisms. The impact pathways will be integrated in MRC’s multi-year work planning, NIP preparation, and MRC’s organizational monitoring and evaluation system. The impact pathway approach will be used also to improve uptake of existing regional products developed over recent years in the national planning, decision-making and management systems.

Capacity building for national implementation. A tailor-made consultation and capacity building plan will be aligned to each Output in order to build national capacity for regional planning and management processes and to facilitate uptake of the final Outputs. Guidelines will be prepared for integrating regional planning and management processes in national planning and governance systems, and for creating staff time in the annual workplans and staffing plans of national line/implementing agencies for participation in joint basin expert groups and contributing to the regional planning and management work.

The MRC will mainstream stakeholder engagement in MRC SP implementation, based on the presented matrix of the interests of stakeholders and the engagement purpose of the MRC. The MRC will take a leading role in the development of the Multiple Stakeholder Platform with and in consultation with all other relevant partners.

The MRC SP sets out risk management tactics for managing basin-wide risks, as identified in the BDS, and organisational risks specific to the MRC. The resulting risk management matrix shows how the risk management tactics and measures are integrated in the MRC SP results chain. Once a year, MRCS will review and update the risk management matrix, and report the results to the MRC governance bodies.

The total cost of MRC SP implementation amounts to around USD 60 million, to be funded by the Member Countries and Development Partners. The cost is made up of operations (including staff and administrative services) and strategic and technical activities under both routine and non-routine CRBMFs. A large proportion of the CRBMF budget will contribute to recovery efforts from the COVID-19 pandemic and help prepare for and mitigate the risk of future disease outbreaks. In case of significant unexpected funding

shortfalls, Outputs and activities will be prioritized in the multi-year work planning process based on criteria agreed by all Member Countries.

Monitoring, evaluation and reporting. The MRC's organizational monitoring and evaluation system monitors implementation of the Strategic Plan in terms of inputs, activities, key deliverables, financial status, and Output indicators for each BDS Output that the MRC contributes to. Mid-year and Annual reports communicate the results of this monitoring to stakeholders. Independent mid-term and final evaluations are scheduled for the implementation of the Strategic Plan in its entirety.





PART

1



BASIN DEVELOPMENT STRATEGY

INTRODUCTION

1.1 Purpose and scope of the strategy

This Integrated Water Resources Management (IWRM)-based BDS sets out how water and related resources of the Mekong River Basin³ should be utilised, managed and conserved over the period 2021–2030 from the perspectives of the LMB countries of Cambodia, Lao PDR, Thailand and Viet Nam, in-line with their commitment to the *Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin (the 1995 Mekong Agreement)*.



The 1995 Mekong Agreement

establishes the goals, objectives and underlying principles by which the four Member Countries intend to cooperate, and to which this Strategy responds. These may be summarised as:

- ◆ To cooperate in all fields of sustainable development, utilisation, management and conservation of the water and related resources of the Mekong River Basin, in a manner to optimise multiple uses and mutual benefits ... including, but not limited to irrigation, hydro-power, navigation, flood control, fisheries, timber floating, recreation and tourism (Article 1);
- ◆ To promote the development of the full potential of sustainable benefits and to prevent wasteful use with an emphasis and preference on joint and/or basin-wide development projects and basin programs through the formulation of a basin development plan (Article 2);
- ◆ To protect the environment, natural resources, aquatic life and conditions, and ecological balance (Articles 3 and 7-10);
- ◆ To utilize the waters of the Mekong River system in a reasonable and equitable manner (Articles 4-6).



³ In the MRC context, Mekong River Basin refers to the whole river basin from source to sea and is divided into Upper Mekong, called Lancang in China, and Lower Mekong. In the context of cooperation with China, the whole river is often referred to as the “Lancang-Mekong River”.

The BDS is a basin-wide strategy whose main purpose is to guide all actors involved in Mekong water-related issues towards achieving improvements in the environmental, social and economic state of the Mekong River Basin, which is periodically recorded in the SOBR. The BDS uses the SOBR to identify the key issues faced by basin countries in developing and managing the water and related resources and sets out the way in which the countries agree to cooperatively address these issues in order to promote the sustainable development of the basin in-line with the aims and intent of the *1995 Mekong Agreement*.

The Strategy contributes to a wider adaptive planning process linking regional and national plans towards realising the common vision of an *economically prosperous, socially just, environmentally sound, and climate resilient* Mekong River Basin. The Strategy provides an integrated basin perspective for enhancing national plans and projects to ensure an acceptable balance between economic, social and environment outcomes, with benefits to all basin countries and peoples.

Unlike previous editions with a timeframe of five years, the BDS 2021–2030 is prepared and agreed for a ten-year period. In addition to articulating the vision toward 2040, the Strategy:

- aligns cooperative basin management and development to contribute to the achievement of the United Nations **SDGs** by 2030;
- outlines **opportunities** to promote sustainable development and strengthen operational management in the basin, and thereby increase regional and national benefits;
- sets medium term **strategic priorities** for all relevant actors in the basin to strengthen basin management and ensure implementation of the opportunities will contribute to optimal and sustainable development pathways;
- defines **Outcomes** and **Outputs** towards 2030 to address the basin-wide strategic priorities.

The BDS 2021–2030 is prepared under the framework of the MRC cooperation, with engagement of all basin countries and relevant regional cooperation mechanisms. Unlike previous editions, greater emphasis of the Strategy is on the actions needed for the entire Mekong River Basin, since the current water security issues can be addressed effectively only at the basin scale through cooperation between all six basin countries and their cooperative bodies. The Strategy covers all water and related sectors.

The Strategy highlights the cooperation that is needed with the Mekong-Lancang Cooperation (MLC)⁴ water priority area. The MLC Water platform facilitates cooperation among all six riparian countries (including China and Myanmar, which are longstanding MRC Dialogue Partners) on water resources management and development, including but not limited to the Mekong River Basin (see Section 2.5). Although MRC has always aimed at whole-of-basin cooperation, the emergence of MLC Water is an opportunity to more effectively implement the strategic directions in this Strategy (proactive regional planning and operational basin management, supported by whole-of-basin monitoring and data and information sharing).

The BDS 2021–2030 is designed for implementation by all national and regional stakeholders, including government agencies, private developers, regional mechanisms and organisations (through their own strategies, plans and programmes), development partners, scientific and advisory institutes, civil society organisations and others. The MRC will implement a substantial part of the Strategy’s strategic priorities itself through its five-year Strategic Plan and, consistent with its coordination role, promote and track implementation of the remainder by the other actors as described in Chapter 6.

1.2 Need for strategy updating

By global standards, the Mekong River is both of great importance and challenge to manage due to its highly variable inter- and intra-annual flow and its transboundary nature. This challenging context creates both risks and opportunities, and the risks are growing as populations and economies grow and as the climate changes. Assessing and mitigating the risks requires early and joint action, as solutions will become much more difficult and costly over time with uncoordinated development that does not optimise regional benefits and minimise regional costs.

The previous BDS for 2016–2020 set strategic priorities to capture water resources development opportunities and manage the risks of national ongoing and planned developments. These cross-cutting priorities are still largely relevant, but the Strategy is updated herein considering major changes in the basin over recent years as described in the 2018 SOBR and Mid-Term Review of the previous MRC Strategic Plan:

- **The natural flow regime of the Mekong has changed** as a result of the hydropower dams constructed on the mainstream in the Upper Mekong River Basin and on tributaries in the LMB (and other factors)⁵ yielding both opportunities and risks.

4 Mekong Lancang Cooperation (MLC) is used here and is interchangeable with the Lancang Mekong Cooperation (LMC).

5 The impact of climate change on the flow regime is uncertain but may also be having an impact (see SOBR 2018, Chapter 8, among others).

The construction of the first two dams on the mainstream in the LMB is also now complete and others are progressing through the planning process;

- **Floodplains are being developed** and flood protection and river training are being taken up at many locations along the mainstream and in the Mekong delta for urbanisation, industrialisation and full-year irrigation. Industrial activities such as sediment extraction from river channels are increasing;
- **The potential for water-related emergency situations is increasing**, including from dam breaks, sudden water level changes, and water quality incidents from increased navigation, development pressures and climate change. Natural disasters, such as flood and droughts, could become more frequent and severe in the future;
- **Developments outside the water sector** are impacting water related resources. These include the construction of (international) roads, railways and power transmission infrastructure, the development of non-irrigated agriculture and mining activities, as well as deforestation and urbanisation;
- **There are new regional actors**, including the Mekong-Lancang Cooperation, with a mandate, *inter alia*, for water resources development and management, and an ASEAN increasingly focused on water-related disasters (see Table 6.1), leading to new relationships for managing the Mekong;
- **Broader societal and economic developments**, including decreasing poverty, increasing regional integration, technological advances (e.g. in earth observation and new energy options), and a common focus on the 17 United Nations SDGs are bringing new opportunities and challenges for all countries.

Recent assessments of future development scenarios have confirmed that nationally planned development is sub-optimal from a basin-wide perspective. The plans create large national economic benefits, particularly in the hydropower sector, but they also create impacts and risks at the basin level, including falling short in protecting key environmental assets and millions of people against major floods and droughts. Furthermore, the benefits, impacts and risks from basin development are generally not viewed as equitably distributed. The siting and design of some of the hydropower and other infrastructure projects that are progressing could prevent implementation of the joint investment projects needed to increase water security and help achieve the mutually beneficial basin vision.

A sense of urgency is growing among stakeholders on the need to move basin development towards more “optimal” and sustainable outcomes that address long-term needs, including food, water and energy security. This requires increased levels of regional cooperation and integration. Experience from other regions suggests that joint management and development projects will be necessary if the people of the Mekong region are to transition to middle/high income status in a manner that is in long-term

balance with the basin's ecosystems. The significant investment in data and knowledge under the Mekong cooperation of the past sixty years makes the Mekong River Basin more prepared than most basins that have reached such agreements.

The updated Strategy for 2021–2030 addresses these pressing issues and takes regional cooperation a step further towards:

- **More proactive regional planning**, which involves moving beyond the set of infrastructure projects that the basin countries are currently planning to identify new projects for consideration by countries in future updates to national plans that could increase synergies and reduce trade-offs and vulnerabilities at both the basin and national levels, and provide a comprehensive response to climate change and related water security challenges;
- **Coordination of basin operational management**, including coordination of operations of dams and other water infrastructure where there may be transboundary effects, including for river flow management, sediment management, ecosystem services, management of emergencies, and coordination of the design and management of hydropower cascades;
- **Modernisation of data and information acquisition, processing and sharing** by consolidating and upgrading water-related monitoring, data/information management, and modelling and information systems to a level and disaggregation that is fit-for-purpose for proactive regional planning and operational basin management, and getting information and knowledge to key stakeholders and the public;
- **More integrated Mekong-Lancang management arrangements** including by setting up joint basin expert groups to oversee and direct the work streams in the above areas, and by increasing data sharing and cooperation between the two regional water cooperation platforms: MRC and MLC Water.

Accordingly, the implementation of this Strategy during 2021–2030 is intended to move all parties from reactive regional planning and piecemeal approach to basin operational management by individual countries. By 2030, which coincides with the objective for self-financing of the MRC and the targets for achievement of the SDGs, the management of the Mekong River Basin will need to match the needs of a fast-developing Mekong region.

1.3 Approach to strategy updating

This BDS for 2021–2030 is based on the findings of a range of basin-wide assessments, reviews and studies. The resulting Strategy aligns with the Siem Reap Declaration of the

Third MRC Summit “One Mekong One Spirit” on 5 April 2018 (see Box 1), as well as the Phnom Penh Declaration of the Second Mekong-Lancang Cooperation Leaders’ Meeting “Our River of Peace and Sustainable Development” on 10 January 2018 and the Five-Year Action Plan on Lancang-Mekong Water Resources Cooperation (2018-2022).

“

BOX 1.

Declaration of the Third MRC Summit: Priority areas for action

- ❑ Optimize development opportunities and address challenges through a basin-wide, integrated and inclusive multi-disciplinary process
- ❑ Consider the key findings of the Council Study to capture development opportunities and address trade-offs, benefit sharing and risks
- ❑ Continue to improve the dissemination, uptake, and use of MRC products by relevant line agencies and organizations
- ❑ Continue the momentum in implementing MRC Procedures
- ❑ Strengthen basin-wide monitoring networks and forecasting systems for floods and droughts, and the related data and information management systems
- ❑ Implement the BDS, SP and NIPs with greater efforts focussing on joint projects and the implementation of the decentralization roadmap
- ❑ Identify and implement opportunities for further cooperation with Dialogue Partners, Development Partners and other partners
- ❑ Concrete cooperation should be pursued with ASEAN, Mekong-Lancang Cooperation, and Greater Mekong Sub-region towards a shared future

”

The BDS is also guided by the directives of the First MRC Summit “Meeting the Needs, Keeping the Balance” held on 5 April 2010 in Hua Hin (Thailand), which acknowledged that development of water and related resources would make a significant contribution to the socio-economic development of the region, but there needs to be social and environmental protection as well. At the Second MRC Summit, held on 5 April 2014 in Ho Chi Minh City (Viet Nam), the Heads of Governments reaffirmed their commitment to implement the *1995 Mekong Agreement, consolidate the spirit of Mekong cooperation, and address climate change (see also Section 7.2)*.

This BDS recognizes that sustainable development in the basin depends on equitable access and utilization of resources, social equity, the resilience of the basin population

and the continued function of the Mekong ecosystem, and that economic development as well as targeted policies and actions are necessary to address inequity. The strategy therefore recognizes a “gender and vulnerability” approach to account for intersectional inequity, the need to internalise the costs of externalities, and the different dimensions of vulnerability. This approach focuses initially on spatially and gender disaggregated data collection to identify and map poor water-related resource users and to determine how they are impacted, where vulnerabilities lie, and what the opportunities are to improve resilience.

The Strategy updating forms a key step in the implementation of the strategic planning cycle facilitated by the MRC (Figure 1.1). The updated Strategy builds on the experience gained during the preparation and implementation of the BDS 2016–2020, and further considers:

- The progress made in implementing the strategic priorities of BDS 2016–2020 and lessons learned (see Section 1.4);
- The 2018 SOBR, which identifies the key issues the BDS should address and measures the effectiveness of its implementation (Chapter 3);
- The national perspectives of basin countries and regional perspectives of relevant regional organisations (see Chapters 4 and 5);
- Changes in national plans for the development and management of water related resources (Section 2.4);
- Recent scenario assessments, including the Council Study,⁶ which provides an outlook to future benefits, impacts and risks of current national plans (Chapter 3);
- Regional or basin-wide sector strategies for hydropower, navigation, environment, fisheries, climate change adaptation, drought management, and studies on flood risk reduction in the delta;
- A review of water-related strategies and plans of regional organizations, initiatives and programmes, and the mapping of priority areas relevant to achieving the Outcomes of the BDS (Section 2.5 and 6.2).

6 The Council Study is a product of the MRC Secretariat through an extensive process of consultation with representatives of the Member Countries and interested stakeholders. The contents, findings and recommendations serve as knowledge base and reference for the work of the MRC and its Member Countries in their ongoing technical and policy dialogues to ensure sustainable development of the Mekong River Basin, as declared in the Siem Reap Declaration. Findings can and will be updated when new knowledge becomes available.

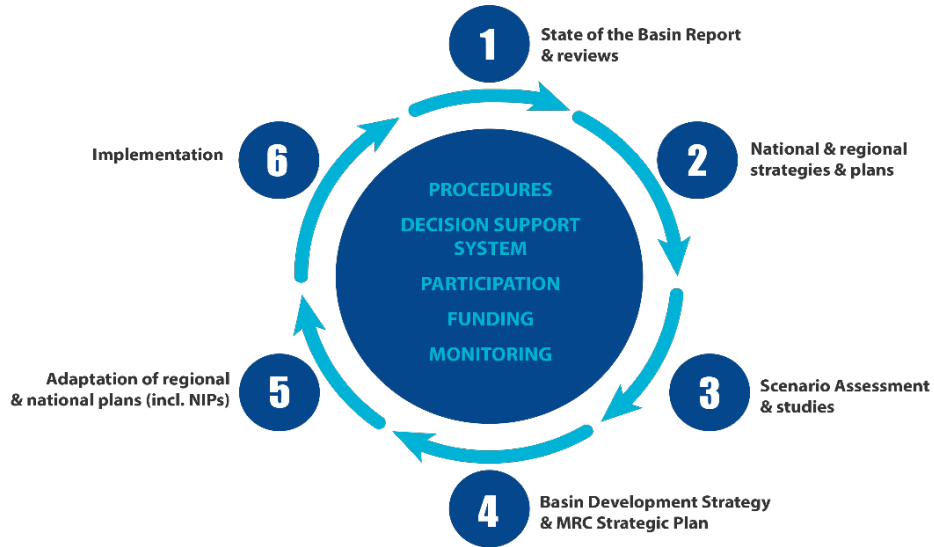


Figure 1.1. Mekong Basin strategic planning cycle

This Strategy has been prepared with contributions and reviews from each MRC Member Country’s National Mekong Committee Secretariat (NMCS) and national line/implementing agencies; and engagement of MRC Dialogue Partners (China and Myanmar); MLC Water; relevant regional organizations, initiatives and programmes such as ASEAN, GMS and others; private sector and development partners; and broader stakeholders including civil society organizations. The final version of the updated BDS has been agreed by senior government officials from the Member Countries prior to consideration and approval by the Ministers in the MRC Council on behalf of their respective Governments.

1.4 Implementation of the strategy 2016–2020 and lessons learnt

The BDS 2016–2020 comprised development opportunities, seven strategic priorities (see Box 2), and 37 strategic actions. The development opportunities are being implemented by the basin countries through their national sector plans. Since 2016, several opportunities have moved from the planning to the implementation stage (see Section 2.2).



BOX 2.

The 2016–2020 strategic priorities

- ❑ Reduce remaining knowledge gaps to minimise risks
- ❑ Optimise basin-wide sustainable development and cost and benefit sharing
- ❑ Strengthen the protection of mutually agreed environmental assets
- ❑ Strengthen basin-wide procedures and national implementation capacity
- ❑ Improve national water resources development
- ❑ Enhance information management, communication and tools
- ❑ Increase cooperation with partners and stakeholders

The strategic actions under each of the seven strategic priorities were to be implemented at both regional and national levels through the MRC Strategic Plan 2016–2020 and the National Indicative Plans (NIPs) of the four Member Countries. A recent assessment in support of this Strategy demonstrated good progress in Strategic Priorities 4 and 7. National agencies, regional organizations, development partners and civil society organisations have all been promoting and practicing more regional water cooperation to ensure outcomes are maximized for the entire region and duplication of effort is minimized. MRC successfully led consultations on proposed mainstream dams under the PNPCA process, which resulted in agreement on significant design changes and joint action plans that are expected to reduce negative environmental and social impacts. Also, some major studies under priorities 2 and 6 were completed, such as the cumulative impact assessment of the national plans under the ‘Council Study’, preparation of regional sector strategies, and the 2018 SOBR. The Council Study has contributed to high-level awareness of the most least beneficial projects and their reconsideration.

Due to the restructuring, downsizing and decentralisation of MRC CRBMFs, a considerable part of the strategic actions will not be substantially completed by 2020. They are found particularly in the priority areas 3 and 5. Not enough results are seen from the MRC and other actors to strengthen the protection of environmental assets. Also, the impact of regional activities and products on national water resources development and management has been limited (although considerable information and guidance has been generated across various sectors). Finally, more progress is needed on the improvement of the region’s water-related monitoring and information systems, and the sharing of data

and information to those that need it most. Strategic actions that had not started, or will remain substantially incomplete, or might not be taken up at national or regional levels by the end of 2020, as well as actions that have ongoing relevance, are included in the results chain of this BDS 2021–2030.

The implementation of the BDS 2016–2020 resulted in a number of important lessons. They are summarised below and have been used to prepare this BDS for 2021–2030.

A focus on traditional basin planning is not sufficient. During 2016–2020, communities in various parts of the Mekong River Basin were confronted with unusual or rapidly changing flow conditions and water-related emergencies (including a dam breach). In most cases, it took too long for the national and regional water management agencies to clearly communicate to the public what was happening, how they were responding to the situation, and what the implications would be. With increasing development and erratic climate events, the number of water-related incidents is likely to rise. Since many incidents may have transboundary impacts, river basin coordinators (such as the MRC) will need to focus increasingly on coordination of management and operational issues, supplementing their conventional role in basin planning processes.

Reactive regional planning is likely to lead to sub-optimal outcomes. There can be large positive impacts associated with basin development decisions, but large costs and trade-offs as well. Reactive regional planning that only assesses the impact of existing national plans and recommends not implementing certain projects, rather than proactively offering a broader range of possible tributary and mainstream projects, is unlikely to be accepted by national governments. While the MRC has succeeded in working with countries to change the design of some infrastructure projects to minimize negative impacts, current national plans themselves have not been changed over several MRC planning cycles, even with increasing knowledge and awareness of their cumulative impacts. This is largely due to a failure to identify a regional plan capable of producing higher benefits and lower costs based on a comprehensive assessment of options. This has to change.

The scope of issues and challenges faced by basin countries is basin wide. The development of basin water resources is having increasingly evident transboundary effects. This is illustrated in rapid water level fluctuations, diminished sediment flows, and a change in the annual hydrograph. Future developments, including for flood and drought risk reduction, will further augment these changes. Managing these changes in the most effective way possible can only be done through cooperation between all six riparian countries, requiring a strategy applicable to the entire basin and to guide the actions of all relevant actors towards common goals.

Better use could be made of existing data. A substantial amount of data and information has been collected over many years by the Member Countries and the MRCS. However, the value of this data/information is limited without effective data management systems

and tools in place. A lack of integration and harmonisation between global, regional and national systems introduces inefficiencies and difficulty accessing data and information when it is needed. The application of modern technology is part of the solution.

An alternative approach to decentralised monitoring is necessary. The approach to the decentralisation of core river basin function monitoring activities over 2016–2020 focused on the handover of both the operational aspects of water-related data collection, processing and analysis, along with the financial responsibility for those activities to individual implementing agency budgets within Member Countries. This approach has been found to be unsustainable and requires a re-think. A better approach would involve the complete decentralisation of water-related data collection functions, while maintaining a regional approach to the management of a core monitoring network with financial support provided by the MRC, which is increasingly financed by Member Country contributions.

The strategies and action plans of all relevant actors need to be aligned to achieve the BDS Outcomes. To achieve the basin vision, all water resource management actors need to be working towards common objectives. Without this alignment, the BDS Outcomes can only ever be partially achieved. The MRC Strategic Plan 2021–2025 is therefore fully integrated through its results chain with the BDS and the impact pathway from Output to Outcome more fully described. The contribution to BDS Outcomes by other regional organizations and initiatives would also be more explicitly identified.

Need to inform the public in a timely manner. Unbalanced, biased and incorrect statements and journalism on water-related issues in social and other media are an increasing concern for the basin countries and the MRC. Misinformation is contributing to conflicting perceptions across stakeholder groups, feeding mistrust and affecting regional relations. To mitigate this situation, MRCS, in collaboration with key actors such as MLC Water and the basin countries, need to provide timely, factual, targeted, and even-handed information in traditional and social media, newspapers and other avenues on the actual situation in the basin, the causes of changes, and how they are responding to unusual water-related issues. This will also require the normalisation of greater public disclosure and increased transparency about further use and development of public assets.

Country-to-country capacity building could be improved. The capacity of some basin countries to effectively oversee the large-scale water infrastructure being developed and operated in their territories is limited. This capacity needs to be urgently developed to ensure effective oversight of operations so that infrastructure is in good condition when concession agreements come to an end (and loans are repaid) and greater economic benefits to the countries can be realised. There is also a need for increased capacity in planning and management of many water-related sectors, including on due diligence and risks. Different human and technical capacity among basin countries provides an opportunity for greater use of country-to-country knowledge sharing and capacity

building (through workshops, secondments and temporary transfers, and exchange visits) in addition to targeted international exposure of national agency staff.

Rethink the formulation and implementation of the NIPs. In 2011 and 2016, NIPs were formulated to support BDS implementation at the national level. The NIPs were seen as the primary channel by which basin perspectives, river basin management functions, sustainable development opportunities, and regional guidance and tools would be promoted and mainstreamed into the five-year national socio-economic and sector planning and annual work planning of relevant national agencies. This expectation has not been met. The formulated NIPs varied widely in terms of scope, budget, funding approaches, and ownership by national line agencies. Although there have been some implementation successes in bringing regional and national planning closer together, this Strategy recommends a rethink of the NIPs. The NIPs need to have a stronger focus on increasing regional benefits and reducing regional costs through follow-up actions from regional processes and outputs ('national uptake'), including guidelines, sector strategies, and identified (joint) infrastructure projects to build climate resilience and reduce flood and drought risks. Also, the NIPs should more directly support the implementation of regional water resources planning and management activities. All planned major infrastructure projects need to feature in the NIPs to facilitate more proactive regional planning and coordinated basin management operations. In addition, the NIPs need to be 'rolling' plans to better align with national planning and budgetary cycles and accommodate new regional and joint initiatives. Relevant development partners and regional cooperation mechanisms (such as MLC Water, ASEAN, and the like) should be engaged in the preparation of the NIPs for funding and alignment of projects.





WATER RESOURCES DEVELOPMENT AND MANAGEMENT

This chapter describes the current situation with water resources development and management in the Mekong River Basin. It illustrates that although consumptive use of the basin's water resources has so far been limited, water resources development is transforming the basin in many ways.

2.1 The Mekong River Basin

The Mekong River rises in the Himalayas at an elevation of about 5,000 m. It is the world's 12th longest river, flowing for almost 4,763 km through China, where it is known as the Lancang River, Myanmar, Lao PDR, Thailand, Cambodia and into the sea from Viet Nam (Figure 2.1). The Mekong has the world's 8th largest flow, with a mean annual discharge of approximately 446 km³, and its basin is the world's 21st largest by area, draining 810,000 km².⁷

The hydrology of the Basin is characterised by very high inter-annual variability, with discharge over the wet season on average 5-10 times greater than over the dry season (Figure 2.2). Snowmelt off the Tibetan Plateau dominates dry season discharge north of Vientiane. Between June and October, the Southwest Monsoon delivers a discharge pulse from the Mekong tributaries when the monsoonal winds meet the Annamite range along Lao PDR, Cambodia and Viet Nam. Along with tropical storms moving in from the sea, this can contribute to extensive flooding in parts of Lao PDR and in the Mekong Delta in Cambodia and Viet Nam. These wet season peak flows also cause the large flow reversal up the Tonle Sap River to the Great Lake in Cambodia, triggering fish movement and delivering a pulse of sediment and nutrients to the floodplain, which supports fish and other biodiversity, and enables recession rice agriculture around the lake.

This annual cycle of flooding is the basis of water resources productivity within the basin, benefiting the local inhabitants for centuries through abundant fisheries and fertile floodplains. The magnitude of the annual flood has led to the concept of 'living with floods' which recognises the valuable role flooding plays in the economy and society of the region, and the need to work in harmony with that cycle, while seeking to mitigate the destructive nature of the most extreme events.

7 The confirmed area of the basin and the average annual discharge were updated by MRC in SOBR 2018 based on analysis of recent data. The discharge value is subject to further change based on ongoing monitoring, analysis and review of basin conditions.

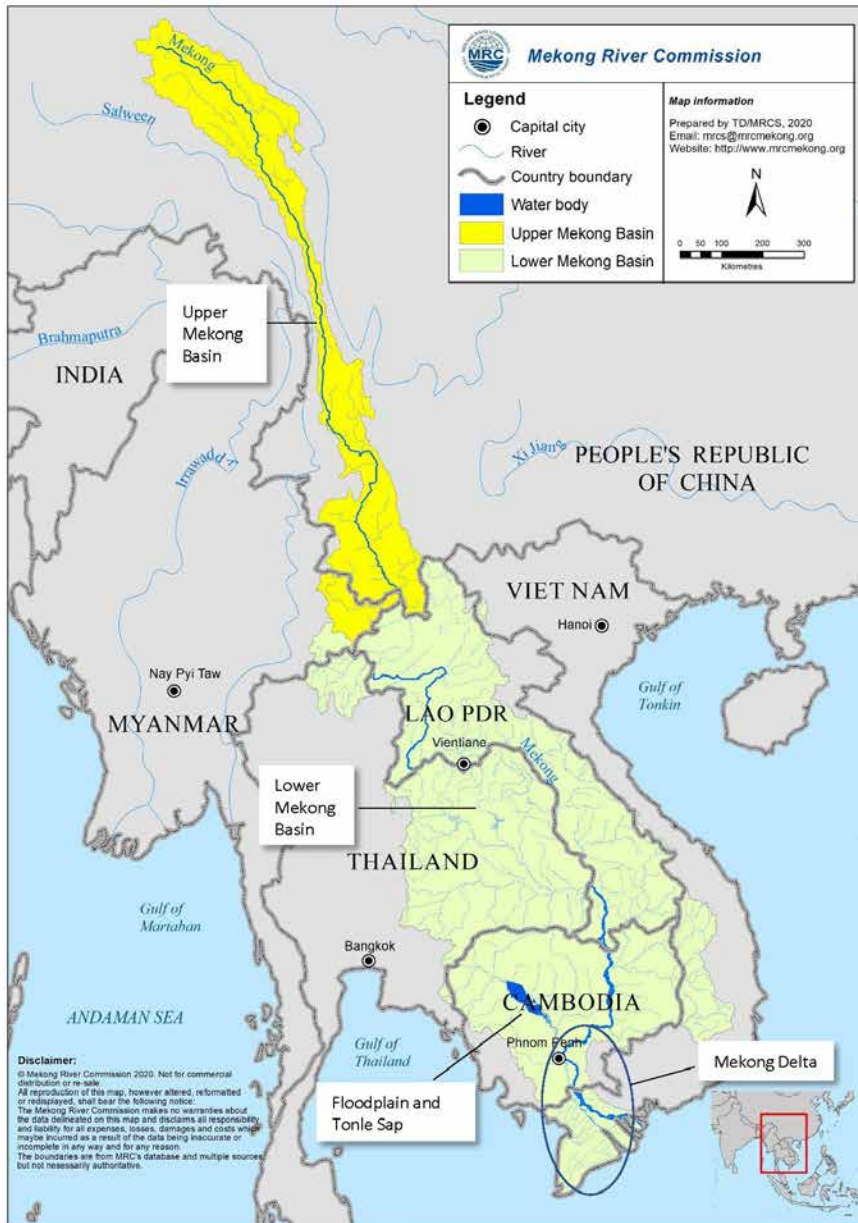


Figure 2.1. The Mekong River Basin

2.2 Water resources development

Around 12% of the average annual runoff of the Mekong River Basin is consumptively used before it reaches the sea, through water resources development including agricultural and urban uses. By 2040, this proportional use is projected to increase to around 15%.

While this proportion of consumptive use is relatively low compared to many other river basins around the world, the disparity in flow between the wet and dry seasons raises challenges for water resource development, particularly in terms of water security for agriculture and other human uses throughout the year and in different parts of the basin. Although there have been plans for capturing flows during the wet season and redistributing during the dry season for more than half a century, it is only relatively recently that countries in the region have invested in significant storage capacity in parts of the basin – in China through the development of the Lancang Hydropower cascade, notably Nuozhadu and Xiaowan dams on the mainstream, and with numerous other reservoirs on the tributaries of the Lower Mekong Basin and more recently on the mainstream.

The current level of active storage in the basin (Figure 2.3), at about 14% of mean annual runoff, is relatively low compared to many major rivers around the world. Based on current national plans it is forecast to increase to around 22%, offering the potential to support national irrigation and hydropower development plans and to help mitigate floods and droughts. Almost half of the current regulating capacity has been developed in China.

The water resources of the Mekong River Basin are on a rapid development trajectory. While development in some parts of the basin commenced more than a century ago, in other parts the exploitation of the water and related resources is more recent. As with many river basins around the world, development started from downstream (Figure 2.4).

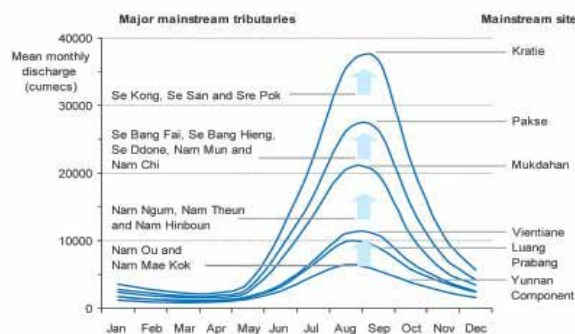


Figure 2.2. Mean monthly discharges at various sites on the mainstream and the major tributary sources in each reach

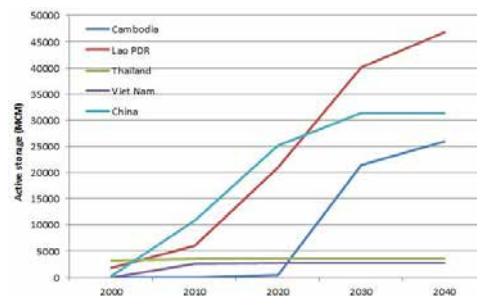


Figure 2.3. Trends and outlook for total active storage

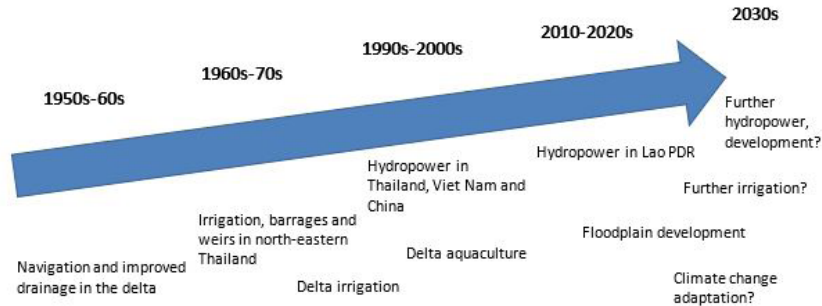


Figure 2.4. Illustration of basin development trajectory since the 1950s-60s to 2030 and beyond

Viet Nam first invested in navigation and improved drainage in the fertile Mekong Delta and by the 1960s began to construct intensive canal systems, pumps and other means of irrigating the floodplain. Its approach to agricultural development has been extraordinarily successful with the delta these days supporting three rice crops a year. The last 20 years or so have also seen substantial development of aquaculture ponds and the construction of 14 hydropower dams on tributaries in the Central Highlands.

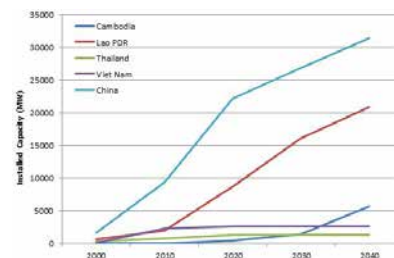


Figure 2.5. Trends and outlook for hydropower installed capacity

Thailand has long had a focus on improving water security in its north-eastern provinces with the construction of barrages and weirs and a number of irrigation dams and schemes within the Chi-Mun River basin and areas draining directly to the Mekong. In addition to rice, the paddy fields and connected canals and streams support a productive capture fisheries sector which helps to diversify income for much of the population. Thailand constructed seven hydropower projects on Mekong tributaries from the mid-1960s onwards, although only two with installed capacity of more than 100 MW. Thailand is currently focused on modernising and improving the efficiency of much of its existing water resources infrastructure. For example, by installing pump-back systems at Lam Takong and Chulaporn dams and floating solar panels at Sirindhorn reservoir.

Wars and political instability in the latter part of the 20th century meant that development in Cambodia and Lao PDR was delayed for several decades and is only now coming to fruition. Lao PDR has commenced construction of the lower Mekong hydropower cascade that was in the last basin plan of the Mekong Committee, the MRC's predecessor, including the recently built Xayaburi and Don Sahong. These dams are among more than

100 projects either built or planned on the tributaries and mainstream within Lao PDR which aim to help meet regional energy demand including through the development of a regional transmission grid. Following some recent safety incidents and dam breaches, Lao PDR, in cooperation with international partners, has reviewed all major dam construction plans and operations of existing dams as well as revised national dam safety guidelines to ensure safety and minimise the risk of further detrimental incidents.

Cambodia is also intensifying development of its water resources. This includes irrigation development, drainage works, and flood management around Tonle Sap and between Phnom Penh and the border with Viet Nam. Hydropower investments have been investigated on the mainstream and commenced in the tributaries, including the Lower Sesan II, built in the 3S basin.

China has constructed 11 hydropower dams (of which two are large storage dams) along the mainstream in the Upper Mekong with another 11, each greater than 100 MW, either being constructed or planned. The installed hydropower capacity on the Upper Mekong is 21,310 MW with the planned total rising to 31,605 MW.⁸ Only a small proportion of China's part of the Mekong River Basin is irrigated due to the narrow, steep sided gorges that dominate there.

The Myanmar portion of the Mekong River Basin is relatively undeveloped compared to the other countries. The first dam on its Mekong tributaries was commissioned in 2017 and there are plans for at least six more small storage dams. Less than 1,000 km² of Myanmar's basin area is currently irrigated.

In addition to hydropower, irrigation expansion is identified as a priority for some basin countries, and if current plans go ahead this will increase the demand for the basin's water resources. Despite this, there is potential for overall water security to improve because of higher dry season flows due to hydropower,⁹ depending on the operational management of the flow regime. These higher dry season flows are likely to occur even accounting for further irrigation development which could increase substantially in Cambodia, Lao PDR and Thailand based on current national plans. The situation in critical dry years, however, requires further analysis due to the potential for conflict between power generation and other needs.

⁸ Based on multiple sources (MRC recent studies and CGIAR WLE Greater Mekong, 2018, in MRC SOBR 2018, MRC hydropower database, and recent updated information of STIMSON Mekong Infrastructure Tracker)

⁹ This change in hydrology is already occurring, as presented in the SOBR 2018.

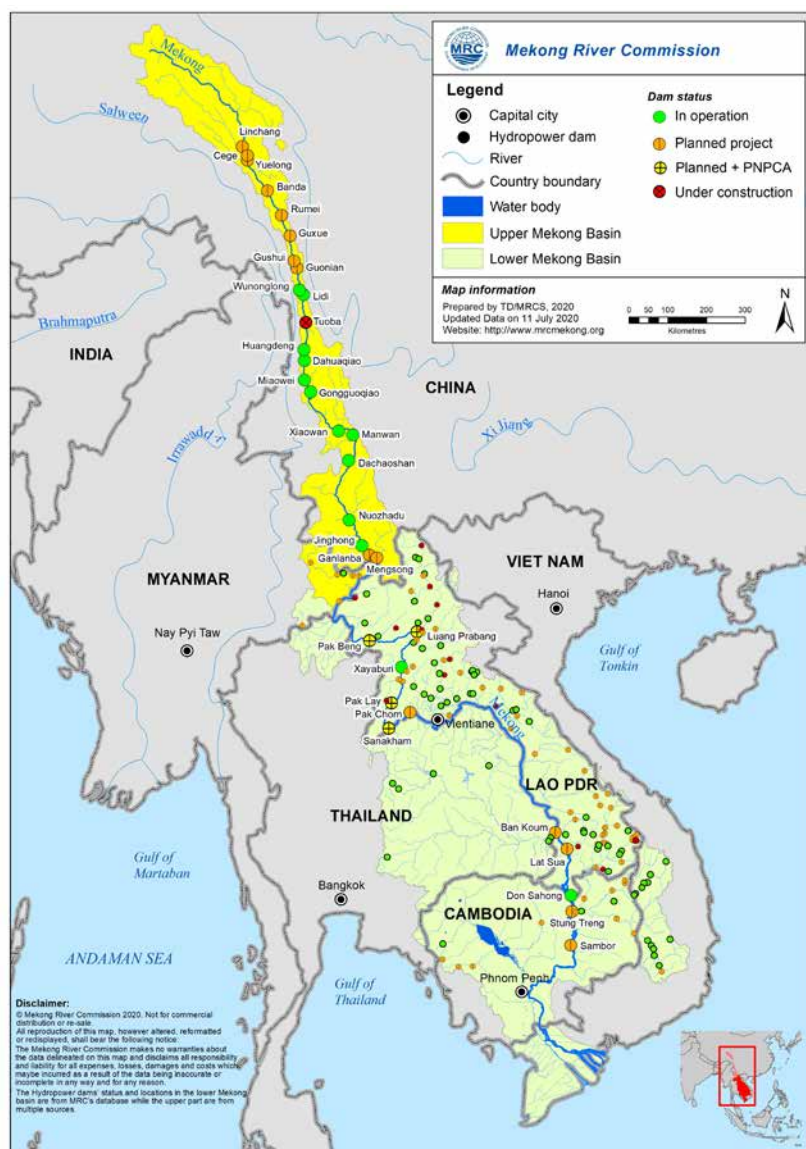


Figure 2.6. Current and planned hydropower development in the Mekong River Basin

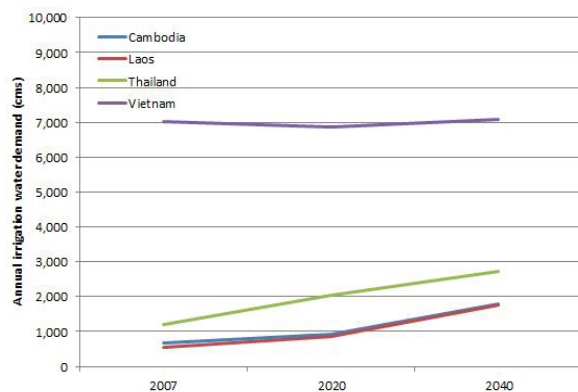


Figure 2.7. Projected change in annual irrigation water demand based on current national plans to 2040

Groundwater use has been relatively modest in most parts of the Mekong River Basin. Thailand and Viet Nam both use groundwater to irrigate crops, yet the lack of extensive transboundary aquifers outside the Mekong Delta has meant limited need for regional engagement on transboundary issues. Groundwater extraction in the Mekong Delta, especially for urban and industrial uses, has been identified as a major contributor to the significant land subsidence problems there.

Domestic water demand is projected to increase across the LMB by around 76% by 2040 and industrial demand to increase by around 192% in line with population growth and further industrialisation of national economies. Nevertheless, domestic and industrial demand for water in the Mekong River Basin will remain relatively small compared to other sectors.

2.3 Water resources development implications

The construction of tributary and mainstream dams is changing the flow regime of the basin and this presents both challenges and opportunities. Further construction of in-stream barriers will exacerbate these impacts and contribute to others. The location and design of dams can, however, have an important bearing on the overall costs and benefits including for people in vulnerable situations experiencing poverty and at risk of food insecurity. This raises questions about whether national plans can be further adapted to optimise regional benefits and ensure adequate consideration of trade-offs between sectors, particularly between fisheries and power generation.

The impacts of dams have had a significant impact on the transport of sediment from the Upper Mekong River Basin to the LMB and further instream barriers are expected to make this problem worse. The implications of this reduction in sediments are increased erosion and riverbank failure, potentially less productive fisheries and floodplains, and reduced replenishment of the delta which is affected by subsidence and sea-level rise. In-stream barriers also significantly reduce fish migration having detrimental impacts on spawning and recruitment of fish to subsequent generations. Different fish species and ecosystems will be affected to a greater or lesser extent by the changing hydrograph depending on their ecological requirements.

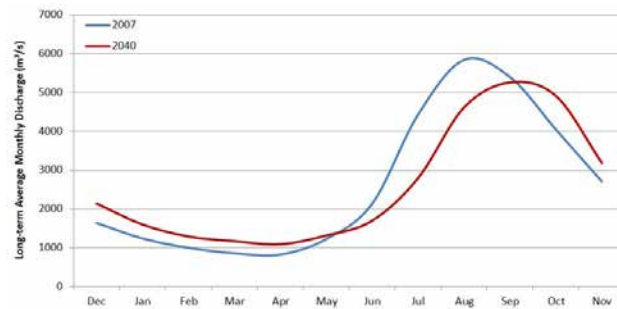


Figure 2.8. Projected change in monthly average discharge by 2040 at Chiang Saen due to water resources development and climate change

The challenges faced in the Mekong Delta in Viet Nam due to development activities are particularly acute. Reduced replenishment of sediment from upstream, subsidence due to groundwater extraction, sediment extraction which deepens channels and exacerbates the impacts of tides on erosion, and increased salinity intrusion are significant issues requiring urgent attention.

Hydropower operations are increasingly playing a role in rapid river level fluctuations as projects are commissioned and respond to electricity demands and grid stabilisation requirements. These fluctuations can have negative impacts on downstream communities including in relation to the viability of traditional riverbank agriculture and other livelihood activities. Reservoirs will need to be managed during flood and to enable periodic sediment management releases. This increased regulation of the basin and the opportunities and challenges it brings requires greater operational coordination, improved water release protocols, data and information sharing, and enhanced early warning systems.

The change in flow regime also means potentially more water available during the dry season. This water could be used to expand irrigation, help manage the risks to agriculture of more frequent or extreme droughts due to climate change, and/or for additional flows to the delta to help combat salinity intrusion. Determining the equitable and sustainable use of these additional flows will be an important consideration for regional cooperation over the next ten years.

Water availability is strongly influenced by the condition of the catchment, which is being affected by deforestation and other land use change including urbanisation and conversion of wetlands and floodplain throughout the Mekong River Basin. More forested areas will slow the rate of run-off into rivers and streams, mitigating flash floods and providing extended groundwater discharge through the dry season. The influence of catchment development on the Mekong's hydrology is evident in Cambodia, Thailand and Lao PDR. Protecting watersheds upstream of reservoirs and settlements in particular is likely to be increasingly important as the population and value of infrastructure on the floodplain increases and as sedimentation of dams risks their power generating capacity.

2.4 Water resources management

At a national level, each country seeks to implement water resources management appropriate to its national needs and all countries have national water laws and dedicated national agencies responsible for water resources management. The basin countries are increasing efforts to manage and regulate developments.

Cambodia's national water law focuses on the sustainable utilisation and conservation of water resources and determines the rights and obligations of water users. It provides for the establishment of water-user groups to facilitate participation of local communities in the sustainable development and management of water resources. In addition, the Royal Government of Cambodia (RGC) promotes integrated water resources management and gives high priority to water related sectors and their integration, including flood and drought management and mitigation, irrigated agriculture, fisheries and waterborne transport.

Lao PDR has recently adopted a new water law and is in the process of finalizing its new National Water and Water Resources Management Strategy. The new law governs water use throughout the country and includes provision for environmental flows and new standards on pollution control. A national coordinating and monitoring center in relation to hydropower operations is being established. The amended Electricity Law 2017 and updated Policy on Sustainable Hydropower Development 2018 strengthened the planning, assessment and monitoring of major projects.

Thailand introduced a new water resources law in 2018 and established a new Office of National Water Resources, which also hosts the Thai National Mekong Committee secretariat, under the Office of the Prime Minister to improve coordination across sectors and engagement on Mekong issues. A key feature of the arrangements is the further development of river basin organisations to support planning and implementation of Integrated Water Resources Management and climate adaptation at a sub-basin scale.

Viet Nam's Resolution No. 120/NQ-CP on *Sustainable and Climate Resilient Development of the Mekong Delta* introduces a shift in emphasis for agriculture and seeks to further boost aquaculture. A key driver of Resolution 120/NQ-CP is an effort to coordinate Ministerial and provincial actions to achieve more sustainable and higher value development in the face of expected climate change impacts including rising sea levels, increased salinity intrusion and the risk of severe flooding.

China is implementing integrated water resources management plans to address serious water shortages that are constraining social and economic development. These plans will seek to limit future demand, increase water use efficiency and improve water quality. Moreover, China is building multilateral engagement with South East Asia in all sectors of the economy including water. Myanmar is preparing a new water law based on integrated water resources management principles and is developing IWRM plans for major river basins.

In relation to international water law, the 1997 UN Watercourses Convention¹⁰ has now come into force and although the *1995 Mekong Agreement* has primacy among LMB countries, the future development of projects with transboundary impacts could be influenced by the provisions of the Convention. From the basin countries, only Viet Nam has ratified the Convention so far.

As the Mekong countries undertake reforms to improve the investment environment, and clarify the rules for resource utilisation, there are increasing opportunities for the private sector (and state-owned companies) in the development of water and related resources. In areas including hydropower, navigation, large-scale irrigation, and industry, investment from the private sector now outweighs that from traditional public sources.

Compared to conventional public sector driven developments, the emerging private sector developments are more opportunity-driven with relatively short planning cycles and assessment processes designed to meet minimum requirements. Moreover, private project developers do not have to comply with safeguard policies of the multilateral banks, which previously dominated the hydropower and irrigation sectors. Strong government regulatory systems and enforcement capacity and the readiness to interpret national policies to include emerging good practice and guidelines from regional organizations are therefore needed.

10 For further information on the UN Watercourses Convention see: <https://unwatercoursesconvention.org>

2.5 Regional cooperation and integration

National sovereignty, customs and administrative systems are the foundation of planning, decision-making and the management of water resources within the Mekong River Basin. Due to transboundary concerns, these national systems are overlaid with a regional cooperation framework consisting of the *1995 Mekong Agreement* between the four LMB countries and more recently the *Mekong-Lancang Cooperation* mechanism between all six riparian nations.

Cooperation between the Mekong countries is accelerating

Cooperation between countries throughout the Mekong and wider region is becoming deeper and more comprehensive, especially through ASEAN, the primary regional cooperation body for Southeast Asian countries, including all LMB states. In 2015 the ASEAN Economic Community was established, eliminating tariffs between Member Countries in a market of USD 2.6 trillion and a region of 622 million people. China is ASEAN's number one trading partner, and trade and foreign direct investment between all countries is growing strongly.

Substantial cross-border infrastructure improvements are taking place in electricity, communications, and transport. In 2018 the region's first multi-lateral electricity trade took place involving Lao PDR, Malaysia and Thailand. Trade barriers continue to come down and there is a focused effort to improve connectivity and harmonise the regulatory environment.

Compared to the pace and scope of this increased integration across the broader regional economy, cooperation in water resources planning and development has been relatively modest. National water-related sector plans are prepared and implemented largely independently from those of the other basin countries. Regional water cooperation focuses primarily on data and information sharing and knowledge acquisition, while joint investment projects by two or more countries have been developed only for hydropower, driven by energy sector planning.

Regional platforms for water cooperation

In Mekong water resources development and management, the four Lower Mekong riparian states have been cooperating through the MRC, based on the *1995 Mekong Agreement*, for 25 years, building on a long history of cooperation since 1957 with the Mekong Committee. The Upper Mekong states of China and Myanmar have been dialogue partners of the MRC since 1996, cooperating in data and information sharing, technical exchanges, joint studies, and policy dialogue.

The MRC remains the only treaty-based intergovernmental river basin organisation with a clear mandate and core functions, focusing on principles of integrated water resources management, common procedures, strategies, guidelines and tools to support the sustainable and equitable use of water and related resources, and joint actions to address transboundary issues. As a regional knowledge hub and water diplomacy platform, its core functions have been defined to include: data acquisition, exchange and monitoring; analysis, modelling and assessment; basin planning support; forecasting, warning and emergency response; implementation of the five MRC procedures for basin management; and dialogue and facilitation.

The MLC, recently established through the Sanya Declaration in 2016, has a broader scope with water resource management being one of five priority areas, which also include connectivity, production capacity, cross-border economic cooperation, and agriculture and poverty reduction through project-based initiatives. MLC water cooperation does not solely focus on the Mekong River Basin but on regional, national and local water issues in the six countries (Cambodia, China, Lao PDR, Myanmar, Thailand and Viet Nam). Projects are financed through a Special Fund which provides a vehicle for investment and technology transfer in water resources management.

The water resources cooperation area of MLC (MLC Water) is managed through a Joint Working Group (JWG) of water and related line agencies in the six countries supported by the Lancang-Mekong Water Resources Cooperation Center (LMC Water Center) in Beijing. The Center is a platform for technical exchanges, research, information sharing and capacity building. A Lancang-Mekong Environmental Cooperation Center has also been established in Beijing.

The JWG is an important new avenue for whole-of-basin cooperation. The MRC Secretariat being granted observer status at JWG meetings and the agreement to a Memorandum of Understanding between MRCS and LMC Water Center is evidence of the willingness of both cooperation platforms to work more closely together. Increasing engagement between MRC and the MLC Water builds on the strong positive trajectory of cooperation between the MRC and China highlighted above.

Other Mekong water-related cooperation mechanisms

Beyond the principle water resources cooperation platforms of the MRC and MLC Water, other key cooperation mechanisms involved in Mekong water resources related issues in the region include ASEAN, the GMS initiative, the Lower Mekong Initiative (LMI)/Mekong-US Partnership, the Ayeyarwady-Chao Phraya-Mekong Economic Cooperation Strategy (ACMECS) and the Mekong Initiatives of Japan and the Republic of Korea (ROK). The key water-related areas of focus of each of these mechanisms are identified in Table 2.1.

The ASEAN community is becoming more and more prominent in reflecting regional socio-economic development and trends in joint visions that intersect with basin water resource management issues such as gender- and child-centred disaster risk reduction, and strengthened social protection to reduce vulnerabilities. These include the ASEAN Socio-Cultural Community Blueprint 2025, and the growing number of active committees in social matters, such as the ASEAN Committee on Women, and the ASEAN Commission on the Promotion and Protection of the Rights of Women and Children. In the water related areas, ASEAN have active committees and working groups devoted to water resources management, energy, environment, fisheries, and disaster management, among others.

Table 2.1. Water-related focus areas of other key cooperation mechanisms in the Mekong River Basin

	ASEAN	ACMECS	GMS	LMI/MUSP	Mekong-Japan	Mekong-ROK
Related Focus Areas	<ul style="list-style-type: none"> - Water supply, demand and management - Water quality and sanitation - Environment - Climate change, extreme events - Energy 	<ul style="list-style-type: none"> - Environment - Climate change and disasters - Renewable energy - Natural resource management - Agriculture - Tourism 	<ul style="list-style-type: none"> - Energy - Environment - Climate change - Tourism - Transport 	<ul style="list-style-type: none"> - Environment and water - Agriculture, food and energy security - Data collection, modelling tools, and data and information management 	<ul style="list-style-type: none"> - Water resources - Climate Change - Disasters 	<ul style="list-style-type: none"> - Green Growth - Water resource development - Agriculture and rural development
Modes of cooperation	<ul style="list-style-type: none"> - Governance and policy making - Technical exchanges - Capacity building 	<ul style="list-style-type: none"> - Investment - Human development and capacity building - Application of modern technology 	<ul style="list-style-type: none"> - Investment - Capacity building 	<ul style="list-style-type: none"> - Policy and technical exchanges - Capacity building 	<ul style="list-style-type: none"> - Investment - Technical exchanges and capacity building 	<ul style="list-style-type: none"> - Investment - Policy and technical exchanges - Capacity building
Members	Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam. China is a Dialogue Partner along with 9 other countries	Cambodia, Lao PDR, Myanmar, Thailand, Viet Nam China is a Development Partner, along with Australia, Japan, Republic of Korea, USA, and India	Cambodia, Lao PDR, Myanmar, Thailand, Viet Nam, China (Yunnan Province and Guangxi Zhuang Autonomous Region)	United States with Cambodia, Lao PDR, Myanmar, Thailand, Viet Nam	Japan with Cambodia, Lao PDR, Myanmar, Thailand, Viet Nam	Republic of Korea with Cambodia, Lao PDR, Myanmar, Thailand, Viet Nam

In addition to the above, the development partners continue to provide strong support to integrated water resources management in the region both through cooperation with the regional platforms and the other mechanisms and bilaterally with basin countries. The Joint Committee on the Coordination of Commercial Navigation (JCCCN) involving China, Lao PDR, Myanmar and Thailand continues to play an important role in helping facilitate the expansion of navigation in the upper parts of the basin.

Consistent with its role to *coordinate the work of relevant actors on water and related resources development and management* in the Mekong in order to ensure synergies and minimize duplication of efforts and resources, the MRC is strengthening relationships with these other regional bodies and through key bilateral arrangements. There are also many civil society and community actors, including non-government organisations, researchers, academics, and media, with a strong stake in Mekong water resources development and management, who are working with and beyond these formal cooperative arrangements.

Towards a deeper and more strategic regional cooperation

The increasing regulation of the basin and the uncertainties and opportunities presented by hydropower operations in the management of floods and droughts, and in rapid water level fluctuations highlights the importance of enhanced cooperation between upstream and downstream states. Enhanced regional cooperation will need to go beyond identifying and sharing information to avoid duplication in areas of ‘common interest’ and focus on strategic win-win outcomes in areas of ‘complementary interest’, where the relative strengths of different bodies can be maximised in support of integrated policy approaches at the water-food-energy nexus. Areas of complementary interest between different bodies include water resources and energy planning, environmental and social protection, and benefit sharing, data management and infrastructure operations, and early warning and disaster response amongst others.

Deeper cooperation will require each organisation to clearly articulate its role and comparative advantage and to participate in and help shape areas of complementary interest in the strategies and action plans of the other regional organisations, initiatives and programmes. Cooperation is not an end in itself and so selective engagement on a small number of high priority areas focused on achieving the Outcomes of this BDS may be more effective than broad overlapping efforts through multiple avenues.

Continued improvements in prior notification and consultation arrangements for development projects, including earlier engagement in project design will be beneficial. The recent SOBR has highlighted the need to enhance data and information exchange, improve water use monitoring and to elevate cooperation to a level that not only includes joint environmental monitoring, but also joint overall planning of future strategic development to optimise sustainable development and management of the basin’s resources.

To achieve the desired Outcomes of this BDS the two regional cooperation platforms will need to work together to facilitate more proactive regional planning and operational management between upper and lower basin countries. Over the period to 2030 a deeper institutionalisation or evolution of the relationship between MRC and MLC Water should be explored.





TRENDS AND LONG-TERM OUTLOOK

This Chapter provides an overview of current conditions and trends and an outlook to 2040. Unless otherwise noted, the information is drawn from the 2018 SOBR (updated to include more recent World Development Indicator data¹¹ and China and Myanmar, where available)¹² and recent scenario assessments based on current national plans completed by the MRC.¹³ It forms the basis for the strategic responses in Chapter 4.

The Mekong River Basin is a highly dynamic region, with a vast endowment of natural resources, young and increasingly well-educated and connected population, and multiple avenues of growth and opportunity ahead. Large inflows of foreign direct investment, particularly in agriculture, energy, and tourism are transforming the landscape and offer the promise of substantial improvements in productivity and incomes. Investment in multimodal transport, communications and electricity infrastructure is connecting people and economic activity within the basin and beyond.



11 See <https://datacatalog.worldbank.org/dataset/world-development-indicators>

12 The 2018 SOBR also outlines areas where there are substantial data gaps, especially in relation to social and economic conditions and trends. Emerging issues such as solid waste management and plastic pollution were not identified in the 2018 SOBR due to a lack of data at the time of preparation. These issues may need to be addressed in future reports.

13 See <https://www.mrcmekong.org/news-and-events/news/interactive-report-for-the-council-study/>

3.1 Environment trends and outlook

Water flow conditions

Flows in the Mekong mainstream are generally within agreed limits¹⁴, with only occasional exceptions. Nevertheless, monitoring at Chiang Saen indicates annual and flood season flows are substantially lower and dry season flows higher than long-term averages since the construction of large reservoirs in China. Flows at Kratie show a similar but less marked increase in dry season flows, with no discernible difference yet at the delta.

In addition to changes in monthly discharge, recent years have seen significant flow variability, particularly in Lao PDR and Thailand, with hydropower operations and heavy rainfall events contributing to rapid changes in water levels of up to two metres in a day. These changes are causing concern for riparian communities, including due to the impacts on riverbank agriculture and other livelihood activities.

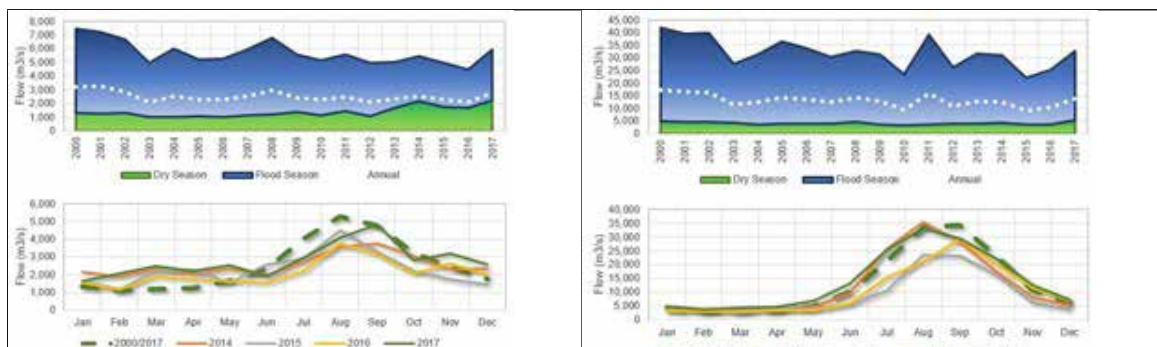


Figure 3.1. Recent annual mainstream flow conditions at (a) Chiang Saen and (b) Kratie

Outlook

The modification of the flow on the mainstream is expected to continue with further development of mainstream and tributary hydropower. This will likely result in the continued shift in flows from the wet season to the dry season and a delay in the onset and offset of the annual flood. Lower flood season flows may reduce connectivity with wetlands and the productivity of the floodplain, particularly in Thailand and Lao PDR, but may also mean lower flood damages, if the changes are not reversed by climate change.

¹⁴ Maximum and minimum flow limits have been agreed in the LMB under the PMFM

Water quality and sediment conditions

Water quality in the basin as it relates to human health, aquatic ecology and agriculture is generally good. Samples from the MRC's routine water quality monitoring rarely exceed target values. Where target values are exceeded this is often for phosphorous and nitrogen in the Tonle Sap and delta area, likely due to fertiliser use in surrounding catchments.

Sediment transport along the mainstream has been significantly curtailed by the development of large storages in the upper part of the basin. The average annual suspended sediment load at Chiang Saen decreased from about 85 MT/year to 11 MT/year from 1994 to 2013. Given the importance of sediments to nutrient transport, erosion and deposition processes, delta stability, and fisheries and agricultural productivity, this decline is alarming.

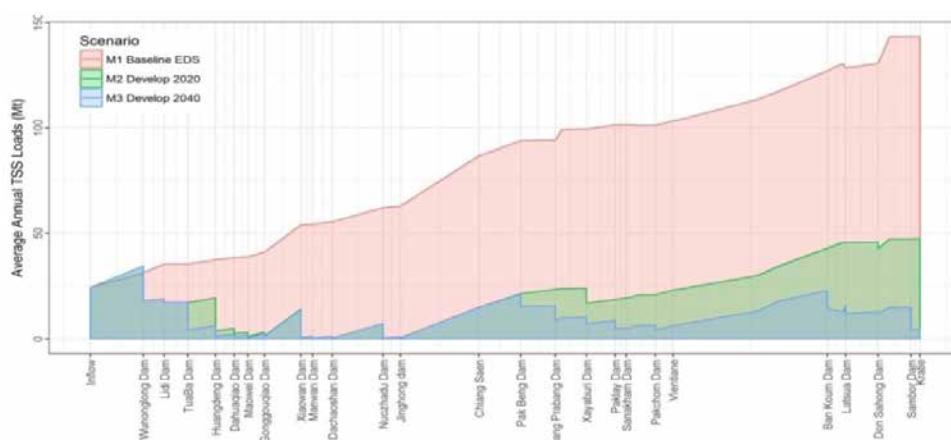


Figure 3.2. Projected suspended sediment loads along the mainstream under different scenarios¹⁵

¹⁵ The scenarios examined were M1 (development as it was in 2007), M2 (development planned to 2020), and M3 (development planned to 2040), see <https://www.mrcmekong.org/news-and-events/news/interactive-report-for-the-council-study/>

The loss of sediments in the river is only likely to increase with further construction of dams and sand mining. One worst case scenario suggests the sediment load by the time the flow reaches Kratie could almost disappear by 2040, and bank protection costs to combat increased erosion are estimated at up to USD 6 billion. Some of the planned dams will have bigger negative impacts on sediment transport than others.

Further urban and industrial development and intensification of agriculture may put increasing pressure on water quality. The use of fertiliser and pesticides is increasing and is an area to watch due to the risk of pollutant runoff causing impacts on receiving waters. The lower flow environment and flow variability created by dams and climate change may also present new risks from algal blooms and low dissolved oxygen, threatening fish and dependent livelihoods.

Environmental assets

Wetlands of the Mekong River Basin are important hotspots of biodiversity and play an important role in the economy, society and culture of the region. They are severely threatened and gradually being degraded or lost completely. Between 2003 and 2010 the area of mangroves declined by 30%. With a little over 100,000 km² of wetlands left in the LMB in 2010, MRC has estimated less than two per cent of the original wetland area in the Mekong Delta remains.

The Mekong River Basin supports one of the world's most diverse freshwater environments with around 1,200 fish species recorded. Total biomass is estimated to have declined considerably over the past 100 years due to agricultural land development including massive expansion of rice farming and deforestation, intensive fishing pressure, hydropower development, sediment extraction, urbanization and industrial development and associated pollution.

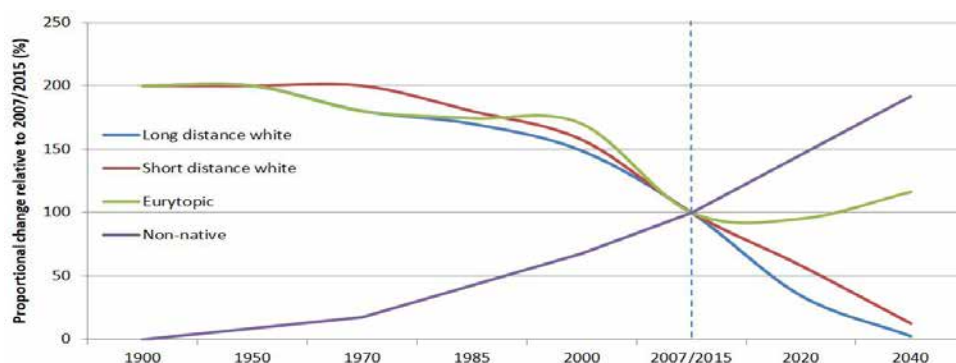


Figure 3.3. Estimated past and projected change in fish biomass relative to 2007/15 for select types

Outlook

The outlook for native fish in the LMB is poor with total biomass projected to decline substantially by 2040. This is largely due to the effect of planned infrastructure developments in the mainstream and tributaries, with in-stream barriers having a particularly negative impact on valuable migratory species, some of which are likely to become extinct.

The change in the river environment is likely to favour generalist and non-native species over others. The effects of development on fish populations raise important concerns about food security and the livelihoods of people in vulnerable situations. Wetlands and watersheds are likely to continue to face pressures, although all countries have made progress in establishing protected areas and implementing conservation measures to mitigate adverse impacts.

3.2 Social trends and outlook

Overall social conditions

Population is growing strongly across the basin although at a declining rate due to dramatic falls in fertility rates in the 1980s and 90s. The total basin population in 2020 is estimated at 72.1 million, of which 25.4 million are in Thailand, 19.8 million in Viet Nam, 13.4 million in Cambodia, 6.3 million in China, 6.2 million in Lao PDR, and 0.8 million in Myanmar. The expansion of employment opportunities in and around urban areas is driving significant rural-urban migration. While the basin population is still predominately rural, large and growing urban centres (such as Vientiane, Phnom Penh and Can Tho) form an increasing share of the population.

Poverty rates have fallen sharply in all basin countries, including in rural areas. Rural poverty levels in LMB countries are between 15% and 30% of the population with the highest rate in Cambodia and the lowest in Thailand. Between 2011 and 2015, China's Yunnan province saw a reduction of more than 50% in the proportion of the population below the national poverty line. Notwithstanding these reductions, inequalities between urban and rural areas and between different groups within society remain.

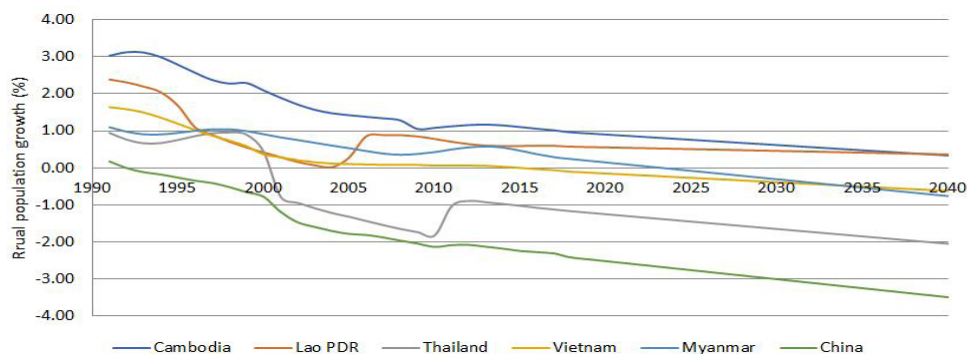


Figure 3.4. Rural population growth in Mekong River Basin countries

At current growth rates the population of the basin is projected to be around 100 million by 2040. The UN projects that by 2050 between 50% and 70% of the population in Lao PDR, Viet Nam and Thailand will live in cities. The population in rural areas is likely to fall in all countries, although with a relatively large proportion remaining in rural areas in Cambodia.

Based on current trends, a continued reduction in poverty is possible subject to the global fall-out from COVID-19 and how governments respond. However, relatively large numbers of poor, natural resource dependent communities are likely to persist for some time, alongside improving but still present gender inequalities in paid and unpaid work.

Living conditions and wellbeing

Food security in the basin has improved considerably over the last 20 years. The adequacy of dietary energy supply increased by between 5% and 20% from 1999 to 2016 such that nationally all LMB countries produce enough food to meet more than 100% of their dietary energy needs. The prevalence of undernourishment has also declined, although parts of the basin still have large populations experiencing undernourishment and relatively high rates of infant malnutrition, indicating inequality of access to food.

Access to improved water sources, sanitation facilities and electricity has increased substantially since 2000, yet significant variations exist both within and between countries, reflecting different stages of development. Thailand is close to 100% of the population having access to at least basic drinking water services and Viet Nam is not far behind. China, Thailand and Viet Nam are at full electrification, with Lao PDR and Cambodia rapidly gaining ground. Rural populations lag their urban counterparts in access to sanitation and electricity.

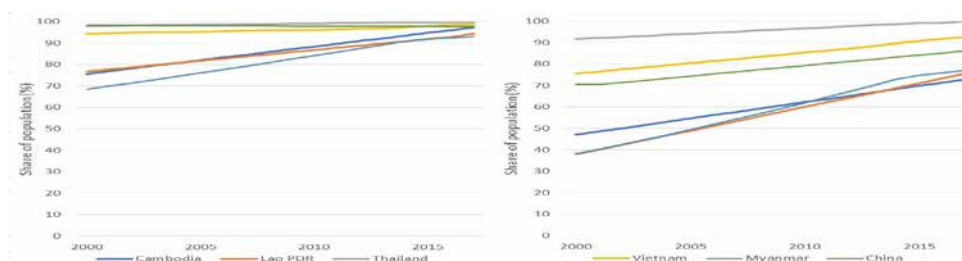


Figure 3.5. Share of (a) urban and (b) rural populations with access to at least basic drinking water

The outlook for food security in the basin is generally positive, although may be at risk in future due to the impacts of climate change on crop production and fish yields, particularly during extreme dry years. Access to safe water, sanitation and rural electrification is expected to continue improving, consistent with historical trends.

Livelihoods and employment

Agriculture, fisheries and forestry are an important source of employment for the people of the Mekong River Basin yet the share of overall employment in these sectors is in gradual decline. In 2017 Cambodia was estimated to have had 66% of its total employment in these sectors, Lao PDR 61%, Thailand 33%, Viet Nam 41% and China's Yunnan province 55%. The decline in the share of employment in these sectors is due to strong growth in manufacturing and services industries, particularly in and around urban areas.

Only small differences exist between the proportion of men and women employed in primary industries. However, data suggests a large gender wage gap throughout all industries, additional to women's often limited access, control and ownership of land and assets.¹⁶ The proportion of girls to boys in primary education illustrates continuing gender disparities, especially in Cambodia, Lao PDR and Myanmar.

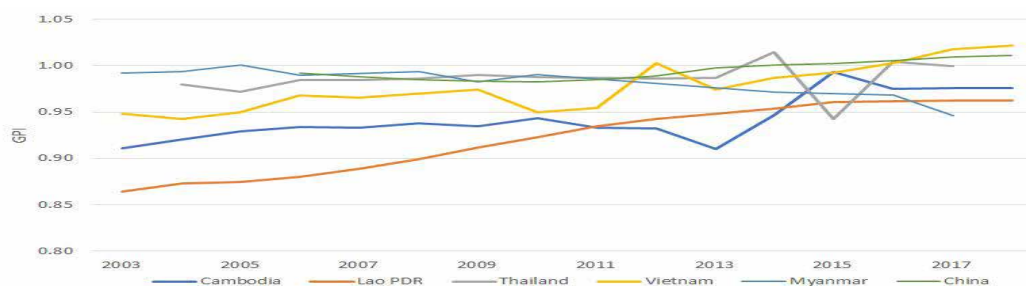


Figure 3.6. Gender Parity Index for primary school enrolment in Mekong River Basin countries

¹⁶ See: <http://library.fes.de/pdf-files/bueros/singapur/12676.pdf>

An expansion of agriculture in the Mekong River Basin is likely to increase demand for agricultural workers. Recent assessments indicate this demand has the potential to compete with higher value manufacturing and services industries leading to negative pressure on overall economic growth from labour deficits and underutilised infrastructure. If navigation continues to grow as planned by basin countries, employment in that sector could double by 2040.

Gender parity in employment and economic security is likely to improve gradually over time, consistent with development trajectories and national goals. However, while the number of women employed may increase, this will not necessarily translate into gender equality which is also dependent on the type of work and wages earned. A lack of gender disaggregated data for key statistics to inform planning will hamper progress.

3.3 Economic trends and outlook

Overall economic performance

Mekong River Basin economies are growing rapidly. Average national GDP growth was between 3.2% and 8.1% per annum between 2008 and 2018. Growth was primarily in manufacturing and service sectors, with agriculture's average share of GDP declining from 23% to 15% over the same period. Thailand's GDP per capita is approximately five times that of Cambodia and three times Viet Nam and Lao PDR. Per capita GDP in China's Yunnan province tripled from 2007 to 2016.

The economy of the basin has continued to grow despite weaker export growth in recent years due largely to solid inflows of foreign direct investment and continued strength in domestic demand. However, the global economic impact of government responses to the new coronavirus (COVID-19) will be severe and even if resolved quickly, likely to have ripple effects throughout the early period of the new BDS. These effects may have implications for the viability of planned investments in water resources development and the relative value of different energy generation and food production options.

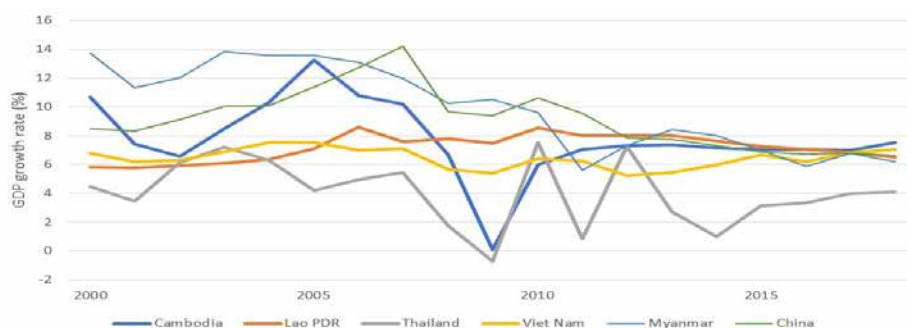


Figure 3.7. GDP growth rate in Mekong River Basin countries

Outlook

Future economic growth across the basin is likely to be lower than in the past. Across the LMB, the average growth rate to 2040 is projected to be between 2.5% and 3.5% per annum. Cambodia and Lao PDR are expected to reach middle income country status by the middle of the decade, maintaining higher growth than Thailand and Viet Nam, with rates closer to 5%.

Slower global growth in the short-term is expected to continue to hit exports from basin countries. Trade surpluses are narrowing in China, Thailand and Viet Nam. Prospects for growth in exports over the medium to longer term are nevertheless strong if global growth returns to trend.

Economic performance of agriculture

Although agriculture's share of GDP is declining, it remains an important source of economic value and food security and is a major employer in the basin. Nationally, agriculture exports in 2017 were valued at USD 42 billion in Thailand and USD 8.6 billion in Viet Nam. In 2013, irrigated rice production in the LMB was worth more than USD 7.7 billion, of which 83% was from the Viet Nam part of the delta. Rice from the LMB represents around 50% of the total produced from the four countries. In China's Yunnan province, agricultural production is now valued at over USD 30 billion, having grown rapidly over the last decade.

Conditions and Trends

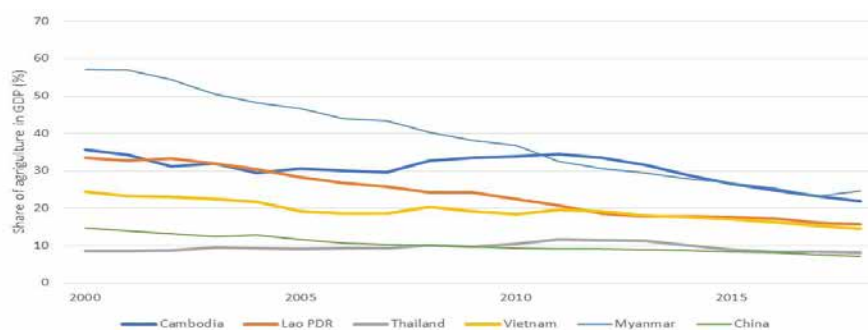


Figure 3.8. Agriculture's share of GDP in Mekong River Basin countries

Outlook

Agricultural value in the LMB is projected to continue growing strongly. Thailand is likely to retain the highest value agriculture sector although substantial gains are expected in both Cambodia and Viet Nam, with Cambodia more than doubling the value of its agricultural output. Global food demand and rising prices will continue to attract foreign investment in the development of agriculture.

Economic performance of hydropower

Energy demand across Southeast Asia grew 60% over the past 15 years and hydropower in the Mekong River Basin is expanding rapidly to help meet some of it, including for expanding transport and connectivity. Electricity generation from LMB hydropower increased from 9.3 GWh to 32.4 GWh between 2005 and 2015. The gross value of the energy produced in 2015 was estimated at more than USD 2 billion, up from around half a billion a decade earlier. Lao PDR is the largest producer, with more than 50% of the LMB total. The estimated value of hydropower in the Upper Mekong River Basin in China is more than USD 4 billion per annum, from the production of around 80 GW of electricity. Myanmar currently has only one sizeable hydropower operation, with an estimated annual economic value of USD 15 million.

Conditions and Trends

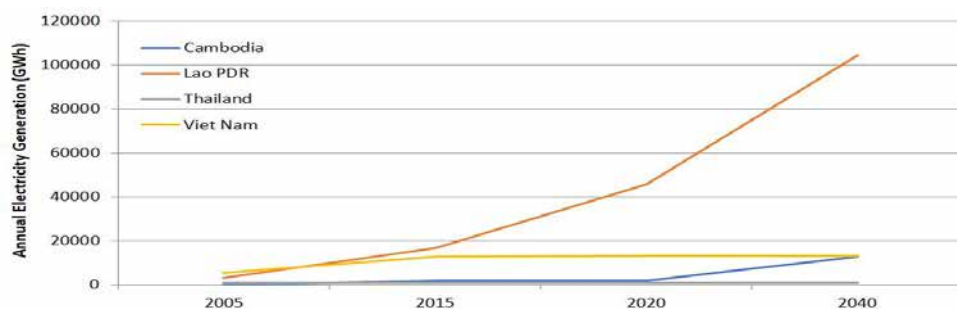


Figure 3.9. Past and projected electricity generation from hydropower in LMB countries

Outlook

The International Energy Agency¹⁷ is projecting Southeast Asian energy demand to grow by two-thirds to 2040. In-line with this growth, there are plans for electricity generation from hydropower to increase to 131 GWh per annum. The value of the hydropower sector is expected to increase across LMB countries accordingly. Further planned dam construction in the Upper Mekong in Xizang/Tibet in China, with a total installed capacity of more than 12,000 MW, means additional economic gains are likely there too.

While the outlook for hydropower is for continued growth in the sector, there are also risks that generation capacity runs ahead of demand and that too much hydropower without adequate storage exposes the sector to additional climate risks, especially under drier future conditions. Cost reductions in other renewable sources, particular solar, are expanding the development options available to countries, and globally the International Energy Agency is projecting installed capacity from solar to exceed hydropower by 2030.¹⁸ Cambodia and Lao PDR are considering solar energy projects, including on reservoirs.

¹⁷ Southeast Asia Energy Outlook 2019

¹⁸ World Energy Outlook 2019

Economic performance of fisheries and aquaculture

Fisheries in the Mekong River Basin are an important source of food security and livelihoods (see production figures below). While the amount of fish caught is increasing, fishing effort has also increased and smaller, less valuable species now make up an increasing proportion of the catch. In 2015, annual capture fisheries production in the LMB was valued at USD 11 billion with more than 50% of this value coming from fish harvested in Thailand's paddy rice fields.

In 2015, annual aquaculture production was valued at USD 5.8 billion, of which 86% was from Viet Nam. Over the last 10 years the industry has experienced average annual growth of more than 11%. Per capita output in Yunnan province increased by more than 180% over a similar period.

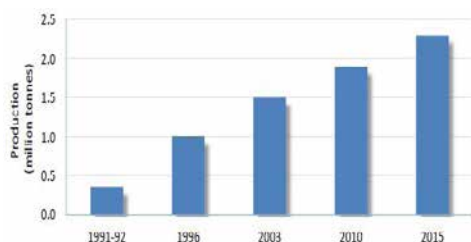


Figure 3.10. Capture fisheries production in the LMB

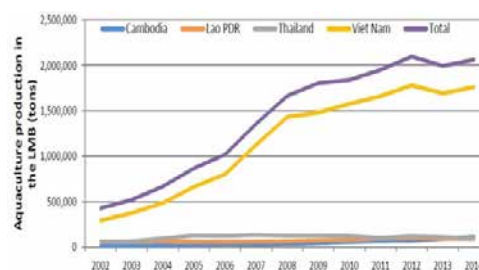


Figure 3.11. Aquaculture production in the LMB

In-line with a decline in fish biomass, the value of capture fisheries in the LMB is projected to decline over the next 20 years. This is largely due to the further construction of barriers to fish movement both in the mainstream and tributaries, but land-use change and climate change, and signs of heavy fishing pressure indicate the threats are multiple and varied. Marine fisheries off the coast of the delta are also likely to suffer due to a reduced sediment and nutrient plume.

Aquaculture production is forecast to continue growing strongly, particularly in the delta where it will continue to displace agriculture due to higher economic returns and the effect of salinity intrusion on agricultural yields. Despite considerable challenges, opportunities for further aquaculture development in the Mekong River Basin, including in reservoirs, taking into account the different needs and roles of both men and women in using and managing the resource, may need to be explored.

Economic performance of navigation

The Mekong River is an important inland waterway for both cargo and passenger transport. An estimated 800,000 tons of cargo are shipped annually between China, Thailand, Myanmar and Lao PDR. Cargo volumes across all LMB countries grew by more than 6.4% per year between 2007 and 2014 with average annual growth of 3.7% in Thailand, 6.2% in Lao PDR, 7% in Cambodia and 6.5% in Viet Nam.¹⁹

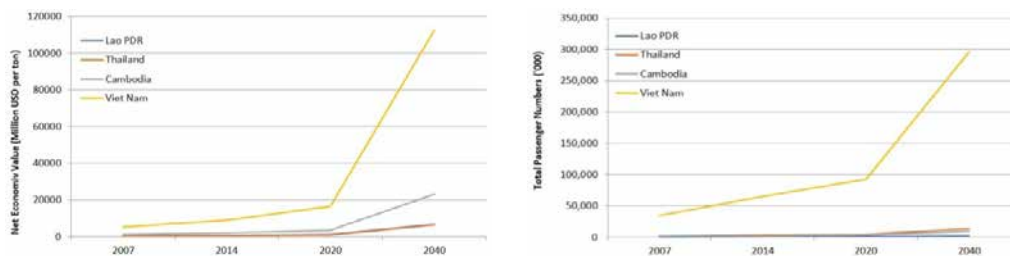


Figure 3.12. Current and projected economic value per ton of cargo transport; and passenger numbers

Based on national plans, navigation is expected to expand considerably to 2040, facilitated by further hydropower development on the mainstream, as well as dredging and clearing of rocky areas within the channel. The MRC Master Plan for navigation foresees an increase in cargo and tourism capacity in both the upper parts of the Mekong River between China, Thailand and Lao PDR, and in the lower reaches between Cambodia and Viet Nam. The value of the navigation sector is projected to increase substantially across the LMB with Cambodia and Viet Nam the major beneficiaries, with related benefits for other sectors. However, development of navigation is highly dependent on the capacity and links with other transport modes and corridors and can also bring risks including riverbank erosion and damage to fish habitats.

3.4 Climate Change trends and outlook

Greenhouse gas emissions

Greenhouse gas emissions relative to GDP of Mekong River Basin economies have fallen dramatically since 1990, particularly in Cambodia, Lao PDR and Myanmar. However, total greenhouse gas emissions are rising by about 1.3% to 3.6% per annum, due to both population growth and economic development. Emissions in Cambodia, Lao PDR and Myanmar are only a fraction of those from the other basin countries, particularly China, and are dominated by agriculture and land use, land use change and forestry.

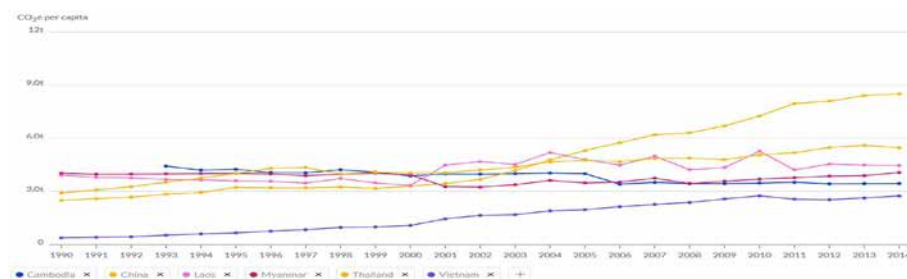


Figure 3.13. Greenhouse gas emissions per capita in Mekong River Basin countries

Greenhouse gas emissions are projected to increase in all countries to 2030 under business-as-usual (BAU) scenarios. Under the Paris Agreement on Climate Change LMB countries have made commitments to reduce emissions by between 8% and 27% from BAU. In some cases this is expressed as an absolute reduction in emissions and in some cases a reduction in emissions intensity with the specific approach reflecting national priorities. Access to international financing is identified as necessary to meet the higher levels of emissions reduction ambition. China has a commitment to reaching peak CO₂ emissions by 2030 and for reductions in emissions intensity of 60-65% below 2005 levels.

Climate change trends and extremes

Average annual basin-wide temperatures and precipitation have increased over the historical record. Sea-level around the delta is rising. However, there is no evidence to-date of more intense rainfall events or more frequent or intense tropical storm activity. Indeed, there is evidence storm intensity may be decreasing.

Trends in the extent and severity of floods and droughts are difficult to identify due to high variability in the basin from year to year. There may have been a slight increase in flood peaks and flooded areas and a slight overall decrease in drought conditions over recent decades, but further monitoring over longer time periods is necessary.

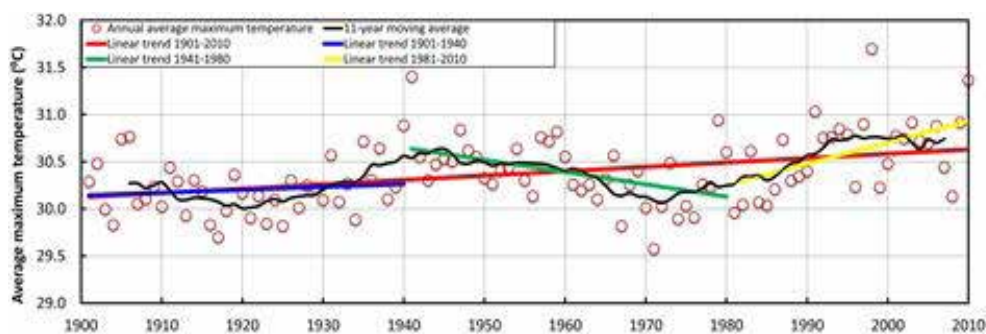


Figure 3.14. Average maximum temperature across the LMB for the period 1901–2010

Temperatures are projected to continue increasing across the basin and across seasons. By 2060 under the worst-case projections, the average annual basin-wide temperature could be up to 3.3°C higher depending on the global emissions trajectory. Rainfall could increase or decrease with large variation in the magnitude and location of change.

Overall basin water yield, annual river flow and water level, wet season duration, peak flow and level, and dry season minimum flow and level, could all either increase or decrease. The range in possible outcomes is enormous with annual river flow varying by between -59% and +27%, and dry-season minimum one-day flow changing by between -65% and +35% at Chiang Saen. Basin development will interact with the effects of climate change, in some cases exacerbating the impacts and, in some cases mitigating them.

Adaptation to climate change

Climate change adaptation efforts are in their early stages in each country. All countries have policies, strategies and/or plans to respond to climate change and have established both operational and oversight bodies to coordinate actions. While many studies and projects have been completed, further work is necessary to fully mainstream climate change concerns into spatial and development planning within and across sectors.

The proportion of rice and maize irrigated increased from about 27% to 36% between 2000 and 2015 across the LMB, and total live storage increased from 1% to about 14% of the Mean Annual Runoff over the same period. The average annual cost of flood damages for 2010-14 was USD 0.2 billion per year although with substantial variation from year-to-year. Flood protection measures (levees and flood ways) continue to be constructed around built-up areas.

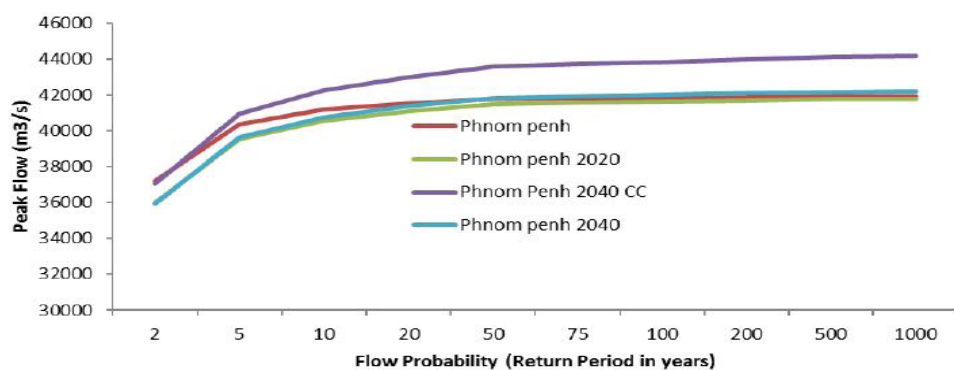


Figure 3.15. Current and projected peak flows for different flow probabilities at Phnom Penh

Outlook

Flood damages are projected to be five to ten times higher by 2040. Smaller floods at Phnom Penh may be similar to what they are today as the impacts of upstream development on reducing flood season flows is reversed by a wetter climate. However, at higher return intervals, above one in ten years, wetter climate conditions will cause much bigger and extremely damaging events, especially when combined with continued urban, industrial and agricultural expansion (land-use changes in the basin are currently being mapped).

Climate change could also increase demand for irrigation water by up to 6.6% over the year, or 13% in the wet season under a drier climate. Current plans for upstream reservoir development have insufficient storage to substantially mitigate flooding in the delta area and to meet potential increased irrigation demand. Coordinated spatial development planning in the delta (to protect urban and industrialized areas) is lacking, and so is the identification of vulnerabilities, including by gender.





STRATEGIC NEEDS, RESPONSES AND RISKS

Recognizing the trends and long-term outlook described in Chapter 3, this chapter examines the implications for planning and management of the Mekong River Basin. Regional planning and management in the basin will need to change from reactive to proactive to increase regional benefits and reduce costs.

4.1 Implications of recent regional assessments and studies

The Mekong River has always faced challenges because of natural drivers (climate, erosion and sedimentation) and human-made drivers (water resources development and use) of change. During the last decades, water resources development has accelerated to support economic growth and water, food and energy security, but has also had large impacts on the environment. The aim of water management in the Mekong region is to strike a balance between economic, social and environmental outcomes to which most stakeholders can agree. An acceptable balance is being sought by implementing the strategic planning cycle described in Section 1.3 in which the SOBR identifies the key issues that the BDS should address.

The summary of the 2018 SOBR demonstrates that the Mekong River Basin continues to be a highly dynamic region, driven by economic growth and an increasing population. The development of the Mekong's waters contributes considerably to economic growth but also threatens the level and distribution of growth through increasing impacts and risks that large-scale water resources development brings. All water-related sectors, including irrigation and navigation, contribute but the hydropower sector contributes most to the benefits, impacts and risks. The key findings and implications for basin planning and management are as follows:

Environment: Reservoir developments in the basin have caused a significant change in the flow regime of the Mekong and are contributing to the observed drastic decrease in sediment concentrations, leading to extensive riverbank erosion and risks to riverine communities. The long-term consequences of these changes need to be managed to minimise environmental harm whilst leveraging the benefits of more secure dry season flows. The risks to fish populations are substantial and the loss of wetlands and riverine habitats require urgent action to protect remaining assets before they are lost. Water quality requires continued monitoring including on emerging issues such as the risks from increased industrialisation and accidents, as well as plastic pollution.

Social: The poverty rate is declining and living conditions improving in all basin countries. Future food supplies will likely be sufficient to meet long-term dietary needs. Nevertheless, most basin countries still have considerable populations experiencing poverty and undernourishment. Despite overall improvements in social conditions, many households and communities along the Mekong corridor remain vulnerable to shocks, particularly droughts and floods. With the exception of some sectors, inequity and gender inequality are still a hindrance for sustainable development and resilience. Much better information such as spatially and gender disaggregated data is needed to identify poor water-related resource users and specific water sector impacts, to determine where vulnerabilities lie, what are the main causes, and what the opportunities are to improve resilience.

Economic: High economic benefits are being derived in hydropower development while significant benefits are made in irrigated agriculture, capture and reservoir fisheries, sand-extraction and navigation. Benefits and costs are not evenly distributed between and within countries. Current national plans for water-related development will make an adequate contribution to long-term food and energy security but less so to water security: the assessed risks of floods and droughts, due to climate change and reduction of the delta floodplains, need to be addressed soon, jointly or nationally, as solutions will become much more difficult and costly with continuing uncoordinated development.

Climate change: Both temperature and sea level are rising, but other predicted aspects of climate change are not yet evident. The Mekong River Basin lies within the Asia and Pacific region which could be more vulnerable to climate change risks than other regions. The basin countries are all engaged in managing climate change and this should be reinforced through basin-wide planning efforts. Future climate change may exacerbate the losses from extreme events with greater numbers of people affected by larger flood and drought events. This requires capacity to respond to increased variability, natural and constructed water storage to offset potentially damaging effects, flood protection infrastructure, and coordinated floodwater management.

Cooperation: Addressing the above opportunities, risks and challenges require higher levels of regional cooperation between all riparian countries, supported by regional organizations, initiatives and programmes, including the MRC, ASEAN, GMS, MLC Water, ACMECS, Mekong-US Partnership, Mekong-Japan Cooperation, and Mekong-ROK Cooperation. There is scope for more focused and effective cooperation among these mechanisms, reducing overlap and duplication, by contributing to each other's strategic and action plans based on a clearer articulation of role, strength, and comparative advantage viz-a-viz other organizations. The evolving relationship between the MRC and MLC Water will be particularly important for the implementation of this Strategy.

With increased basin development and river regulation, the proactive regional planning approach (as described in section 4.2) needs to be supplemented by a greater focus on coordination of operational basin management to reduce transboundary risks of sudden

changes in river water levels, sediment loads and water quality, as described in Section 4.3. All of this requires smarter water-related monitoring and modern information and decision support systems, as described in Section 4.4. The risks and challenges that need to be managed and overcome in order to move towards proactive regional planning and coordinated operational basin management are described in Section 4.5.

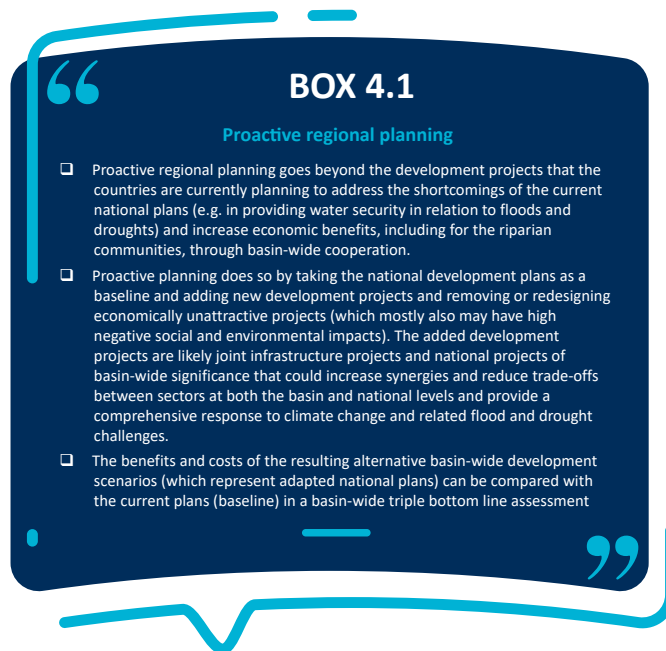
4.2 Need for a more proactive approach to basin planning and joint action

The trade-offs between the economic and environmental dimensions²⁰ of water resources development – in the order of NPV tens of billions – are much larger than needed. They are the result of regional planning reacting to independent national planning based on the same set of development projects that the countries are planning, without any additional new options.

Recent regional (cumulative) impact assessments and strategic studies confirm that national water resources development plans are sub-optimal from a basin perspective as they: (i) cannot individually address the long-term water security and environmental needs of the Mekong River Basin; (ii) lead to an uneven distribution of benefits, impacts and risks; and (iii) miss significant opportunities for coordinated and joint development that could increase economic benefits and reduce impacts and costs.

²⁰ These trade-offs are also likely to have social implications which are less well known.





So far, these assessments and studies have not led to significant changes in nationally planned water resources development as they are sometimes perceived as constraining development rather than enabling it to occur in a more sustainable manner. This concern will be addressed by a more proactive regional planning approach (see Box 4.1). **The more proactive regional planning approach does not only consider postponing or modifying environmentally damaging projects but proposes also new projects for economic and social development and environmental protection.** New project proposals will include:

- **National projects of basin-wide significance**, which create benefits within the country as well as development opportunities elsewhere in the basin, such as: watershed projects (for flow maintenance, enhancing the lifetime of storage reservoirs and contributing to reducing greenhouse gases); the preservation of wetlands including riverine habitats (for enhancing ecosystem services, biodiversity, capture fisheries, and tourism); the creation of inter-seasonal storage for hydropower generation (which, under common operating rules increases dry season flows that can be shared); and projects based on new technology (such as floating solar on hydropower reservoirs); and the relocation of unattractive projects (e.g. a hydropower project from a valuable untouched stream to (storage-backed) hydropower cascades);
- **Joint investment projects (involving two or more countries)**, which address issues and opportunities that one country alone could not do as effectively, such as

floodwater management and water utilisation; the development of multi-purpose hydropower projects (for flood, drought, agriculture, navigation) for adaptation to increased floods and droughts in a transboundary context; the development of transnational parks (for environmental protection and tourism); and navigation (for enhancing commercial navigation and safety). Most joint investment projects will be based on a cost and benefit sharing deal or agreement and lead inevitably to higher levels of transboundary cooperation and regional integration (and thus would advance ASEAN community building objectives).

To operationalize proactive regional planning, this Strategy builds on the existing regional assessments and strategic studies and provides directions for the assessment of a few new basin-wide alternative development scenarios that represent proposed adapted national plans (with added joint and nationally significant projects) to set the countries on a path to more optimal and sustainable development. Regional options assessments in the water-related sectors will inform the formulation of the new scenarios, including on different sustainable and equitable sources of energy. The basin countries will then compare the assessment results with those of the “Planned development scenario” which is based on the current national plans (as assessed by the Council Study and others) in terms of national economic benefits, transboundary impacts, and providing long-term water security and environmental and social needs. This will provide the rationale for each country to consider whether to modify their national plans to greater mutual benefit as part of the regular review and updating of those plans.

While this could have been done years ago, it is not too late. Although major observed impacts, such as the reductions in sediment flow and wetlands, are generally irreversible, there is still a lot to be gained from a more proactive regional planning approach. Given the basin countries’ commitment to optimal and sustainable development, the results of such a proactive planning approach will provide incentives to discuss benefit sharing and trade-offs between national development plans, and thereby to determine the best ways by which to develop the basin given the current circumstances and the legitimate aims and concerns of each country. The results of this new approach will enable the “Development Opportunities” section of the next BDS to provide strategic guidance to national planning for the basin across all water-related sectors for economic development.²¹

This approach will create confidence that water can be allocated and used without unforeseen impacts. This should lead to early engagement of the responsible regional organizations (such as MRC, MLC Water, or both in partnership) in the preparation of large

21 Where appropriate, these discussions may lead to concluding deal structures (agreements) between countries on joint investment project level to capture potential gains to mutual benefit, as in other large international river basins including Senegal, Columbia, Aral Sea and La Plata.

development projects that are agreed in the “Development Opportunities” section of this strategy. These organizations are able to mobilize the expertise and deploy tools that can add value to Terms of References, feasibility studies, ESIA's and the like. in consultation with the governments and relevant parties, with a view to enhancing project benefits and sustainable development outcomes. This earlier engagement will facilitate project consultation and approval processes, such as the PNPCA process.

Such a proactive regional planning approach needs to be implemented by all six countries and multiple sectors in order to aim at 'the greatest good' at basin level. At the technical level, MRCS and the LMC Water Center can support and facilitate joint multi-sectoral expert groups that oversee and steer the assessment of the new scenarios and the preparation of technical papers by a mobilized expert/consultant team. The latter will also prepare the required information for basin-wide discussions among non-government stakeholders, as well as a high-level policy paper for initiating the trade-off and benefit sharing discussions between countries at the senior policy levels. Other regional cooperation arrangements will be engaged in various sectors such as navigation (JCCCN) and energy (GMS Regional Power Trade Coordination Committee) and political/diplomatic support (ASEAN, World Bank and other partners).

4.3 Need for coordinated operational basin management

Some transboundary operational basin management services are already in place in the Mekong River Basin, including flood forecasting and the implementation of the Procedures for the Maintenance of Flows on the Mainstream (PMFM) by the MRC, using hydro-meteorological data provided by the LMB countries and China. As the Mekong River Basin becomes more developed and regulated by dams, and susceptible to more extreme weather events due to climate change, there is increasing need for more data and information sharing and coordination of the following operational basin management needs that may have transboundary aspects:

- **River flow management.** The development of storage capacity in the upper and lower parts of the basin provides an opportunity to manage a substantial and increasing part of the overall Mekong flow volume for equitable socio-economic development, environmental flow needs and mitigation of floods and droughts. To ensure sustainability of all benefits of the river, the water supply-demand balance and sudden water level changes need to be managed within acceptable bounds and communicated to affected countries and people. This requires information sharing on irrigation abstractions and unusual hydropower reservoir inflows and operations (compared to annual operating plans), and in some cases adjustment of reservoir releases;
- **Sediment management.** The consequences of diminished sediment concentrations

on the river's morphology, riverbank erosion, delta building processes, and the productivity of coastal waters and the impacts of these changes on the livelihoods of women and men in the basin need to be fully understood so that agreement can be reached on how best to manage sediments within the system and to mitigate the transboundary impacts of reduced concentrations. In the near term, monitoring and information sharing should be improved regarding sediment trapping and flushing by dams, sediment extraction and riverbank erosion;

- **Management of emergencies**, which include incidents related to water quality (e.g. resulting from accidental spills from a ship or port) and water quantity (e.g. an extreme flood wave caused by improper spillway gate operation or an equipment or structural failure of a dam). With increasing development and erratic climate events, the number of water-related incidents is likely to rise. The management of such emergencies requires information sharing based communication protocols followed by coordination of the response action plan for such incidents. Protocols and action plans need to be developed based on national practices and available regional guidelines. A gender- and vulnerability-responsive approach as envisioned by the ASEAN community needs to be central to all prevention, emergency and post-emergency measures;
- **Design and management of hydropower cascades**. A coordinated design and operation of the increasing number of cascading hydropower dams will improve the benefits and lower the cost of the full utilization of the water resource in the basin and the safe passing of flood waves and flushed sediments through the cascades. Transboundary coordination should support the implementation of existing design guidelines (which relate also to fish passages, navigation facilities, dam quality and safety, and others) and ensure that accurate and timely information sharing among the cascading plants is in place for smooth cascade operations as well as transboundary emergency situations.²²

The responsibility for the above operational basin management needs rests with the designated agencies in the individual basin countries. But as the Mekong River is an international river governed by the *1995 Mekong Agreement*, the basin countries have agreed to cooperate not just in the development but also in the management of water and related resources. Coordination between the countries is needed to realize benefits for other countries (for example through coordination of sediment management) or

22 With more (cascading) hydropower development on the tributaries and mainstream, a higher level of guidelines/rules for coordinated hydropower operation will be needed, including how to address significant modification (if any) of the water resource by new upstream plants in a manner adverse to existing downstream plants, which will increasingly involve technical, environmental, financial and economic aspects.

reduce costs to other countries by early communication of extreme water situations or emergencies, what the impacts could be, where core vulnerabilities lie, and how agencies and the public should respond. Therefore, the MRC will need to focus increasingly on coordination of management and operational issues, supplementing their conventional role in basin planning processes.

The broadening of transboundary coordination of these basin management operations will be explored for the Lower Mekong by the MRC and its Member Countries as well as for the entire Mekong by the MRC and MLC Water, with technical support from the MRCS and LMC Water Center under the recently agreed MoU (see Section 2.5). Both organizations consider the management of flood and droughts and information sharing as their core activities. They will build on ongoing activities between the MRC and China on data and information sharing, technical exchanges, and joint research on unusual and extreme flow conditions. Other regional organizations will need to contribute, such as GMS/ADB on energy related aspects and ASEAN with respect to emergency management and vulnerability reduction. The voices of vulnerable riverine communities need to be heard as they are often the ones most impacted by water resources development and management decisions.

4.4 Need for enhanced data collection, management, analysis and communication, including dissemination

More data and information about the Mekong River Basin is available than in most developing basins, largely due to the past efforts of the MRC, countries and organizations working to develop and protect this great river. Yet with increasing development in the basin and the onset of climate change impacts, the need for enhanced water-related monitoring and information systems is of ever greater importance. Recent inventories show significant overlaps and gaps in the basin's monitoring systems and incompatible information systems at national and regional levels. Basin-wide cooperative action is needed to consolidate and upgrade the monitoring and information systems to a level that is fit-for-purpose for proactive regional planning and operational basin management needs.

The consolidation and upgrading of the basin's monitoring and information systems should be undertaken in a collaborative fashion by the MRC and MLC Water. These organizations could upgrade existing expert groups into basin-wide and joint basin expert groups with representatives of the six basin countries to direct and oversee the work, which may last throughout this strategy period. The joint basin expert group will build on and enhance ongoing activities and arrangements for data collection and information management and sharing among the basin countries. The value of long historical data records should be considered in the process of consolidating and upgrading the monitoring systems.

To increase synergies and reduce costs, the consolidation, upgrading and reinvigoration of the basin's monitoring, information, modelling, forecasting and communication systems, which recently began in the MRC, will be further enhanced with a coherent, basin-wide conceptual plan that all basin countries can agree to. The plan will consider all existing and planned water-related monitoring, data management and modelling systems and facilities, as well as procedures and protocols for sharing of data and information. In all these areas, modern technology and methods, such as high-resolution satellite imagery products and decision support systems, will simplify monitoring requirements with an increasing focus on those key issues that directly affect choices in strategic and operational management of the basin.

Data and information for more proactive regional planning. Most economic, social, and environmental data for regional water resources development planning are being collected and maintained by the basin countries (as they need the same data for national planning purposes). There is a need, however, for a more systematic compilation and transmission of relevant socio-economic data for regional planning purposes, and regular monitoring of the basin's environmental assets, including wetlands and fisheries, and for consistent and spatially disaggregated social and economic data across the whole basin to better identify and support vulnerable communities. Satellite data will help address current data gaps related to land and water use. Field surveys will be needed to support the identification of joint investment projects and projects of basin-wide significance for moving towards optimal and sustainable development (see Section 4.2). The periodic sharing of the required national data will be further improved, based on adapted procedures and modern and compatible information and communication systems (see below).

Data and information for transboundary operational management. There is considerable scope for prioritization, re-alignment, and enhancement, as well as removal, of redundant hydro-meteorological stations and sediment and water quality sampling locations to enable a more cost-effective overall monitoring effort in the Mekong River Basin. As before, the basin countries, with their partners as appropriate, will finance and manage the resulting redesigned network of monitoring and sampling locations, and collect the data according to agreed protocols and methodologies and share those with regional water actors for regional flood/drought forecasting and coordination of transboundary flow management, sediment management, management of hydropower cascades, and emergency situations in accordance with agreed procedures.

To improve management of the mainstream, a **core monitoring network of stations and sampling locations** on the Mekong mainstream²³ will be managed by the MRC with operational decentralisation of data collection functions to the basin countries. MRC would

23 The main tributaries could be added later as needed.

finance this core monitoring network in the LMB, using the HYCOS telemetry network with aligned discharge measurements and water quality and sediment sampling in an integrated monitoring and assessment methodology. The emerging Joint Environmental Monitoring (JEM) will be integrated in the core monitoring network. The core network will also enhance emergency management and flood forecasting. This approach may lead to a more cost-effective monitoring effort overall. It also would strengthen MRC and its RFDMC as a regional knowledge hub and centre of excellence.

In addition to a core monitoring network, the MRC will cooperate with MLC Water to establish a **central monitoring coordination function** to promote harmonization across the basin and support the six countries in the collection and storage of various types of data: hydro-meteorological, discharge and sediments, water quality, fish catch and effort, riverine health (plankton, invertebrates etc.), and on wetland and forest habitats. This function will link the collection, storage and accessibility of data with the integrated regional assessment, planning and operational management work done centrally by the MRC in collaboration with MLC Water. It will also help minimize any duplication of effort and ensure all data is collected only once but then used for multiple purposes at the national and regional level.

Data and information for analysis and communication. There is a need at the national and regional level for compatible and modern decision support systems (DSS) that are connected to monitoring stations, earth observation data providers, and other data centres to support water management across time and spatial scales. These compatible systems would enable the implementation of all core river basin functions including online monitoring, real time river management, emergency management and communications, flood forecasting and early warning, drought forecasting and management, reservoir operations, water allocation, seasonal forecasting, reservoir and river sedimentation management, river maintenance for navigation, water and environmental planning, agricultural planning, longer-term planning of infrastructure development, and climate change adaptation and vulnerability reduction.

Some basin countries are leading the way and have already installed a modern DSS in large tributary basins systems, while the MRC is upgrading its data and modelling systems towards the highest international standards. They will promote and support the development of similar systems in the other countries, which will dramatically improve data and information analysis and sharing capabilities among the countries. Having a modern DSS will also create the opportunity for each country to verify regional modelling and assessment results and test new proposals for water resources development and management. The latter will increase trust and confidence among the countries to discuss and negotiate joint and significant projects at the regional level.

The Mekong River Basin Indicator Framework (MRB-IF)²⁴ will be rolled out in the entire basin. The MRB-IF with strategic indicators, assessment indicators and supporting monitoring parameters offers a systematic and consistent approach to data collection and analysis for regional and national planning. The MRB-IF will be periodically updated to balance the data needs for basin planning and management, on the one hand, and the practicalities and costs, on the other. The agreed MRB-IF is supported by a data acquisition and generation action plan which provides clarity on what should be provided by whom and when. The MRB-IF will also drive a more comprehensive implementation of the MRC Procedures.

Towards one river basin information management system. The process of cooperation on regional planning, operational basin management and supporting monitoring and information systems will inevitably lead to improved implementation of the MRC procedures and further data and information sharing between upper and lower part of the Mekong River Basin. Ultimately, with increasing regional economic integration and trust, there should be one river basin information management system for the Upper and LMB by 2030.

4.5 Strategic risks and challenges

Strategic risks

The overarching risk that could diminish the effectiveness of the implementation of this Strategy is related to cooperation between the countries and their regional water cooperation platforms, the MRC and MLC. The higher level of practical cooperation that is required may not be achieved in the near term because sufficient trust and confidence may yet not materialize among all parties to move towards basin-wide proactive planning and transboundary cooperation on basin operations. People in downstream countries have concerns that increasing upstream water storage could be used against them by holding dry season flows, while upstream countries are concerned over constraints on sovereign actions and water resource utilization without adaptation to changes.

There is no easy remedy for insufficient trust. In other international river basins, common understanding and trust come with increasing regional integration. While this is never easy to achieve, taking steps along this pathway will provide positive feedback that creates new opportunities, including through ASEAN community building. Much depends on the political commitment of the basin countries and the technical and diplomatic skills

²⁴ Formerly known as the MRC Indicator Framework. It is more appropriately called MRB-IF as the indicators applied for the whole basin and not just the MRC.

of the leadership within the MRC and MLC to drive a practical process towards achieving this Strategy's aims. Important will be also a systematic multi-stakeholder engagement (which includes non-government actors) that builds towards consensus and agreements on water resources development and management in the basin, as well as more openness from countries and developers, and addressing unbalanced and incorrect journalism and advocacy (which can feed mistrust and affect regional relations) by providing factual and even-handed information and advice (see lessons learnt in Section 1.4).

If the level of regional water cooperation is not stepped up, opportunities will be missed to increase regional benefits and reduce costs by coordinated national planning and joint investments in water resources development and management. Furthermore, the following economic, environmental and social risks may become reality:

- **Loss of lives and infrastructure** in urban and industrial areas of the Mekong Delta due to lack of coordinated investment in flood protection leading to higher overall costs to everyone (needs coordinated floodwater management);
- **Insufficient increase in inter-seasonal water storage** to keep up with increasing water uses in a future climate with dryer dry seasons (planning for inter-dependent development of storage and further consumptive uses in the basin, and the sharing of the resulting dry season flows);
- **Loss of livelihoods and food security in poor resource-dependent communities** before economic development gradually lifts them out of poverty and accommodates change in livelihoods (needs planning for postponing or relocation of projects with large negative impacts as often such projects are also economically unattractive);
- **Stranded hydropower projects** because electricity supply runs ahead of demand, or lower than anticipated dry season flows, or expansion of new technology, leading to unreliable, loss making hydropower projects with higher electricity costs for consumers (needs harmonization between water and energy sector planning and the development of hydropower in storage-backed cascades);
- **Critical loss of remaining wetland and floodplain habitat** reducing ecosystem services, such as flood absorption and fish habitat (needs regional planning and a whole-of-landscape approach, which is urgent in a rapidly changing basin due to developments within and outside the water sector);
- **Higher future cost of water security projects** due to ongoing and planned (water) infrastructure developments in areas and locations that may be needed in future for (joint) projects to build climate resilience and manage flood and drought risks (needs planning to identify these areas as well as the scope of such future projects, followed by spatial planning reservation);
- **Higher cost of riverbank and coastal protection** and other costly measures to

address the impact of sediment starvation (requires regional agreement on the implementation of a basin-wide sediment management strategy);

- **Larger impacts of water-related accidents and operations** due to accidental spills of toxic substances, dam breaks, uncoordinated hydropower operations, and uncoordinated river training works and navigation operations (requires coordination of basin management operations, communication and data sharing protocols, and gender- and vulnerability-responsive action plans for prevention and response).

Main challenges

The main challenges identified in addressing the needs and risks described in this Strategy are related to the implementation process and based on experiences and lessons from previous planning cycles. There are no major technical challenges. Because of significant investment in data acquisition and knowledge over many years, the Mekong region is more prepared than most other developing basins to implement the proposed proactive regional planning and operational basin management. There is a need, however, for further institutional alignment at the basin level for the sustainable management of the basin's water resources, to address the uneven distribution of knowledge and capacity between countries, and continue to build trust and confidence in the added-value of basin-wide cooperative action for each country.

Institutionalising mechanisms for all six basin countries to cooperate effectively. Establishment of joint basin expert groups is an important and practical mechanism to guide and oversee pro-active regional planning, coordinated basin management operations, and the consolidation and upgrading of the basin's monitoring and information systems. The challenge will be to extend MRC's current expert groups consisting of LMB representatives of key line/implementing agencies to joint basin expert groups (one for planning, one for monitoring/information systems, and one for coordination of basin operations) with technical leaders from all six basin countries through cooperation with MLC Water. The establishment and operation of joint basin expert groups will replace MRC's expert groups. A further challenge will be to develop the institutional mechanisms, capacity and consistent membership within the key line/implementing agencies so that the joint basin expert groups (and their agencies) will gradually take over many activities that are currently dependent on consultants and the financial support of donors.

Levelling the implementation capacity between Member Countries. Implementation of this Strategy requires new approaches and technologies related to data collection and information systems, modelling and planning at different time scales, development of joint and significant national projects, information sharing and communication, and supervising infrastructure development and operations companies. This is a challenge as training in these areas cannot be simply outsourced. It must be tailored to the specific

conditions of the Mekong River Basin and directly relevant to achieving the outcomes sought by this BDS.

Different capacity among basin countries provides an opportunity for greater use of country-to-country knowledge sharing and capacity building. Each significant activity and project related to the BDS should have a capacity building component which uses a mix of mechanisms such as (i) targeted training and workshops for immediate use and timed to the operations of the joint expert groups (see above); (ii) on-the-job learning by national experts, coached by other riparian experts on the actual implementation of the regional planning and information management activities (which could be contracted out); (iii) secondments and temporary transfers of experts; and (iv) exchange visits, once ideas and proposals are developed for the Mekong, to see first-hand how pro-active regional planning and operational basin management is practised in other large river basins.

Addressing inequities associated with gender and vulnerability. All basin countries have made significant progress in social development and gender equality during the last decade. Nevertheless, there are still substantial gaps and inequities as well as externalities that require focused action. The latter is a challenge since gender disaggregated data is scarce and existing data are often not linked effectively and timely with decision-making processes and budget allocations. This multi-dimensional data gap needs urgent addressing by the basin community. In this BDS, gender has been mainstreamed in the BDS results chain according to gender equality and vulnerability considerations. The defined Outcomes and Outputs under Strategic Priority 2 address the considerable gender and vulnerability related data gaps and aspects of basin water, food and energy security (see Sections 5.3 to 5.5). The BDS also calls for specific measures that directly aim at the reduction of inequity and vulnerability as well as externalities, such as gender and vulnerability and local expertise in the proposed Joint Basin Expert Groups. ASEAN is also actively supporting member states in addressing gender issues that will contribute to the achievement of BDS Outcomes and Outputs.

Enhancing the capacity to manage floods and droughts effectively. The current capacity to manage floods and droughts effectively is limited in the Mekong River Basin. Storage on floodplains has been reducing due to development and inter-seasonal storage behind dams is less than 15% of mean annual runoff. This Strategy promotes coordinated floodwater management and the creation of additional storage in wetlands and behind dams to build climate resilience and manage flood and drought risks. This is a challenge as suitable storage areas have been disappearing due to wetland reclamation, population growth in potential reservoir areas, and the construction of dams and other infrastructure that are now in the way of more optimal infrastructure. The remaining options for increasing natural and constructed water storage (using GIS/EO technology) need to be identified and assessed through the proposed regional proactive planning before they are gone. Additional flow thresholds may be needed to protect the flow reversal to the Tonle Sap Lake and other benefits of the Mekong's high inter-seasonal variability will be preserved.

Demonstrating regional plans and discussions on trade-offs as opportunities for win-win outcomes rather than as a threat to national sovereignty. A regional planning and management approach should add value to national plans by presenting opportunities to increase the overall benefits and decrease the overall costs (i.e. make the pie bigger). Demonstrating this value in a rigorous and transparent way while supporting discussions around cost and benefit sharing between countries and/or sectors can be challenging, particularly where there are uncertainties in the science and models underpinning the analysis, and where there is a lack of trust between parties. Finding new ways to present information and receive input, avoiding 'black box' models and tools, being open about assumptions and uncertainties, using trusted third parties, and involving key personnel throughout the process in a truly collaborative way are just some of the tactics that will be important to overcome this challenge.

Coordinating multiple actors at several levels and across different sectors. Integrated water resources management is by definition multi-sector and multi-stakeholder. Increasingly, development in the basin requires the involvement of more than one ministry at a national level (such as water and energy) and at more than one level of government (such as national, provincial and local). At a regional level there are more actors involved (such as now including MLC). Questions about overlapping mandates, regional versus national versus sub-national prerogative, which organisation(s) is best placed to lead, contribute, or rather focus its efforts elsewhere need to be resolved quickly and with all parties focused on outcomes for the basin as a whole and the people that live there. Coordination needs to be strengthened, informed by a strong understanding of existing institutional and governance systems throughout each basin country, the strengths, weaknesses and priorities of different parties, and the political context and drivers of change.

Strengthening national implementation. Achieving outcomes from almost all regional activity in relation to water resources management and development is ultimately dependent on implementation at a national level where there is much outside the water sector which ultimately impacts on what can be achieved in the water sector. The effectiveness of national implementation depends on an alignment of interests and priorities, human and technical capacity, available resources, good governance, strong institutions and a sound regulatory environment, compliance assurance and enforcement, and international, national and local politics. Often engaging in these areas is beyond the scope of water resources management and development and so requires the strong support of development partners and countries working closely together to strengthen national systems and institutions more broadly.

The global economic impact of the new coronavirus (COVID-19) will be severe and even if resolved quickly, likely to have ripple effects at least throughout the initial BDS implementation period. These effects may have implications for the viability of planned

investments in water resources development and the relative value of different energy generation and food production options. Policy measures aimed at a rapid return to growth have the potential to exacerbate inequalities and environmental degradation, but the situation also offers scope for new thinking and the reinvigoration of a more integrated and sustainable water resources management – basin-scale and multi-sectoral. The water sector has an important role to play in the recovery from COVID-19 and for suppression and prevention of similar diseases through the provision of safe water, sanitation, and hygienic conditions (WASH) and measures that strengthen water security, environmental protection and the livelihood opportunities of people in vulnerable situations.







BASIN DEVELOPMENT PATHWAYS

Considering the strategic needs, risks and challenges described in Chapter 4, the Basin Development Pathways set out sustainable development opportunities and a results chain directed at achieving the Basin Vision and the SDGs most relevant to regional water resources management and development in the Mekong River Basin (Figure 5.1).



Figure 5.1. Overview of the Basin Development Plan results chain including the Vision, relevant SDGs, strategic priorities, basin Outcomes, and some of the key Outputs

5.6 Shared Mekong River Basin Vision towards 2040

The Mekong River Basin Vision identifies among the countries of the basin a shared long-term aspiration for the future. The Vision itself is an enduring one. It represents an ongoing ambition to achieving progress in the lives of the people of the basin in support of peace, security and societal harmony. The Mekong River Basin Vision is of:



An Economically Prosperous, Socially Just, Environmentally Sound and Climate Resilient Mekong River Basin

The Mekong River Basin Vision embodies **a balance** between economic development, social justice and environmental integrity, with climate resilience a cross-cutting focus. All dimensions are **equally important** to achieving the sustainable development, utilisation, and conservation of the basin's water and water-related resources.

Towards 2040 the four dimensions of the Vision are described below, as informed by national inputs and the SDGs most relevant to water resources management and development.

Economically Prosperous

The Basin of 2040 is one with substantially higher GDP and higher incomes for the people that live there. Inclusive economic growth is driven by the continued shift to industrial and service sector led economies, creating opportunities for all groups and helping eradicate

poverty. Agriculture is more productive and globally competitive with an emphasis on higher value and green produce, using improved technology. Navigation enables people and bulk goods to move long distances cheaply, safely and environmentally friendly. Energy generation from hydropower and other renewable sources provides low-carbon, reliable and affordable electricity for all. New economic potential is realised in nature-based tourism, leveraging the basin's unique environment and culture.

Socially Just

The Basin of 2040 is one where the benefits of water resource development are shared with the people impacted by those developments, in order that sustainable livelihoods for all people are possible. There is less direct dependence on water-related resources as people previously in vulnerable situations have opportunities to earn higher incomes in other sectors and increase their standard of living. The Basin is food, water and energy secure and economic growth is inclusive. Men and women have equal opportunity to realise their full potential through access to and control of economic resources.

Environmentally Sound

The Basin of 2040 is one where people live in harmony with nature, where the remaining environmental assets, especially the important wetlands and natural forests, are protected from further decline. Natural resources are managed sustainably within ecological limits so that ecosystem services including flood and drought protection are maintained for the benefit of the countries' economies and people. The basin remains one of the world's most biodiverse places with sufficient habitat and regulatory controls to arrest the decline in species. Watersheds serve an important role as refuge for plants and animals, regulating runoff and groundwater recharge and reducing soil erosion.

Climate Resilient

The Basin of 2040 has enough water during the dry season to minimise the effect of droughts while salinity intrusion in the delta is not materially worse, even as sea-level rises. Water is of good quantity and quality to enable sustainable development while minimising water-related disasters. Flood impacts are less severe through a combination of upstream reservoirs, protected floodplain areas, and by coordinating the design, location, construction and operation of flood protection infrastructure. Transboundary flood management effectively operates as a single integrated system between countries.

The above dimensions of the Mekong River Basin Vision towards 2040 – all based on national inputs and the SDGs – guide the development of the results chain defined in Sections 5.3 to 5.5.

5.7 Sustainable development opportunities

The sustainable development opportunities below represent a substantial broadening of the opportunities in the previous editions of the BDS, which were negotiated by the Member Countries in 2010. Since then, the Mekong River Basin conditions and outlook has changed significantly, as described in Chapter 3. New information has become available on development opportunities and associated risks. The perceptions of national and regional stakeholders on water-related needs and priorities are changing.

As a result, development opportunities have been added for the restoration and management of riverine and wetland habitats and watersheds. The provision of water security to protect societies from water risks, especially floods and droughts, now figures prominently among the development opportunities, both as part of other sector investments and as a development opportunity in its own right. In all development sectors below, this Strategy promotes the development of joint investment projects between two or more countries and significant national projects that create benefits within the country as well as opportunities elsewhere in the basin.

Hydropower development

There is potential for further development of hydropower to promote energy security and cross-border trade and contribute to flood and drought management and a low-carbon economy. There are also opportunities for operational improvements to existing hydropower facilities to moderate downstream risks due to flood peaks, water level fluctuations and sediment trapping.

This Strategy promotes the concentration of hydropower development in storage-backed cascades to: (i) increase dry season flows and power generation, (ii) provide reliable flows to downstream run-of-river hydropower facilities and improve their performance, (iii) reduce downstream flood and drought risks and enhance dry season navigation, and (iv) create opportunities to forego hydropower development in still undeveloped watersheds with high ecological value. Going beyond the national plans, regional proactive planning will identify storage-backed and joint investment projects, with multiple purposes including hydropower, flood and drought management, navigation, and tourism.

Further utilising this opportunity requires a focus on sustainability and addressing risks and uncertainties both at project and transboundary levels. Potential transboundary impacts will need to be identified and mitigated collaboratively through national regulatory frameworks and guidelines, as well as applicable regional procedures and guidelines. To enhance sustainable development, any new power generation plans should consider the full range of viable generation sources, including complementary use of wind and solar, and ensure that supply does not run too far ahead of demand.

Irrigated and climate smart agriculture development

There is an opportunity for increased dry season flows resulting from hydropower developments to be used to expand irrigation without affecting the historical baseline flow. A possible diversion from the mainstream into Northeast Thailand is one option that has been identified. Modernising and expanding irrigated areas, changing cropping patterns, and moving towards climate-smart agriculture to improve efficiency, increase agricultural production and improve value chains, will help achieve drought protection and improve household food and water security needs. There may be opportunities also for expansion of groundwater-based irrigation powered by the expanding electricity grid or local solar generation.

To further capitalize on this opportunity and mitigate the risks to flow and sediment regimes requires proactive regional planning for inter-dependent development of storage and further consumptive uses in the basin, and the sharing of the resulting dry season flows, without affecting minimum flows agreed under the PMFM. Determining how to share any additional dry season flows, including in relation to expanding irrigated agriculture or mitigating the effects of increased salinity intrusion on existing agriculture, should be informed by analysis of the potential impacts of climate change in different parts of the basin and the overall regional costs and benefits from different uses.

Navigation development

There is considerable potential throughout the mainstream for the further development of inland water transport (IWT) as an integrated, effective, safe and environmentally friendly way to move people and goods. This opportunity can be realised by taking advantage of greater water depth in the dry season and continuing to implement the existing IWT plans for the upper, middle and lower parts of the river. Elevated water levels due to hydropower dams may assist development of navigation in Lao PDR and Cambodia, but only if dams are sited to also suit IWT.

The investment opportunities for the navigation sector occur in many areas, ranging from waterway improvements (such as dredging, river works, and so on) to navigation aids and port development. Capitalizing on the opportunities requires the implementation of a Strategic Environmental Assessment (SEA) of the IWT plans, which steers environmental and social impact assessments for specific port and terminal constructions and waterway improvement projects. Major risks need to be fully addressed while basin countries consider and address jointly the transboundary impacts through national regulatory frameworks and guidelines, as well as applicable regional procedures and guidelines.

Leveraging the value from regionally significant environmental assets

There are opportunities to rehabilitate and improve the management of forested areas in watersheds to enhance the lifetime of storage reservoirs, protect biodiversity and contribute to reducing greenhouse gases in the atmosphere. There are also opportunities for preservation, restoration and leveraging of the remaining wetlands and other riverine habitats for ecological (biodiversity), economic (nature-based tourism, fisheries), social (ecosystem services, social wellbeing), and climate change adaptation (flood and drought mitigation) purposes.

This Strategy supports the identification, selection and preparation of investment opportunities in these environmental assets through proactive regional planning as informed by asset and ecosystem services valuation and the determination of the limits of acceptable change to ecological conditions. There are also opportunities for joint transboundary projects including to support biodiversity corridors and to regulate dry season flows and groundwater recharge. This Strategy also supports regional cooperation to improve the capacity of countries to take advantage of innovative financing arrangements, such as attracting foreign carbon offsetting funds for reforestation of watersheds.

Flood and drought mitigation

There is a need for further flood risk reduction of urbanized and industrialized areas through national and joint investment projects related to a combination of upstream storage reservoirs (in combination with hydropower development), designating certain critical floodplain areas for conveyance of floods, and infrastructure such as embankments and flood ways. The increase in upstream storage will also contribute to mitigating droughts in a future climate with dryer dry seasons. Joint investment projects will likely be needed to mitigate flood and drought risks to acceptable levels in various parts of the basin.

Early planning is required as solutions will become much more difficult and costly with time due to ongoing developments in areas that might be needed in future for projects to build climate resilience and manage flood and drought risks. This Strategy supports a basin-wide, integrated approach to flood and drought management through proactive regional planning and flood risk management activities in the Mekong Delta. Such an approach requires detailed modelling and analysis of the movement of water across the floodplain and the assessment and prioritization of options and measures for flood protection, considering climate change (including sea level rise), the ecological benefits of floods, socio-economic development plans, and the rising cost of flood damage in expanding urban and industrial centres.

Sustainable livelihoods

Water resources development impacts some poor, resource dependent communities more than others. Some groups within communities, particularly women, are also often in more vulnerable situations. There is therefore an opportunity to reduce inequities and achieve greater social inclusion by facilitating the transition of these people to situations where they are less directly dependent on natural resources for their income and sustenance. The investment in sectors with high potential to decrease gender inequality will be important to reduce vulnerabilities and inequity. Many of these opportunities will exist outside water-related sectors. Targeted investment in key areas will be needed to ensure the people most affected by water resource development will benefit from gains in employment and economic growth resulting from the above development opportunities and the broader transition to an industry and service-led economy. The identification, selection and preparation of investment opportunities in conjunction with joint investment projects and national projects of basin-wide significance will have a multiplier effect on the benefits of water resources development.

Fisheries and aquatic resources

Capture fisheries in the basin are under threat and new investment opportunities in fisheries and other aquatic resources will need to be explored along with associated measures to minimise the potential adverse impacts of changed basin conditions on food security. In addition to the habitat protection and rehabilitation opportunities mentioned above, enhanced fish stocking of reservoirs, and the expansion of aquaculture, particularly small-scale aquaculture accessible to vulnerable people in conjunction with support for sustainable livelihoods, are options that may need to be considered.

Utilising this opportunity requires substantial investment in infrastructure, know-how and regulatory measures to ensure successful captive breeding programmes and sustainability concerns related to water quality, disease, pests, and invasive species can be successfully managed. Other policy measures may also be required to facilitate access to markets and growth in demand for different species of fish and other aquatic animals.

Other opportunities

Other water-related opportunities, such as public and industrial water supply, more sustainable sediment extraction, timber floating, recreation and tourism, as well as opportunities beyond the water sector (such as alternative power generation options), also have considerable potential.

5.8 Sustainable Development Goals

The Strategic Priorities and Outcomes for basin development and management in the next sections are directed at contributing to the achievement of relevant SDGs. Water resources development and management can contribute to *No Poverty* (Goal 1), *Zero Hunger* (Goal 2), *Good Health and Well Being* (Goal 3), *Gender Equality* (Goal 5), access to *Clean Water and Sanitation* (Goal 6) and *Affordable and Clean Energy* (Goal 7). At the same time, the following Goals are supported by actions taken in water and water-related sectors: *Decent Work and Economic Growth* (Goal 8), *Industry, Innovation and Infrastructure* (Goal 9), *Reduced Inequalities* (Goal 10) *Climate Action* (Goal 13), *Life Below Water* (Goal 14), and *Life on Land* (Goal 15). *Partnerships for the Goals* (Goal 17) are essential to achieving the other goals, including through regional cooperation in the basin.





Figure 5.2. Different SDGs that the BDS will contribute to achieving

Although all the above SDGs are relevant to the Mekong River Basin Vision, the targets and indicators specified for each Goal can be used to identify those most impacted by regional cooperation on water resources through the BDS (Table 5.1). Goals not indicated below, are addressed indirectly based on the extent to which they are mainstreamed into the other goals or result from progress made towards those goals with more direct links to water resources management.

Table 5.1: SDGs with targets most directly relevant to regional water resources development and management in the Mekong River Basin

MRB-IF Dimension	SDGs	Targets
Environment	 	<p>6.6 Protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes</p> <p>15.1 Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements</p> <p>15.9 Integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts</p>
Social	    	<p>1.b Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions</p> <p>2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality</p> <p>5.c Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels</p> <p>6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all</p> <p>6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations</p> <p>17.18 By 2020, enhance capacity-building to developing countries ... to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts</p>
Economic	   	<p>2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality</p> <p>7.2 By 2030, increase substantially the share of renewable energy in the global energy mix</p> <p>8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value</p> <p>9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all</p>
Climate Change	 	<p>1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters</p> <p>13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries</p> <p>13.2 Integrate climate change measures into national policies, strategies and planning</p>

MRB-IF Dimension	SDGs	Targets
Cooperation	 	<p>6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate</p> <p>17.9 Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the SDGs, including through North-South, South-South and triangular cooperation</p> <p>17.14 Enhance policy coherence for sustainable development</p>

5.9 Basin Development Strategy priorities and results chain

As the BDS aims to put actions in place to improve the overall state of the Mekong River Basin, the result chain of the BDS, and the corresponding MRC Strategic Plan, is formulated in accordance with the five dimensions of the SOBR and indicators of the MRB-IF, and relevant targets of the SDGs. The five Strategic Priorities, one for each dimension of the MRB-IF, and all of equal importance, are as follows:

- 1. Environment:** Maintain the ecological function of the Mekong River Basin
- 2. Social:** Enable inclusive access and utilisation of the basin's water and related resources
- 3. Economic:** Enhance optimal and sustainable development of water and related sectors
- 4. Climate change:** Strengthen resilience against climate risks, extreme floods and droughts
- 5. Cooperation:** Strengthen cooperation among all basin countries and stakeholders

Under each Strategic Priority, a few Outcomes are anticipated as the resulting end state that basin countries would like to see by 2030. They are aligned with the Strategic and Assessment Indicators of the SOBR and MRB-IF and their achievement will be evaluated using the MRB-IF indicators. Under each Outcome, several Outputs are identified as the immediate results, produced through an identified impact pathway. Each Output will be produced by one or more actors implementing one or more activities. The activities will be defined and identified in the strategic plans or action plans of each relevant actor, such as the MRC.

This section describes the Strategic Priorities and outlines the Outcomes and Outputs for each Strategic Priority in each dimension.

Environment Dimension Results Chain

Strategic Priority: Maintain the ecological function of the Mekong River Basin

The Mekong’s ecological function must be maintained in good condition. The Mekong River Basin’s environment is being heavily modified, placing the ongoing viability of some important ecosystems and dependent biota such as fish, at risk. These ecosystems include river and wetland habitats and forested watersheds, all of which provide valuable provisioning, regulating, supporting and cultural services to the countries and people of the basin, contributing to sustainable economic development. The most critical issues to be addressed over the period to 2030 are changes in water flow conditions, reduced sediment transport due to dams and sediment extraction, the loss of remaining wetlands and unsustainable management of watersheds.

To address these issues requires action at both regional and national levels. It will be important to identify the limits of acceptable water-related change for priority environmental assets to avoid the potential negative impacts of water resource development, and to work together to mitigate the transboundary impacts from development that are already evident. A focus on sediment transport is necessary to help minimise regional costs from riverbank erosion and potential loss of wetland and floodplain productivity. More sustainable watershed management will help protect biodiversity, while supporting dry season flows and power generation. Healthy wetlands provide flood protection, improved water quality and important fish habitats. Sustainable fish populations are essential to the food security and livelihoods of people in vulnerable situations.

The Outcomes and Outputs focus on water flow conditions, sediment and environmental assets (wetlands and watersheds). They seek to ensure that by 2030, the environment continues to provide important ecosystem services, supporting food security and livelihoods, especially of people in vulnerable situations.

Strategic Priority 1: Maintain the ecological function of the Mekong River Basin		
Outcomes	Outputs	Contribution to other Outcomes
1.1 Adequate water flow and quality for a healthy environment and productive communities	1.1.1 Guidance for water flow and quality management implemented	Outcome 1.2, 1.3
	1.1.2 Guidance and measures for impact mitigation of water infrastructure implemented	Outcome 2.1, 2.2
		Outcome 3.1, 3.2
		Outcome 4.1

1.2 Sediment transport managed to mitigate bank erosion and maintain wetland and floodplain productivity	1.2.1 Basin-wide sediment management plan developed and implemented	Outcome 2.1, 2.2 Outcome 3.1, 3.2 Outcome 4.1
1.3 Ecosystem services from wetlands and watersheds ensured	1.3.1 Limits of acceptable change for key river and connected wetland habitats identified and implemented 1.3.2 A basin-wide planning and management framework for watersheds developed and implemented	Outcome 3.1, 3.2 Outcome 4.1

Social Dimension Results Chain

Strategic Priority: Enable inclusive access and utilisation of the basin's water and related resources

Water resources development tends to exacerbate inequality. Poor, resource dependent people in vulnerable situations bear the most risk due to a lack of alternative livelihoods and adaptive capacity. Gender differences in access to water and related resources, as well as opportunities from water resources development need to be better understood so that measures can be put in place to promote equity and achieve food, water and energy security for all consistent with the SDGs and basin country commitments to fundamental human rights. Improving our understanding of these issues will require a concerted effort to enhance information and knowledge, supported by the collection, sharing and analysis of spatially distributed and gender disaggregated data. As policy makers better understand the needs and opportunities of people in vulnerable situations who are impacted by water resource development, strategies for alternative livelihood development can be designed and implemented, including through joint investment projects and national projects of basin-wide significance.

The Outcomes and Outputs focus on food, water and energy security for women and men while helping poor, resource dependent communities achieve sustainable livelihoods with higher incomes. They seek to ensure that people, especially those in vulnerable situations, can meet their basic needs while sharing in the benefits of basin water resource development. Food security is addressed, in particular, through improving management of fisheries and addressing the risks to capture fisheries from a range of threats.

Strategic Priority 2: Enable inclusive access and utilisation of the basin's water and related resources

Outcomes	Outputs	Contribution to other Outcomes
2.1 Strengthened water, food, and energy security for basin community well-being	2.1.1 Access and supply of safe water to people in vulnerable situations improved	Outcome 1.3
	2.1.2 Capture fisheries regulatory frameworks improved to support food security	Outcome 2.2
	2.1.3 Risks to capture fisheries productivity and diversity minimised to support food security	Outcome 3.2
	2.1.4 Gender and vulnerability aspects of basin water, food, and energy security addressed	Outcome 4.1
2.2 Increased employment and reduced poverty among vulnerable people dependent on river and wetland resources	2.2.1 Alternative and sustainable livelihood strategies for poor, resource dependent communities impacted by water resources development and management prepared and mainstreamed at national levels	Outcome 2.1

Economic Dimension Results Chain

Strategic Priority: Enhance optimal and sustainable development of water and related sectors

Separate national development plans, designed and implemented in an uncoordinated way, are unlikely to optimise the benefits and minimise the costs for basin countries. Sustainable development and water security for all basin countries could be enhanced by identifying and implementing opportunities not yet considered in national plans, including significant joint investment projects and projects of basin-wide significance, with a view to achieving a better overall outcome across sectors and between communities, including protection against major floods and droughts. Projects across all dimensions of this BDS need to be identified, alternative scenarios assessed, and information made available for consideration by national decision-makers in updating national plans. This information can also support discussions between basin countries about trade-offs, risks and benefit sharing.

Such a proactive approach to regional planning, if implemented effectively and integrated within national development planning processes, will achieve higher and potentially more sustainable economic growth in each country than would otherwise be the case from implementing separate and uncoordinated national plans. As the economy of the region is increasingly integrated, cooperation in water-related sector planning and management through the implementation of regional sector strategies can also help enhance the economic sustainability of individual sectors including through greater use of low emissions technology and renewable energy, and build climate resilience and manage flood and drought risks.

The Outcomes and Outputs focus on enhancing national plans through proactive regional planning and helping improve water security and the economic value of water-related sectors through regional cooperation. They seek to ensure economic growth is higher and more sustainable across the region than it otherwise would be based only on uncoordinated national plans.

Strategic Priority 3: Enhance optimal & sustainable development of water and related sectors		
Outcomes	Outputs	Contribution to other Outcomes
3.1 Increased economic growth of all basin countries from more proactive regional planning	3.1.1 The Basin Development Plan and associated national plans are informed by the findings of a more proactive regional planning approach	Outcome 1.2, 1.3 Outcome 2.1, 2.2 Outcome 3.2 Outcome 4.1, 4.2, 4.4 Outcome 5.1
	3.2 Enhanced inclusive growth and sustainability in irrigated agriculture, hydropower, navigation, environment and fisheries sectors	
	3.2.1 Irrigated agriculture investment and associated measures implemented	Outcome 1.1, 1.3 Outcome 2.1, 2.2
	3.2.2 Sustainable hydropower development strategy and related regional energy plans implemented in synergy	Outcome 3.1
	3.2.3 Basin navigation plans implemented in synergy	
	3.2.4 Regional environmental strategies and programmes implemented in synergy	
	3.2.5 Investment and associated measures to adapt to changes in fish populations and catch composition identified and implemented	

Climate Change Dimension Results Chain

Strategic Priority: Strengthen resilience against climate risks, extreme floods and droughts

Floods and droughts cause severe economic and social hardship, particularly on poor and marginalised communities. Climate change has the potential to exacerbate the frequency and severity of both floods and droughts with more people and assets at risk due to population growth and floodplain development. Basin countries need to take steps to increase water security – mitigating the impacts of too much water at certain times of year, while not having enough at other times – and ensure communities are as well prepared as possible to adapt to the changing circumstances. Opportunities for upstream and floodplain storage, including through the implementation of nature-based solutions will be considered through proactive regional planning (Output 3.1.1) along with cooperation on floodwater management including the coordinated operation of instream and flood protection infrastructure. A coordinated design and operation of the increasing number of cascading hydropower dams and other water infrastructures will improve the benefits and lower the cost of the full utilization of the water resource in the basin and the safe passing of flood waves and flushed sediments.

Central to strengthening the resilience of basin communities and adapting to climate change and climate variability is to improve information on changing river conditions through enhanced monitoring, forecasting and early warning systems. Progress on harmonisation of disaggregated data collection and sharing, notification of water releases, agreed infrastructure operating protocols, and integrated decision support systems will all be beneficial to achieving one overall basin planning and management system.

The Outcomes and Outputs focus on supporting community preparedness for the impacts of climate change through improved information about changing river conditions and more frequent and severe droughts, as well as enhancing operational management and climate change adaptation planning at national levels. By 2030, it is expected that national plans will incorporate options for making increased dry season flows available to support livelihood activities and mitigate salinity intrusion, and for mitigating flooding using both in-stream and floodplain storage.

Strategic Priority 4: Strengthen resilience against climate risks, extreme floods, and droughts

Outcomes	Outputs	Contribution to other Outcomes
4.1 Better informed and prepared basin communities against changing river conditions, and more frequent and severe floods and droughts	4.1.1 A core river monitoring network for the mainstream and remaining national river monitoring networks consolidated	Outcome 1.1, 1.2, 1.3
	4.1.2 Integrated data and information systems for more effective basin-wide data management and sharing	Outcome 2.1, 2.2
	4.1.3 Compatible Decision Support Systems building on reinvigorated data, modelling, forecasting, and communication capabilities	Outcome 3.1, 3.2
	4.1.4 Integrated basin-wide flood and drought forecasting and early warning	Outcome 4.2
	4.1.5 Joint State of Basin Report	
4.2 Better disaster management and adaptation to water resources development and climate risks	4.2.1 Coordinated water infrastructure operations for multiple benefits including gender and vulnerability sensitive disaster mitigation and management	Outcome 1.1, 1.2, 1.3
	4.2.2 Climate change adaptation, flood and drought management mainstreamed at national levels	Outcome 2.1, 2.2
		Outcome 4.1
		Outcome 5.2

Cooperation Dimension Results Chain

Strategic Priority: Strengthen cooperation among all basin countries and stakeholders

The changing Mekong River Basin requires cooperation among all six basin countries to address issues of water security, fluctuating water levels from hydropower operations, and coordinating operations to mitigate floods, droughts, and sediment loss. Building on good foundations, including the work of the MRC, partnerships between all Mekong and regional water, energy and environment related cooperation mechanisms will need to focus on areas of complimentary strength and comparative advantage to minimize duplication and ensure a cost-effective response to achieving the Outcomes articulated in this strategy.

Strengthened cooperation among all basin countries and stakeholders will support more effective implementation of the *1995 Mekong Agreement* and a whole-of-basin approach. Most of the significant issues the basin is facing can be addressed only partially by the four MRC Member Countries. The basin cannot be managed effectively without the active cooperation of all six basin countries, especially China, and greater engagement with civil society and communities affected by water resources development and management.

Enhancing the capacity of basin countries, improving the operation of the MRC Procedures, negotiating and agreeing new joint investment projects and national projects of basin-wide significance, instituting year-round data sharing between all basin countries and bringing together expertise from all countries to address the most pressing issues are some of the important mechanisms to help ensure the regional costs from floods and droughts are minimised, and more optimal and sustainable development can be achieved. Enhanced, more coherent and systematic engagement of stakeholders on issues that affect them will also improve confidence in basin water resources management and contribute to better outcomes. All these requires active cooperation, facilitation and trust.

The Outcomes and Outputs focus on strengthening the MRC as the treaty-based intergovernmental river basin organization in the region for more effective implementation of the *1995 Mekong Agreement*, while working with all basin partners towards the integrated management of the entire river basin, including through building a common understanding of potential future institutional arrangements beyond 2030, agreeing significant joint investment projects, and putting in place mechanisms to work together on common problems and enhance stakeholder involvement.



Strategic Priority 5: Strengthen cooperation among all basin countries and stakeholders

Outcomes	Outputs	Contribution to other Outcomes
5.1 Strengthened MRC for more effective implementation of the Mekong Agreement	5.1.1 Implementation of the MRC Procedures enhanced	Outcome 1.1, 1.2, 1.3
	5.1.2 Organisational development of the MRC	Outcome 5.2
		Outcome 3.1
		Outcome 4.1
5.2 Increased joint efforts and partnerships for more integrated management of the entire river basin	5.2.1 Common understanding on the potential future institutional arrangements for entire basin management	Outcome 1.1, 1.2, 1.3
	5.2.2 Significant joint investment projects and national projects of basin-wide significance and associated measures agreed based on consideration of trade-offs, benefit sharing and risks	Outcome 2.1, 2.2
		Outcome 3.1, 3.2
	5.2.3 Mekong water-related cooperation mechanisms and relevant partnerships implemented in collaboration with countries	Outcome 4.1, 4.2
	5.2.4 Joint Basin Expert Groups	Outcome 5.1
	5.2.5 Harmonised basin-wide stakeholder platform	

5.10 Description of Outcomes and Outputs

Each Outcome and Output in the results chain above is described below together with the assessment indicators and impact pathways to facilitate the uptake of the resulting Outputs by line or implementing agencies and others. The key organisations that need to be involved in the delivery of each Output are also provided based on their mandate (national agencies), interests (private sector, development partners), or strategic and action plans (regional organizations, initiatives, and programmes).

The impact pathways describe enabling actions which will help ensure the Outputs can contribute effectively to the Outcomes. Enabling actions include: involving the responsible line agencies at the requisite levels of seniority in the design of the activities and the development of Outputs; allocating resources to support capacity building during the Output development process; awareness raising on issues and options for senior government officials; ‘translation’ of recommendations, guidance and options into national systems; and supporting the use of the regional products and services in national and regional decision-making. Building these impact pathways into the activity and task planning for each Output will help support the uptake of regional Outputs at the national level.

Environment Dimension Description of Outcomes and Outputs

Environment Dimension

Outcome 1.1 Adequate water flow and quality for a healthy environment and productive communities

Description of Outcome

By 2030, healthy riverine environment comprises flows that are within agreed ecological bounds, ensures rivers and wetlands are connected at frequencies and for durations to support ecosystem services including fish migration and enables riverbank agriculture and other livelihood activities to support people in vulnerable situations. Water quality in the Mekong remains good.

State of Basin and MRB-IF Indicators

- Compliance of dry season flows with the PMFM
- Compliance of flood season peak flows with the PMFM
- Compliance of Tonle Sap reverse flows with the PMFM
- Ecological health, and compliance of water quality with the PWQ

Output 1.1.1 Guidance for water flow and quality management implemented (related to Outputs 1.3.1, 2.2.1, 3.1.1, 4.1.1, 4.2.1, 5.1.1)

Output 1.1.2 Guidance and measures for impact mitigation of water infrastructure implemented (related to Outputs 1.2.1, 2.1.3, 3.1.2, 4.2.1)

Description of Output

Water resources development is causing changes in hydrology both over the long-term and through short-term fluctuations in water levels. Building on the limits for minimum dry season and maximum flood season flows under the MRC PMFM, thresholds for maximum dry season and minimum wet season flows, as well as acceptable rates of change for short-term fluctuations due to reservoir operations and extreme events, should be evaluated, recognising multiple objectives from infrastructure operations including for power generation. Where feasible, further thresholds that relate to the protection of the environment including for adequate reverse flow and the filling and discharge from the Tonle Sap Lake will be incorporated into operational decision-making, and routine monitoring, notification and reporting. Implementation of the MRC Procedures for Water Quality will be enhanced to encompass water quality related to incidents from the transport of hazardous goods and other emergencies, in cooperation with ASEAN as relevant. Enhanced monitoring, notification and reporting arrangements will be implemented where necessary.

Description of Output

Several guidelines and tools have been developed in recent years by the MRC, World Bank, IFC, ADB, ICOLD, other partners as well as the countries themselves to guide planning and decision-making on sustainable water infrastructure, including on designing and retrofitting sediment passage systems and sediment flushing operations, incorporating fish passage systems and addressing water quality, aquatic ecology and dam quality and safety issues. Systematically implementing this guidance in the planning, design, construction and operation of hydropower and other water infrastructure will include awareness-raising, incorporation of guidelines into national decision-making processes and regulatory frameworks, capacity building and knowledge sharing between national agencies and developers, and review and reporting on the consistency of projects and decision-making processes with the guidelines. Evaluating the effectiveness of the guidelines and updating them based on lessons learned and experience implementing mitigation measures in the Mekong River Basin may also be necessary.

Impact Pathway

1. Implementing agencies sign-off on concept and scope of potential new thresholds and methods
2. Implementing agencies, hydropower operators and navigation sector engaged in development of options
3. New thresholds incorporated into operational monitoring, notification and national decision-making processes
4. Monitoring, analysis and corrective actions undertaken by national agencies where necessary

Impact Pathway

1. Guidelines, and their updates, signed-off by implementing agencies
2. Raise awareness, build capacity and promote guidelines among implementing agency staff and developers
3. Plans developed and avenues identified to incorporate into national decision-making processes
4. Guidelines and measures implemented through national planning and decision-making processes

Key Organisations

MRC, MLC Water, national energy, environment and water agencies, private sector operators, ASEAN

Key Organisations

MRC, MLC Water, development partners, national energy, environment and water agencies, private sector developers and operators

Environment Dimension

Outcome 1.2 Sediment transport managed to mitigate bank erosion and maintain wetland and floodplain productivity

Description of Outcome

By 2030, as much as possible of the remaining suspended and bedload sediment transport is protected through improved siting, design and construction of any further instream barriers, more effective management of sediment extraction to ensure sustainability, and coordinated mitigation measures such as sediment flushing. Facilitating sediment transport trapped by dams and sediment extraction pits will help mitigate land subsidence in the delta, maintain floodplain productivity, reduce costs for riverbank protection along the length of the river, and help optimise the long-term economic potential of hydropower operations.

State of Basin and MRB-IF Indicators

- Changes in sediment transport
- Condition of riverine, estuarine and coastal habitats

Output 1.2.1 Basin-wide sediment management plan developed and implemented (related to Outputs 1.1.2, 3.1.1, 4.1.1, 4.2.1)

Description of Output

A plan to protect ongoing sediment transport throughout the basin developed, agreed and implemented by basin countries. This plan will include mechanisms to minimise further sediment loss in proactive regional and national planning and develop protocols for the coordination of sediment flushing operations in the mainstream and tributaries. Objectives will relate to minimising the future costs of riverbank protection and loss of floodplain productivity and optimising the economic potential of hydropower over the long-term. The plan will also identify measures to ensure the regional costs of sediment extraction operations are adequately factored into national and industry development plans. It will clearly identify roles and responsibilities, cost sharing mechanisms and adaptive planning based on systematic monitoring and evaluation of sediment transport and riverbank and coastal erosion, including through enhanced monitoring techniques with the use of remote sensing and earth observation technologies.

Impact Pathway

1. Implementing agencies sign-off on concept and scope of proposed basin-wide sediment management plan
2. Engagement and consultation with implementing agencies and hydropower and sediment extraction industries on issues and mechanisms to resolve them
3. Incorporation of sediment transport considerations in assessment methodologies for proactive regional planning
4. Incorporation of sediment management guidelines and protocols in dam design and operational decisions
5. Monitor, evaluate and adaptively manage

Key Organisations

MRC, MLC Water, national environment, industry and water agencies, private sector developers and operators

Environment Dimension

Outcome 1.3 Ecosystem services from wetlands and watersheds ensured

Description of Outcome

By 2030, regional and national development plans are informed by valuation of environmental assets and ecosystem services and agreed limits of acceptable change to ecological conditions, helping to ensure the continuation of the ecosystem services. Forested areas of watersheds are increasing. The key environmental assets of the basin provide a range of ecosystem services including provisioning (e.g. food, fuel, timber), regulating (e.g. flood control, water quality), supporting (e.g. habitat, carbon sequestration), and cultural (e.g. traditional and aesthetic values) services. These services contribute social and economic benefits to basin communities, particularly for poor, resource dependent people in vulnerable situations.

State of Basin and MRB-IF Indicators

- Extent of wetland area
- Condition of riverine, estuarine and coastal habitats
- Condition and status of ecologically significant areas
- Condition and status of fisheries and other aquatic resources

Output 1.3.1 Limits of acceptable change for key river and connected wetland habitats identified and implemented (related to Outputs 1.1.1, 3.1.1, 4.2.1)

Output 1.3.2 A basin-wide planning and management framework for watersheds developed and implemented (related to Output 3.1.1, 3.2.4)

Description of Output

Limits will be identified beyond which the ecological character of priority regional river or wetland assets will be changed and the functions and services they provide compromised. These limits will most usefully be expressed for hydrological parameters but could also relate to the extent of vegetation communities, water quality parameters, habitat fragmentation and so on. The limits will be based on expert scientific advice and gender and vulnerability responsive local community engagement, and then incorporated through an iterative approach into the assessment methodologies for proactive regional and national planning, so that trade-offs can be properly considered by national decision-makers. They will also inform the development and implementation of management plans for priority regional environmental assets and work to identify further monitoring and management thresholds for mainstream flows.

Description of Output

Sustainable watershed management is based on effective land-use planning and sound regulatory management and institutions. A regional planning and management framework for watersheds based initially on the network of upper catchment priority regional environmental assets and other key areas identified by Member Countries will facilitate implementation of improved land-use planning, institutional development and governance, effective policy, laws or regulations and enforcement mechanisms. This framework will support regulation of dry season flows, mitigating flash floods, biodiversity, and adaptation to climate change. It could also support the attraction of carbon offset projects including for reforestation, which can earn carbon credits to be sold on international markets. Guidance and capacity building for countries to improve watershed management would support implementation of the framework.

Impact Pathway <ol style="list-style-type: none"> 1. Implementing agencies sign-off on scope and concept 2. Implementing agencies and local communities engaged in identification and assessment 3. Awareness raising, support and facilitation for uptake and integration 4. Regional and national development plans modified to adequately protect priority regional environmental assets 	Impact Pathway <ol style="list-style-type: none"> 1. Implementing agencies sign-off on scope and concept 2. Implementing agencies engaged in development of regional framework 3. Awareness raising, support and facilitation for uptake and integration 4. Implementing agencies improve planning, regulatory and institutional arrangements 5. Implementing agencies and third parties take action to develop and implement projects
Key Organisations MRC, national planning/investment, environment and water agencies, GMS, ASEAN, local communities, research institutes	Key Organisations National environment, agriculture and forestry agencies, GMS, MRC, development partners

Social Dimension Description of Outcomes and Outputs

Social Dimension

Outcome 2.1 Strengthened water, food, and energy security for basin community well-being

Description of Outcome By 2030, households have sufficient access to food, water and energy to meet their basic needs and improve their climate resilience. Regional and national planning has been informed by strategies that can be implemented to improve equity and on the extent to which water resource development is affecting food security for all. People dependent on fish for their food security and livelihoods, have sufficient fish of value to catch, eat and sell, supporting their nutritional requirements and overall wellbeing. Effective management and development of the basin's water and related resources, including fisheries, should help conditions improve over time. Inequities, including in relation to gender, are addressed with targeted intervention focused on people in vulnerable situations.		State of Basin and MRB-IF Indicators <ul style="list-style-type: none"> - Food Security - Water Security - Access to electricity 	
Output 2.1.1 Access and supply of safe water to people in vulnerable situations improved (related to Output 2.1.4)	Output 2.1.2 Capture fisheries regulatory frameworks improved to support food security (related to Outputs 1.3.1, 1.3.2, 3.2.5)	Output 2.1.3 Risks to capture fisheries productivity and diversity minimised to support food security (related to Outputs 1.1.2, 1.3.1)	Output 2.1.4 Gender and vulnerability aspects of basin water, food, and energy security addressed (related to Outputs 2.1.1, 3.1.1)

Description of Output	Description of Output	Description of Output	Description of Output
Access to safe water supply lags access to improved water sources by some distance, especially in many rural areas of the basin. Improving the capacity of national and local authorities to address these issues in the most challenging areas is an important step to achieving SDG 6. Country-to-country knowledge sharing and best-practice international expertise will be brought to bear in developing an investment plan for targeted intervention, including pilot projects to improve safe water supplies and sanitation for people in vulnerable situations.	Fish in the basin are under pressure, including from unsustainable fishing, and management of fisheries needs to improve. Guidelines available to basin countries on identifying important habitats and designing measures to protect them from both in-situ and ex-situ threats, on designing and implementing appropriate regulatory mechanisms (incl. legal requirements and compliance) and institutional arrangements (incl. co-management), will help ensure fishing is sustainable and in the best possible position to withstand future shocks including changes from water resources development. Mechanisms to share lessons learned between countries on success and failure will be implemented to help build regional capacity.	The construction and operation of dams will have an impact on capture fisheries productivity, especially for migratory species. Other basin developments including in agriculture and mining also threaten fish. Measures will be evaluated and further identified to mitigate the risks to fish including through the use of environmental flows, operational guidance for structures that affect the immediate hydraulic and water quality environment around dams and in impoundments, and by studying the effectiveness of fish passages in relation to the unique fish ecology of the basin. Guidance for dam operators and national agencies overseeing the coordination of dam operations will support measures to mitigate the risks to fish.	Improving the understanding by decision-makers of Mekong specific needs, rights, challenges and opportunities in water, food and energy security of both women and men in vulnerable situations will help identify measures to improve equity for vulnerable groups in different parts of the basin. National data collection and processing mechanisms will be modified to enable the assembly and analysis of sub-national, national and regional datasets on gender and other dimensions of vulnerability. Improved datasets will be used to identify and evaluate policies, programs and measures to improve equity for vulnerable groups in conjunction with water resources development.
Impact Pathway	Impact Pathway	Impact Pathway	Impact Pathway
<ol style="list-style-type: none"> 1. Build capacity of national and local authorities 2. Develop investment plan and mobilise resources 3. National agencies and private sector implement plan with support of development partners 	<ol style="list-style-type: none"> 1. Implementing agencies sign-off on scope and concept 2. Ownership and buy-in built by involving national and local bodies 3. National and local policies, regulations and governance changed 4. New arrangements implemented by fisheries organisations and local fishers 	<ol style="list-style-type: none"> 1. Implementing agencies sign-off on scope and concept 2. Knowledge improved through monitoring, studies and documenting best practice including on costs and benefits 3. Guidelines tested and incorporated into operational decision-making and future designs 	<ol style="list-style-type: none"> 1. Implementing agencies sign-off on scope and concept 2. Spatially distributed and gender disaggregated data collected, analysed and reported 3. Information incorporated into scenario assessments
Key Organisations	Key Organisations	Key Organisations	Key Organisations
MLC Water, national agencies, development partners, ASEAN, UN, CSOs	MRC, SEAFDEC, ASEAN, national agencies, development partners, CSOs	MRC, national agencies. Development Partners, research institutes	MRC, MLC Water, national agencies, development partners, ASEAN, UN, CSOs

Social Dimension

Outcome 2.2 Increased employment and reduced poverty among vulnerable people dependent on river and wetland resources

Description of Outcome

By 2030, less people will be directly dependent on natural resources for their income and sustenance, with greater involvement in the growing industry and service sectors of the economy. Higher participation in employment with decent wages and diversified livelihoods for both men and women has helped reduce vulnerability and improved economic prosperity. Knowledge gaps on the needs, risks, and opportunities and the strategies that can be put in place to support people in vulnerable situations have been closed: we know where they live, how they are impacted by water-related development and operations, what kind of national or local strategies and support programmes can improve their resilience, and how these programmes can be delivered.

State of Basin and MRB-IF Indicators

- Employment in LMB water-related sectors
- Economic security
- Gender equality in employment and economic engagement

Output 2.2.1 Alternative and sustainable livelihood strategies for poor, resource dependent communities impacted by water resources development and management prepared and implemented at national levels (related to Outputs 2.1.4, 3.1.1, 5.2.2)

Description of Output

The assembly and analysis of sub-national, national and regional datasets on gender and other dimensions of vulnerability will be used to identify the needs, risks and opportunities for poor, resource dependent communities impacted by water resource development. Strategies to facilitate the transition of poor, resource dependent people to alternative and sustainable livelihoods that enable higher incomes and better living standards for both women and men and other vulnerable groups will be identified, consulted and implemented through national development plans. Strategies will be informed by improved spatially distributed and gender disaggregated data on people and communities in vulnerable situations, and implemented in conjunction with both joint investment projects and national projects of basin-wide significance.

Impact Pathway

1. Implementing agencies sign-off on scope and concept
2. Data collection and processing mechanisms modified
3. Spatially distributed and gender disaggregated data collected, analysed and reported
4. Alternative livelihood strategies identified, evaluated and mainstreamed into national plans including for joint investment projects and national projects of basin-wide significance
5. Resources mobilised and plans implemented

Key Organisations

National agencies, development partners, ASEAN, UN, CSOs

Economic Dimension Description of Outcomes and Outputs

Economic Dimension

Outcome 3.1 Increased economic growth of all basin countries from more proactive regional planning

Description of Outcome

By 2030, adapted regional and national development plans for water resources of the Mekong would have higher overall benefits and lower overall costs than earlier versions. Changes to national plans will be considered through sovereign processes, taking into account the basin-wide alternative development scenarios prepared and assessed through a more proactive regional planning approach. Economic growth and the contribution of the basin's strategic resources (food, water, energy) to national and regional demands should be higher in individual countries and for the region as a whole, as projects take into account synergies and trade-offs between basin-wide sectoral development to increase benefits, reduce costs (including for mitigating adverse impacts), and provide long-term water security against major floods and droughts. Projects include those for instream and floodplain storage to reduce flood peaks, with natural floodplain storage also protected and considered along with other nature-based solutions to provide benefits to biodiversity and fisheries. Benefits and costs are more evenly distributed in the basin ('making the pie bigger in order for the countries to share the pie fairly').

State of Basin and MRB-IF Indicators

- Contribution of LMB water-related sectors to basin, national and regional GDP
- Contribution of LMB water-related sectors to food and energy supply

Output 3.1.1 The Basin Development Plan and associated national plans are informed by the findings of a more proactive regional planning approach (related to Outputs 1.1.1, 1.2.1, 1.3.1, 1.3.2, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2.1, 4.2.2, 5.2.2)

Description of Output

Updates to the Basin Development Plan as stated in the *1995 Mekong Agreement* and national plans of individual countries will be considered through normal periodic reviews that include options for increasing benefits, reducing costs and providing long-term water security. An assessment of alternative basin-wide development scenarios includes an identification of options to increase in-stream and floodplain storage within the whole basin for flood, drought and environmental management purposes. The recommendations for updating the BDP and national plans (including mainstreaming climate change adaptation in sector development plans) may include adding joint investment projects and projects of basin-wide significance, changes to the location or design of existing projects, or not proceeding with others. Alternative dam operating rules will also be considered to help coordinate flood and drought mitigation, provide for environmental flows, and manage sediment transport while maximising power generation. The new information will inform discussion, to be done under Strategic Priority 5 on cooperation, of trade-offs and benefit sharing opportunities (through significant joint investment projects and projects of basin-wide significance) and acceptable transboundary impacts between the countries to determine the best ways by which to develop the basin given the current circumstances and the legitimate aims and concerns of each country.

Impact Pathway

1. Implementing agencies sign-off on scope and concept
2. Implementing agencies steer and oversee scenario assessments and related studies
3. Implementing agencies engage in regional discussions on trade-offs and benefit sharing
4. Implementing agencies include projects in national planning processes
5. Plans implemented leading to higher benefits and lower costs

Key Organisations

MRC, MLC Water, national agencies, development partners, CSOs, research institutes

Economic Dimension

Outcome 3.2 Enhanced inclusive growth and sustainability in irrigated agriculture, hydropower, navigation, environment and fisheries sectors

Description of Outcome

The inclusive economic growth and sustainability of key water-related sectors including irrigated agriculture, hydropower, navigation, ecosystem services, and fisheries will be substantially higher in 2030 than it is today. This value will be realised with regard to inter-sectoral linkages and the opportunity to achieve multiple benefits, including the mitigation of floods and droughts, with the long-term sustainability of industries as a key driver, based on more proactive regional planning under Outcome 3.1 and the implementation of priority investments and associated measures consistent with or outlined in basin-wide / regional sector strategies. Each sector will add value to the economy rather than detracting from it and draining resources including labour and capital from other more valuable sectors.

State of Basin and MRB-IF Indicators

- Economic value of LMB water-related sectors:
 - agriculture
 - hydropower
 - navigation
 - sand mining
 - wetlands
 - capture fisheries
 - aquaculture
 - forestry
 - tourism and recreation

Output 3.2.1

Irrigated agriculture investments and associated measures implemented (related to Outputs 3.1.1, 5.2.2)

Output 3.2.2 Sustainable hydropower development strategy and related regional energy plans implemented in synergy (related to Outputs 1.2.1, 1.4.2, 3.1.1, 5.2.2)

Output 3.2.3

Basin navigation plans implemented in synergy (related to Output 3.1.1)

Output 3.2.4 Regional environmental strategies and programmes implemented in synergy (related to Outputs 1.3.1, 1.3.2, 3.1.1, 5.2.2)

Output 3.2.5

Investment and associated measures to adapt to changes in fish populations and catch composition identified and implemented (related to Outputs 2.1.2, 2.1.3, 5.2.2)

Description of Output	Description of Output	Description of Output	Description of Output	Description of Output
Investment opportunities and associated measures will be identified and implemented in: (i) the rehabilitation and increased efficiency of existing irrigated agricultural areas; (ii) new irrigation on existing agricultural land; and (iii) development of new agricultural land. Measures will be needed to address sustainable groundwater use, water quality issues and enable higher value and clean produce.	The sustainable hydropower strategy of the MRC will be implemented in synergy with related regional energy plans and options assessment (ASEAN, GMS, etc) and based on input from proactive regional planning, including the assessment of alternative basin-wide development scenarios. Implementation will include identifying how to adapt national plans so that regional benefits are higher and regional costs lower and to enable planning, design and operations to have regard to multiple benefits and potential benefit and cost sharing mechanisms.	A comprehensive programme of work has been identified in navigation master plans of the JCCCN and MRC ²⁵ for the upper and lower Mekong River Basins. This includes infrastructure investments and supporting measures. Work will be prioritised and implemented according to an agreed schedule. The priorities and schedule will consider progress with complementary hydropower development plans and projected growth in navigation demand in both upper and lower parts of the basin considering both cargo and tourism needs.	A comprehensive programme of work has been identified in basin environmental management strategies (MRC, MLC, GMS, ASEAN), ranging from use of economic instruments, developing legal frameworks, assessing ecosystem services (including identifying appropriate indicators) and engaging local communities. Work will be prioritised and implemented according to an agreed schedule, with a focus on mainstreaming protection of priority regional assets into national sector plans and identifying new financing mechanisms and sources of funding.	As fish populations may change over time due to development impacts, consideration will be given to optimising the benefits of the changes for local communities with consideration of existing inequities. Investments and associated measures will be identified to support regulatory improvements (e.g. changes in allowable fishing areas, use of different types of gear), implement enhancement methods (incl. use of reservoirs) such as stocking and sustainable aquaculture, and facilitating market development for different species.
Impact Pathway for all Outputs				
1. Implementing agencies prioritise investments and associated measures 2. Implementing agencies agree on work schedule 3. Implementing agencies prepare the prioritised investments and associated measures for implementation 4. Water cooperation platforms facilitate and support				
Key Organisations	Key Organisations	Key Organisations	Key Organisations	Key Organisations
MLC Water, national agencies, ADB, FAO, private sector, development partners	MRC, MLC Water, national agencies, GMS, ASEAN, private sector, development partners	MRC, JCCCN, MLC Water, GMS, national agencies, development partners	MRC, MLC Environment, national agencies, GMS, ASEAN, development partners	MRC, national agencies, FAO, ASEAN

²⁵ JCCCN's Development plan on International Navigation on the Lancang-Mekong River (2015-2025) and MRC's Master Plan for Regional Waterborne Transport in the Mekong River Basin

Climate Change Dimension Description of Outcomes and Outputs

Climate Change Dimension				
Outcome 4.1 Better informed and prepared basin communities against changing river conditions, and more frequent and severe floods and droughts				
Description of Outcome		State of Basin and MRB-IF Indicators		
By 2030, in the face of changing river conditions, more extreme floods and droughts, communities will be better informed and prepared with comprehensive basin monitoring, timely assessment, more accurate forecasting and early warning and communication systems. This occurs through an integrated whole-of-basin monitoring network, feeding this and other data into integrated data and information systems, allowing for the assessment, analysis and forecasting by enhanced models and tools, as well as information sharing and timely notification to key stakeholders. Knowledge is shared and capacity built for disaster response.		- Vulnerability to floods, droughts and storms		
Output 4.1.1	Output 4.1.2	Output 4.1.3	Output 4.1.4	Output 4.1.5
A core river monitoring network for the mainstream and remaining national river monitoring networks consolidated (related to Outputs 1.1.1, 1.2.1, 4.1.2, 4.2.1, 5.2.1)	Integrated data and information systems for more effective basin-wide data management and sharing (related to Outputs 4.1.1, 4.1.4, 4.1.3, 4.2.2, 5.1.1, 5.1.2)	Compatible Decision Support Systems building on reinvigorated data, modelling, forecasting, and communication capabilities (related to Outputs 3.1.1)	Integrated basin-wide flood and drought forecasting and early warning (related to Outputs 4.1.1, 4.1.2, 4.1.3, 5.2.2, 5.2.3)	Joint State of Basin Report (related to Outputs 3.1.1, 4.1.1, 4.1.2, 5.2.2)



Description of Output	Description of Output	Description of Output	Description of Output	Description of Output
Comprehensive data and information are available for the development and management of basin water resources through a core monitoring network for the mainstream, managed and operated by the MRC, and complemented by consolidated, more cost-effective national networks for national and regional purposes. Consolidation is supported by a rigorous network analysis that identifies the most cost effective whole-of-basin monitoring network to meet current and future needs supporting both planning and operational decisions.	Integrated data and information databases are a core element of the enhanced decision support systems, for the MRC and basin countries.	Reinvigorated and compatible decision support systems (DSS) available at regional and national levels for the whole Mekong River Basin. Systems will be linked together to share data and information (Outputs 4.1.1 and 4.1.2), support joint studies and assessments, and enable consistent evaluation of alternative scenarios and plans throughout the basin. Systems provide support to both integrated planning and coordination of operations, including online monitoring, flood and drought forecasting (Output 4.1.4), improved data analysis, strategic planning, implementation of procedures and communication of results.	A regional forecasting and early warning system for flood and drought based on an integrated monitoring network, improved data acquisition and forecasting tools and processes, and agreed communication protocols between regional cooperation platforms and national agencies. Additional data collection and transmission may be necessary, including through greater use of remote sensing technology. Notification of critical information and warnings will be communicated to affected people through multiple channels including new media and mobile technology.	All six basin countries contribute data and information to the preparation and drafting of the next State of Basin report in 2023. By 2028, the report is a joint product of the MRC and MLC Water, reflecting the conditions and trends across the five dimensions and in accordance with the MRB-IF throughout the basin. This builds on further joint studies and research between the two platforms on priority and informs the development of a joint BDS in the future.
Impact Pathway	Impact Pathway	Impact Pathway	Impact Pathway	Impact Pathway
<ol style="list-style-type: none"> 1. Regional audit of existing stations and current and future needs 2. Implementing agencies oversee monitoring network analysis and redesign 3. Redesigned core and national monitoring networks integrated into regional and national budgets and work plans 	<ol style="list-style-type: none"> 1. Regional inventory of existing data and information and future needs 2. Implementing agencies sign-off on scope and concept 3. Implementing agencies oversee the design and development of integrated data and information systems 	<ol style="list-style-type: none"> 1. Implementing agencies sign-off on scope and concept 2. Implementing agencies oversee the design and development of the DSS's at regional and national levels 3. Countries agree communication and data analysis and sharing protocols 	<ol style="list-style-type: none"> 1. Implementing agencies and MLC Water sign-off on scope and concept 2. Engagement with affected communities on needs and challenges 3. Data collection and sharing between countries 4. Systems in place at regional and national levels 	<ol style="list-style-type: none"> 1. Concept prepared and agreed between MRC and MLC Water 2. Sharing of data and information and joint preparation of SOBR 3. Both parties jointly update the BDS in 2029 based on agreed concept

Key Organisations	Key Organisations	Key Organisations	Key Organisations	Key Organisations
MRC, MLC Water, national agencies, development partners	MRC, MLC Water, national agencies, development partners	MRC, MLC Water, national agencies, development partners	MRC, MLC Water, national agencies	ASEAN, MRC, MLC Water, National agencies

Climate Change Dimension

Outcome 4.2 Better disaster management and adaptation to water resources development and climate risks

Description of Outcome

By 2030, in response to more disasters, floods and droughts as well as salinity intrusion due to climate change and unexpected impacts of water infrastructure, national development plans are being implemented which include (joint) projects that can increase dry season flows to support agriculture during drought and to mitigate salinity intrusion during low flows and in response to sea level rise (identified by proactive regional planning under Output 3.1.1 and negotiated under Output 5.2.2). Transboundary cooperation projects on climate change adaptation facilitate the identification of these significant joint and national projects by building trust and enhancing joint planning and problem solving. The use of infrastructure for flood and drought mitigation is coordinated, including through transboundary cooperation. Floodwater management is coordinated to enable storage and conveyance of floodwaters in an efficient and cost-effective way. Measures to adapt to flood and drought are mainstreamed in national sector strategies, plans and projects.

Output 4.2.1 Coordinated water infrastructure operations for multiple benefits including gender and vulnerability sensitive disaster mitigation and management (related to Outputs 1.2.1, 1.2.2, 3.1.1, 4.1.1, 4.2.1, 5.2.2, 5.2.3)

State of Basin and MRB-IF Indicators

- Flood protection measures
- Drought protection measures
- Vulnerability to floods, droughts and storms
- Institutional response to the effects of climate change

Output 4.2.2 Climate change adaptation, flood and drought management mainstreamed at national levels (related to Outputs 3.1.1, 5.2.2)

Description of Output

The operation of storage reservoirs and hydropower cascades to help mitigate floods, droughts and other emergencies and to provide environmental and social benefits will be coordinated through agreed operating and communication protocols to manage transboundary risks, ensure predictable responses to extreme events, and facilitate clear communication between parties including advance notification. Multiple benefits will be sought, including through the delivery of environmental flows for fish and wetlands, and coordinated sediment flushing operations. Where relevant, the operation of flood protection infrastructure such as gates/sluiques, floodways and pumping stations will also be coordinated through agreed protocols to minimise the potential damage to each country.

Description of Output

Strengthening flood and drought management capacity at the national level, including through implementation of integrated regional strategies for flood, drought and climate change adaptation with planned and newly identified investments in all relevant water-related sectors (such as storage-backed hydropower, socio-economic floodplain development, and wetland and watershed protection) will enhance resilience. Associated measures may include addressing knowledge gaps in the conjunctive, sustainable use of groundwater; and capacity building for national agencies on assessing climate change risks and impacts. Transboundary climate change adaptation projects to mitigate floods and/or droughts will be identified and implemented, building trust through integrated water resources management, and helping inform the identification of the significant joint and national projects through proactive regional planning. Coordination of floodwater management based on the scenario assessment work under Output 3.1.1 will inform more integrated regional flood and drought management.

Impact Pathway

1. Engagement of implementing agencies, developers and operators in opportunities, risks and challenges
2. Identification of solutions and protocols developed
3. Protocols incorporated into water infrastructure operations

Impact Pathway

1. Comprehensive scenario planning involving options to manage floods and drought
2. Facilitated discussion of joint investment projects and benefit sharing between countries
3. Transboundary projects build trust and mechanisms to enhance cooperation
4. Measures for climate change adaptation identified and mainstreamed at national levels

Key Organisations

MRC, MLC Water, national agencies, hydropower, reservoir and other infrastructure operators, CSOs

Key Organisations

MRC, national agencies, development partners, UN

Cooperation Dimension Description of Outcomes and Outputs

Cooperation Dimension

Outcome 5.1 Strengthened Mekong River Commission for more effective implementation of the Mekong Agreement

Description of Outcome

By 2030, a strengthened MRC (as the sole treaty-based intergovernmental river basin organization in the Mekong reaffirmed by hitherto three MRC Summits of Prime Ministers), in terms of structure, organisational capacity, and procedural mechanisms, produces more relevant, value-added and important Outputs for regional and national water resources development and management. In its cooperation arrangements and operations, the MRC focuses on its strengths and comparative advantage as well as sharpen its core functions to avoid duplication and complements other broader cooperation mechanisms towards common basin and regional objectives. Implementation has further shifted to national line and implementing agencies including through the operation of joint basin expert groups and is supported and facilitated by smaller but stronger regional and national secretariats.

State of Basin and MRB-IF Indicators

- Proportion of MRC budget funded by national contributions
- Extent of knowledge sharing activities

Output 5.1.1 Implementation of the MRC Procedures enhanced (related to Outputs 1.1.1, 1.2.1, 3.1.1, 4.1.2)

Description of Output

Implementation of the *1995 Mekong Agreement Procedures* is enhanced including by earlier engagement in planning and design under PNPCA, a review and update of PDIES to support improved data sharing and management arrangements. Lessons learned from implementation to-date and previous reviews, as well as any updates related to other MRC Procedures (PMFM, PWQ and PWUM) undertaken in Output 1.1.1), inform the development of an action plan and agreed procedural arrangements with updated technical guidelines, where appropriate.

Output 5.1.2 Organisational development of the Mekong River Commission (related to Outputs 5.1.1, 5.2.2, 5.3.3)

Description of Output

A financially secure, world-class and riparian-owned river basin organisation is a MRC, including its Regional Flood and Drought Management Center, that meets the needs of the countries as a basin monitor, knowledge hub, facilitator of joint efforts and platform for water diplomacy. Organisational development provides a basis for effective cooperation that creates and delivers value for the countries. Contributions from Member Countries to the MRC rise in-line with commitments to 2030, and MRC work is supported by strong engagement from national line/implementing agencies by integration into national work plans and budgets.

Impact Pathway

1. Concept signed-off by implementing agencies
2. Improved procedures/guidelines discussed and negotiated by implementing agencies
3. Enhanced procedures/guidelines agreed by Member Countries

Key Organisations

MRC, national agencies

Impact Pathway

1. Member Countries and MRC jointly prepare an organisational development plan covering all parts of the MRC including regional and national bodies
2. Member Countries and MRC jointly lead the implementation of the organisational development plan

Key Organisations

MRC, national agencies, development partners

Cooperation Dimension

Outcome 5.2 Increased joint efforts and partnerships for more integrated management of the entire river basin

Description of Outcome

By 2030, the regional platform for cooperation on Mekong water resources management among basin countries, long established by the MRC in the Lower Mekong and recently enhanced by the MLC Water cooperation for the whole basin, will be refined, strengthened and transformed, with clear principles of cooperation. The basin countries and all water cooperation mechanisms will have been working collaboratively together for the integrated management of the entire Mekong River Basin – Upper and Lower Mekong, including through new joint investment projects. As resources are limited, cooperation occurs where it is focused on the Strategic Priorities and necessary to achieve the Outcomes of this Strategy. Different mechanisms have different strengths and areas of comparative advantage, including complementary strengths outside the water sectors. Identifying these relative strengths and designing processes to leverage them efficiently and effectively and engage with all relevant stakeholders in a harmonised way provides a basis to optimise the benefit/cost ratio of managing the entire river system.

State of Basin and MRB-IF Indicators

- Joint efforts on projects of basin-wide significance and with potential transboundary impacts
- Extent of knowledge sharing activities
- Partnerships between the MRC and other parties
- Overall environment, social and economic benefits derived in each country's part of the basin
- Proportion of benefits derived from cooperation relative to total net economic value (Cost of cooperation relative to value created and delivered)

Output 5.2.1

Common understanding on the potential future institutional arrangements for entire basin management (related to Output 5.2.4)

Output 5.2.2

Significant joint investment projects and national projects of basin-wide significance and associated measures agreed based on consideration of trade-offs, benefit sharing and risks (related to Outputs 2.2.1, 3.1.1, 4.2.1, 4.2.2)

Output 5.2.3

Mekong water-related cooperation mechanisms and relevant partnerships implemented in collaboration with countries (related to all Outputs)

Output 5.2.4

Joint Basin Expert Groups (related to Outputs 5.1.2, 5.2.1)

Output 5.2.5

Harmonised basin-wide stakeholder platform (related to all Outputs)

Description of Output	Description of Output	Description of Output	Description of Output	Description of Output
<p>To provide direction to further cooperation between the two key regional water platforms, basin countries need to achieve a common understanding on the potential future institutional arrangements for managing the entire Mekong-Lancang river system with a view to optimising the value created, delivered and captured relative to the costs of cooperation. To achieve this, the various options need to be explored, articulated and discussed so that all parties have a clear understanding of the nature of future cooperation arrangements and can strengthen the relevant organisations to support the implementation of those arrangements.</p>	<p>The significant joint investment projects and national projects of basin-wide significance (the main mechanisms for regional benefit sharing) identified in Output 3.1.1 will be further conceptualized for subsequent incorporation in the national planning and decision-making systems. The joint preparation of the concept document (with the detail of a WB Project Concept Note for investment financing) will underpin a deal structure (or agreement) between the participating countries and the subsequent incorporation of the project in the national plan(s). The feasibility and associated ESIA studies for the further preparation of the joint investment projects will be implemented by the involved countries with regional facilitation and technical support as needed and requested.</p>	<p>Each regional cooperation mechanism identifies its areas of relative strength and comparative advantage and identifies complementary strengths in others. Priorities for engagement and cooperation are identified and input is provided into the strategies and plans of other cooperation mechanisms and options for a Mekong Fund to support social and environmental measures, including in relation to disasters, is explored.</p>	<p>National and regional expertise in water resources management and development is pooled in expert groups consisting of members from all six basin countries. These groups operate to ensure consistent information, analysis and advice, including where there are differences of view, through the governance structures of both MRC and MLC Water. These groups enable learning about basin-wide opportunities and risks and bring national perspectives into regional work.</p>	<p>A basin-wide stakeholder platform will be operational to promote common understanding of the evidence base relating to the basin; to promote greater understanding of the role and benefits of procedures and products; and to provide a forum for substantive involvement of broader stakeholders in regional water resources planning and operational management. This harmonised platform consolidates the current fragmentation and duplication in stakeholder engagement and helps combat stakeholder fatigue. Meaningful stakeholder and public participation engagement can be enhanced through better information disclosure and target capacity development.</p>

Impact Pathway	Impact Pathway	Impact Pathway	Impact Pathway	Impact Pathway
<ol style="list-style-type: none"> 1. Basin countries engaged in the preparation of a joint concept note 2. Basin countries have an opportunity to engage in discussions and negotiations on the options for future institutional arrangements 3. Basin countries sign-off on selected option for implementation 	<ol style="list-style-type: none"> 1. Implementing agencies steer and oversee project identification 2. Implementing agencies prepare projects 3. Implementing agencies discuss and negotiate joint investment projects 4. Implementing agencies include projects in national planning processes 	<ol style="list-style-type: none"> 1. Cooperation mechanisms engage in the prioritisation of strengths and comparative advantage 2. Cooperation mechanisms focus their strategic and work plans on their comparative advantages 3. Cooperation mechanisms provide input to the strategies and work plans of other mechanisms where appropriate 	<ol style="list-style-type: none"> 1. Membership of Expert Groups includes permanent, senior technical officials of all key water-related ministries of all six basin countries 2. Expert Groups have agreed ToR to steer, supervise and increasingly implement the regional work 3. Members have assigned responsibilities in their home ministries that include contributing to the work of the Expert Group 	<ol style="list-style-type: none"> 1. All relevant stakeholders agree with the proposed concept 2. All stakeholder groups are represented in the platform activities to ensure balance and diversity of views 3. Consistent recording, reporting, and impact tracking procedures
Key Organisations	Key Organisations	Key Organisations	Key Organisations	Key Organisations
National Governments, MRC, MLC Water, ASEAN, and others	MRC, MLC Water, national agencies, development partners, ASEAN	MRC, MLC Water, MUSP, GMS, ACMECS, Mekong-Japan, Mekong-ROK	MRC, MLC Water, ASEAN, National agencies	CSOs, MRC, MLC Water, MUSP, private sector actors, development partners



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IMPLEMENTATION OF THE STRATEGY

This chapter shows that higher levels of regional cooperation between the basin countries and their regional cooperation mechanisms are needed to produce the Outputs and achieve the Outcomes that are defined in this BDS. The MRC will coordinate BDS implementation and needs the extensive involvement of all relevant actors in the basin.

6.1 Implementing sustainable development opportunities

Identified and agreed development opportunities will be implemented at national and sub-national levels through national and local agencies and organisations, and also through the private sector, based on national regulatory frameworks and guidelines, as well as applicable regional procedures and guidelines, which involves meaningful public participation and consultations with civil society and affected communities. Joint investment projects between two or more countries will be implemented through coordinated national development or regional cost and benefit sharing agreements.

The basin countries' water cooperation platforms (MRC and MLC Water), as well as ASEAN, GMS and other relevant actors, will continue to promote and help coordinate sustainable development opportunities, in particular joint investment projects and national projects of basin-wide significance. In this context, the MRCS will in time perform its core river basin advisory service function for technical queries and requests for support from national agencies, developers and others related to implementation of the BDS and the use of best practice guidelines.

The implementation of this strategy will identify significant joint investment projects and national projects of basin-wide significance through the assessment of a few alternative basin-wide development scenarios, building on the earlier assessments of national water resources development plans and available regional options assessments for the energy and other water-related sectors. The new scenario assessments will be used to build further trust and confidence among the basin countries by exploring whether modifications and additions to national plans (by adding joint and national significant projects) will lead to better social, economic, environmental and water security outcomes.

If the results demonstrate significant added national benefits arising from working collaboratively, each country subject to its own sovereign decisions will have the rationale to adapt its national plans for greater mutual benefit as part of the regular review and updating of those plans. New joint and national significant project opportunities will be named in the "Sustainable development opportunities" section of the next BDS. If

requested, the water cooperation platforms will assist the countries in the adaptation of national plans and the preparation of the newly agreed joint investment projects.

6.2 Implementing strategic priorities

The BDS Outcomes in the five strategic priority areas will be addressed by the countries' regional organizations, initiatives and programmes (see Section 2.5) in collaboration with relevant counterpart organizations, such as national line and implementing agencies, scientific and advisory institutes, civil society organisations and others. The MRC will coordinate BDS implementation and deliver many of the BDS Outputs through its activities in the MRC Strategic Plan. The other regional cooperation mechanisms will contribute to BDS Outcomes through activities, projects and programmes in their water-related priority areas.

MRC Strategic Plan. Given its mandate, MRC is responsible for the overall coordination of implementation of the BDS 2021–2030, with support of the MRCS at the regional level and the NMC Secretariats at the national level. To undertake these responsibilities, the MRC has prepared a five-year Strategic Plan (2021–2025) which supplements this BDS to contain:

- Objectives for the MRC in terms of (i) promoting and coordinating basin development and management and (ii) strengthening its institutional structure and operations;
- A five-year activity plan for implementation of the BDS results chain with deliverables and timelines, implementation arrangements, collaborative partnerships, budget lines, and allocation of responsibilities to operational and governance units;
- The integrated planning, M&E and reporting framework for the entire BDS.
- Institutional and operational development perspectives of the MRC.

National Indicative Plans (NIPs). The basin countries are encouraged to prepare a NIP in 2020/2021 to implement the BDS at the national level, capturing the benefits from regional cooperation. The NIP is the primary channel by which basin perspectives, basin management functions, development opportunities, and regional guidance and tools are promoted and mainstreamed into the five-year national socio-economic and sector planning and annual work planning of relevant national agencies.

Since the NIP has to align with national planning and budgetary cycles, a rolling NIP will be prepared, with different timeframes for different NIP components, and with a flexible formulation process. NIP preparation will involve meaningful public participation and consultations with civil society and affected communities, as well as with relevant development partners for support. The NIPs will include:

- **Current significant planned infrastructure projects of basin-wide significance** in water, energy and related sectors, which provide an opportunity for early engagement of the countries' water cooperation platforms (MRC, MLC Water) in the preparation of such projects with a view to enhancing project benefits and sustainable development outcomes, which will facilitate project consultation and approval processes;
- **New or updated joint investment projects** and national projects of basin-wide significance, which are the primary means for increasing and sharing the benefits from developing the Mekong's water resources. These projects are significant infrastructure investments and associated measures in water resources development and management, primarily those that will be identified in the proactive regional planning. The regional water cooperation platforms will support the preparation of such projects, as described in Section 6.1;
- **Transboundary pilot projects and joint non-infrastructure projects** to share experience, improve knowledge, management, systems and cooperation;
- **Activities for facilitating uptake** at the national level of basin and regional sector strategies, technical guidelines, major study/report recommendations, basin monitoring (national/decentralized) and capacity building and knowledge sharing in the national planning and decision-systems, with a view to increasing the benefits of national plans and projects and reducing the regional costs. For the implementation of the MRC Strategic Plan, the national contributions are indicated in the results chain with Outputs, deliverables and activities (Section 8.2 to 8.6).
- A summary of national activities associated with the water-related activities of the regional cooperation mechanisms (such as MLC, ASEAN, GMS and the like), and national activities that contribute to BDS Outputs supported by development partners and international financing institutions;
- **An implementation plan** and further funding mobilisation strategy, which identifies funding sources and the necessary steps to access those sources.

Alignment between regional water cooperation platforms. Higher levels of regional cooperation between all six basin countries are required to produce the Outputs and achieve the Outcomes that are defined in this BDS. Therefore, this Strategy promotes a process of increasing cooperation between the two water cooperation platforms of the basin countries: the MRC and MLC Water, initially based on the MoU between the MRCs and the LMC Water Center. Many activities in the List of Proposed Projects on Lancang-Mekong Water Resources Cooperation²⁶ will contribute to the Outcomes and Outputs

26 Which builds on the Five-Year Plan of Action on Lancang-Mekong Cooperation 2018-2022

defined in this BDS. Cooperation between these two platforms facilitates implementing a whole-of-basin approach for water-related monitoring, data/information exchange, proactive regional planning, flood and drought forecasting, and operational management of the water infrastructure.

The two water cooperation platforms should begin exploring **the establishment of joint basin expert groups** and aiming at establishment of one integrated river management system for flood and drought management, water utilization and environmental conservation. The expert groups will promote basin-wide coherence in approaches and technology, ensure results and services respond to national and regional needs, and assist in the uptake and use of the results in the national planning and management systems. To enhance capacity and knowledge in technical discussions, non-governmental experts and academics will be invited to expert group meetings, as appropriate.

Plans of other regional cooperation mechanisms. The water-related activities of other relevant regional organizations, initiatives and programmes generally have a broader scope than this BDS²⁷ (which predominantly focuses on transboundary Mekong water resources management), but their implementation could contribute to BDS Outcomes and some of the Outputs that have a broader scope (Table 6.1). Some of these regional cooperation mechanisms will be targeted at the achievement of BDS Outputs through cooperation arrangements with the MRC and MLC Water, ASEAN and GMS. The Outputs (and key deliverables) of the water-related activities of regional cooperation mechanisms will be tracked through MRC's organisational M&E system to support the evaluation of BDS Outcomes.

²⁷ MRC is the only river basin organisation among them whose mandate is specific to the Mekong River and its resources

Table 6.1: Alignment of priority areas of key regional cooperation mechanisms with BDS Outcomes

Regional Cooperation Mechanism	BDS Outcome(s)	Priority Areas relevant to the BDS
ASEAN (Water Resources Management)	3.1	IWRM Country strategy guideline and indicator framework implementation
	5.2	Public awareness and cross-sectoral coordination
	2.1	Water conservation
	1.1, 2.1	Water quality and sanitation
	4.1, 4.2	Water-related disasters
ASEAN (Nature Conservation and Biodiversity)	1.3	Key terrestrial biodiversity area conservation including protected areas
	1.3	Access and benefit sharing
ASEAN (Energy cooperation)	3.1, 3.2	ASEAN power grid
	3.1, 3.2	Renewable energy
	3.1, 3.2	Regional energy policy & planning
ASEAN (Climate change)	4.1, 4.2	Adaptation and resilience
	3.1, 4.2	Mitigation, technology transfer
	3.1, 3.2, 4.2	Climate finance
	3.1, 5.2	Cross-sectoral coordination and global partnership
ASEAN (Disaster management and emergency response)	1.1, 1.2, 4.2	Risk assessment and awareness
	1.1, 1.2, 4.2	Prevention and mitigation
	1.1, 1.2, 4.2	Preparedness and response
Greater Mekong Sub-region (GMS)	1.3	Natural resources and ecosystem services (advisory, technical and project services)
	3.1, 3.2	Power market integration (transmission links; market development; grid-to-grid trading; cross-border connections)
	2.2, 3.2	Agriculture (climate-smart, inclusive value chains; safe and environment friendly products)
	3.1, 4.2, 5.2	Climate resilience and disaster risk management (advisory, technical and project services; project investment)

Regional Cooperation Mechanism	BDS Outcome(s)	Priority Areas relevant to the BDS
MLC Water	3.1, 3.2	Water resources and green development
	4.2	IWRM and climate change adaptation
	3.1, 3.2	Water sector production capacity
	2.1, 2.2	Rural areas, water conservancy and livelihood improvement
	3.1, 3.2	Sustainable hydropower development and energy security
	3.1, 4.1, 5.2	Transboundary river cooperation and information sharing
	3.2, 5.2	Coordination with other areas
ACMECS	5.2	Environmental cooperation (water resource management, climate change, renewable energy, disaster risk management)
LMI / MUSP	4.1	Satellite-based data systems
	4.1	Data management and sharing
	4.1	Decision support tools
Mekong-Japan Cooperation	1.3, 4.1	Data collection for basin management and environment Conservation
	3.1, 4.2	Flood and drought management
	4.2	Disaster risk reduction
Mekong-ROK Cooperation	3.1, 4.2	Water security, flood and drought Management
	3.2	Hydropower management

6.3 Engagement of broader stakeholders

Extensive participation. During the preparation of this Strategy, wide and meaningful consultations were held at the national and regional level with broader stakeholders, including regional organizations and initiatives, development partners, universities, private sector, civil society organisations, and others. The full draft BDS and SP was made available to partners and CSOs in the region. Their views are considered in this BDS, which will be implemented by the basin countries and their regional cooperation mechanisms with direct involvement and engagement of broader stakeholders.

Direct involvement in BDS implementation. Non-governmental stakeholders (including academia, private sector entities, CSOs), can provide inputs to specific activities that will be implemented to produce the BDS Outputs, either as a member of the implementing team or as a participant in activity-related workshops and consultation meetings. There will be also opportunities for broader stakeholders to participate in meetings of the above joint basin expert groups and associated temporary task forces. The TORs of the existing expert groups provide opportunity for the participation of broader stakeholders, but the mechanisms need to be further elaborated.

Regular stakeholder forums. While the MRC Regional Stakeholder Forum will continue, efforts are needed to further streamline, synergize and synchronize other Mekong related stakeholder forums in order to maximize stakeholder inputs, reduce stakeholder engagement fatigue, and achieve common objectives of sustainable development of the Mekong. This Strategy promotes the ‘institutionalization’ of a Multiple Stakeholder Platform with the mandate to undertake regular stakeholder reviews of the implementation of the Strategy at the regional and national levels. A balanced representation of the many stakeholders in these forums will be important, as well as consistent recording, reporting, and impact tracking procedures. There will be a need also to raise awareness and provide understandable information in the local language to some society groups for them to have an equal voice during the forums.

Targeted stakeholder meetings on key issues of concern. This Strategy promotes the proactive organization by the water cooperation platforms of targeted meetings with specific stakeholder groups (such as CSOs, private sector, media and so on) whenever needed on major issues of concern, with a view to sharing information, discussing perspectives and viewpoints, and working towards consensus. To support such meetings, the web portals of the water cooperation platforms need to be modernized to function as a web-based decision support system (DSS) where stakeholders can follow changes in land and water conditions in the basin, integrate and visualize a wide range of data, and make changes in development scenarios and assess the impact of these changes on selected indicators. These meetings could also be brought under the proposed Multiple Stakeholder Platform which would streamline, synergize and synchronize Mekong related stakeholder forums.

Proactive unbiased information providers. All of the above will strengthen the role of the countries’ water cooperation platforms as honest basin managers on which people can rely on to provide even-handed information and advice on technical aspects and the conditions in the basin, and to pro-actively inform the people through web portals, social media, newspapers, and other media. This will also require the normalisation of greater and timely public disclosure and increased transparency about further use and development of public assets.



Only by the active, open and transparent involvement of all Mekong stakeholders can the Outcomes of the Strategy be realized, leading towards sustainable development, poverty alleviation and livelihood improvements.

6.4 Funding of BDS implementation

Financing development opportunities. Most of the development opportunities in the hydropower, navigation, irrigation, and industry (mining, forestry, tourism, aquaculture) sectors will be largely financed by the private sector (and 'state-owned companies') through debt and equity financing. In all of these areas, investment from the private sector now outweighs that from traditional public sources. In these sectors, governments have an important resource planning and management as well as regulatory role to ensure development is sustainable and beneficial for the country and its people. There will be opportunities for creating added value for water resource management (such as monitoring and data sharing) by improving private sector concessions and contracts.

Most of the development opportunities in the environmental and social sectors will need to be financed through national public budgets and international and regional loans and grants. There will be opportunities to benefit from innovative financing arrangements, such as attracting foreign carbon offsetting funds for reforestation of watersheds. The large needs for flood and drought protection will need to be integrated to the extent possible in already planned sectoral development together with the newly identified (joint) multi-purpose storage projects (for flood protection, hydropower, irrigation, navigation, and so on). The remainder will need to be financed through national public budgets with limited opportunities for Public-Private Partnerships (PPP) for financing infrastructure in the above sectors.

Funding of strategic priorities. The total estimated costs of the regional enabling outputs and activities (studies, assessments, planning) and transboundary non-structural investments (equipment, monitoring facilities) is in the range of USD 100 to 150 million. It is expected that these costs can be funded through international and regional grants, supplemented by national public budgets and private sector funding. Since the MRC will coordinate BDS implementation and implement most of the results chain, the above funding will contribute to the implementation of the MRC SP, either as unallocated, earmarked or associated funding. The other regional water cooperation mechanisms will manage their own budgets for the implementation of the water-related activities that could contribute to BDS Outcomes.

A Mekong Fund. The development of a regional Mekong Fund could be considered to attract funding from multiple sources to finance identified (joint) social and environmental investment opportunities of transboundary significance, as well as water-related disaster recovery. Potential sources, subject to further investigation, discussion and national regulations, could include contributions from the private sector, development partners, and new sources such as carbon financing. Experience from other regions indicates the institutional and legal underpinnings for a Mekong Fund are possible with sufficient political commitment in the basin countries. An operational Mekong Fund will enhance trust between the countries and unlock new opportunities for cooperative and joint water resources development. It would also help address ongoing social and environmental concerns about the potential transboundary impacts of development projects, and the need to help communities adapt to these changes.

6.5 Monitoring, evaluation and reporting

An integrated planning, monitoring, evaluation and reporting system (MRC's state of basin monitoring system) has been established by the MRC to track the implementation of the BDS 2021–2030. The system will have a practical dashboard to provide planners, decision makers, funders and other stakeholders with: (a) information about the overall health of the Mekong basin in five dimensions (environment, social, economic, climate and cooperation); (b) status and trends on key indicators that the BDS Outcomes and Outputs are trying to address, such as water flow and quality, food security, value of water sectors, climate resilience, and cooperation value and benefits; and (c) what contributions are being made to the relevant SDG targets (Figure 6.1).

The dashboard tracks progress towards Outcomes through a traffic light display aligned to the strategic and assessment indicators across the MRB-IF. These indicators will be evaluated and quantified every 5 years for the preparation of the SOBR. The SOBR records and evaluates the development impacts, positive and negative, within the Mekong River Basin as a measure of the effectiveness of the implementation of the BDS. The SOBR also provides decision-makers with answers to strategic questions related to the Strategic

Indicators of the Mekong River Basin, such as those listed in Table 6.2 (the targets and methodologies for answering such questions are defined in MRC's Procedures and the MRB-IF and related documents).

Basin Monitoring Status & Trend

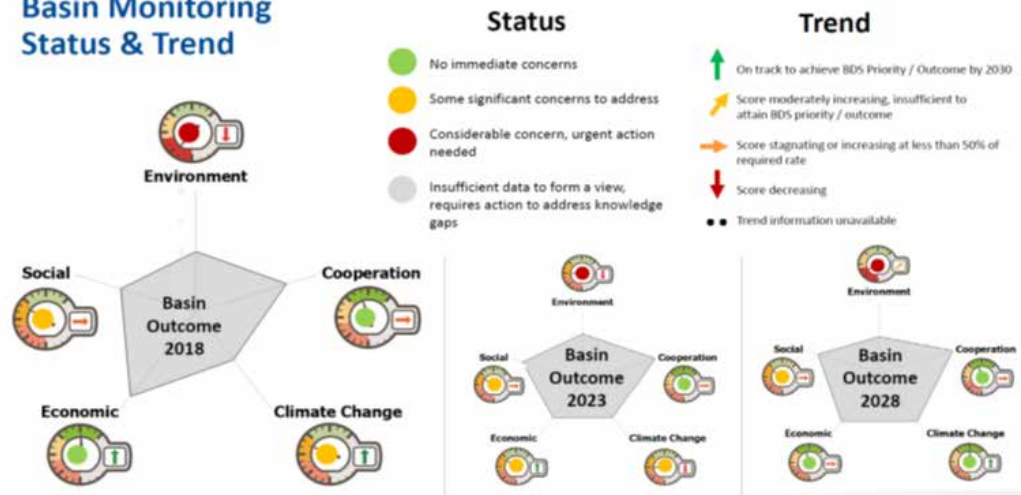


Figure 6.1. Sample representation of the MRC's dashboard for monitoring the status and trends in conditions across the basin

Table 6.2: Key strategic questions evaluated through five yearly State of Basin reporting

MRB-IF Dimension	Key Strategic Question
Environment	<p>Are the conditions of water flow and water quality in the Mekong mainstream acceptable?</p> <p>Are key environmental assets in the Mekong River Basin being adequately preserved and protected?</p>
Social	<p>What social benefits, direct and indirect, are being derived from water resource developments in the Mekong River Basin?</p> <p>How are the river-related livelihoods in each country being affected by land and water management decisions? Are men and women being impacted significantly differently?</p>
Economic	<p>What economic value does each Member Country derive from the use of the Mekong river system within the water-related sectors?</p> <p>How well does the Mekong river system contribute to water, food and energy security, and navigation for people and goods?</p>
Climate Change	<p>Do the current water-related development plans provide sufficient protection against mainstream and tributary floods and droughts?</p> <p>How resilient are people, wetlands and water infrastructure to climate change?</p>
Cooperation	<p>What is the added value of cooperation under <i>the 1995 Mekong Agreement</i> facilitated by MRC?</p> <p>How well is Mekong River Basin development moving towards optimal and sustainable development?</p>

Towards Mekong River Basin management objectives. The five-year SOBR, based on the MRB-IF, will assess achievement of the BDS Outcomes and progress towards the Mekong River Basin Vision, as well as the adjustments that need to be made in the next update of the BDS. The rollout of the MRB-IF and its set of strategic and assessment indicators in the entire Mekong River Basin, is the first step towards defining longer term basin management objectives and targets, and the means to achieve them through 10-year updates to the BDS.

PART

2

MRC STRATEGIC PLAN

INTRODUCTION

7.1 Purpose and scope of the Strategic Plan

This **Mekong River Commission Strategic Plan (MRC SP) for 2021–2025** is a unified corporate plan that is fully integrated with the BDS 2021–2030 through the implementation of the strategic basin planning cycle (Figure 7.1). A key characteristic of the cycle is the linkage between the five-yearly SOBR and the BDS, with the former recording and evaluating the development and management impacts (positive and negative) within the Mekong River Basin, and the latter aimed at the improvement of the conditions in the basin in the five dimensions of the MRB-IF: environment, social, economic, climate change, and cooperation.

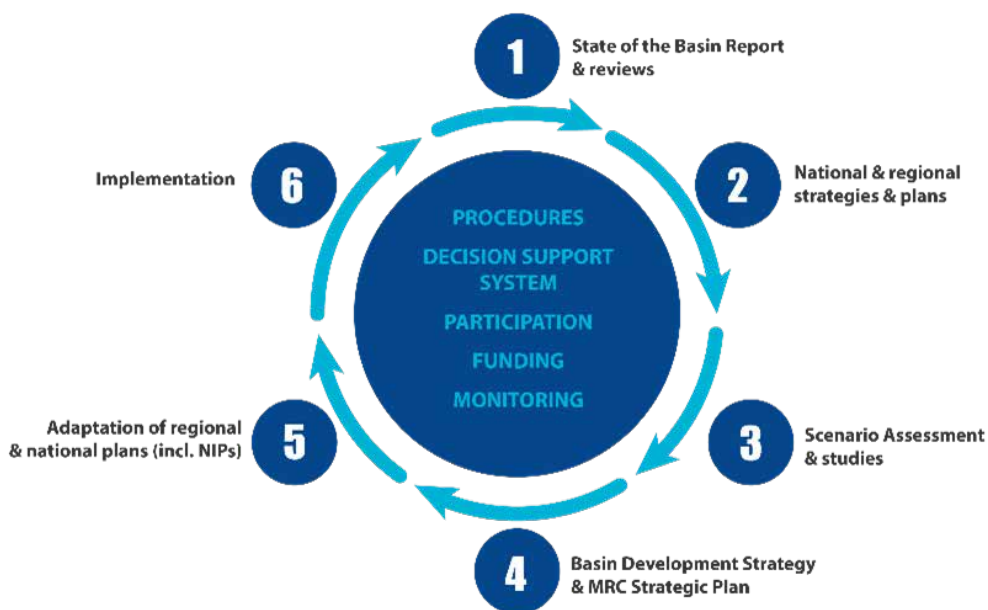


Figure 7.1. Mekong Basin strategic planning cycle

This MRC SP sets out how the MRC will contribute to the implementation of the BDS and strengthen the organization over the next five years:

1. The MRC will coordinate the implementation of the BDS and contribute to the delivery of most of its Outputs, some in cooperation with other regional cooperation mechanisms. Others will also contribute to BDS Outcomes and Outputs through activities and projects in their water-related priority areas (see Section 6.2);
2. The MRC will implement an organisational development plan to support national implementation of CRBMFs and the transition towards regional planning and management processes that are embedded in the national planning, decision-making and governance systems, and funded by the basin countries (see Chapter 9).

The role of the MRC is changing. In parallel with the development trajectory of the Mekong River Basin, the role of the MRC is changing from cooperation primarily on knowledge acquisition and sharing towards comprehensive cooperation on water resources development and management across the entire Mekong River Basin. This SP will support this shift in focus by guiding the implementation of:

1. **More proactive regional planning** which builds on the national plans to create synergies at the basin level within and between planned and new sectoral developments, including significant joint and national projects, to increase regional benefits, reduce regional costs, and provide a higher level of water security during dry and wet seasons;
2. **Support coordinated basin management operations** to prevent and manage water-related emergencies and support coordinated operations of infrastructure (such as hydropower cascades) in an increasingly developed basin susceptible to more extreme weather events. Although operations and oversight of operations are mainly a national responsibility, regional coordination is needed to realize the potential benefits and reduce costs for other countries;
3. **Modernisation of data and information acquisition, processing and sharing** by consolidating and modernizing the current fragmented water-related monitoring, modelling and information systems to a level that is fit-for-purpose for proactive regional planning and coordination of basin operations, and getting information to key stakeholders and the public;
4. **More integrated Mekong-Lancang management arrangements** including by setting up joint basin expert groups to oversee and direct the work streams in the above areas, and by increasing data sharing and cooperation between the two regional water platforms: MRC and MLC Water, with support of other partners and stakeholders.

Regional cooperation is intensifying. Proactive regional planning and coordination of basin management operations will shift transboundary cooperation to a level that emphasizes the adaptation of national plans to capture regional gains and mitigate regional costs through a continuum from unilateral action to coordination and collaboration and ultimately joint action, as illustrated in Figure 7.2. The Heads of State of the basin countries provided direction to the intensification of regional cooperation on regional water resources development and management at the Third MRC Summit in 2018 and at the Second Mekong-Lancang Cooperation Meeting in 2019.

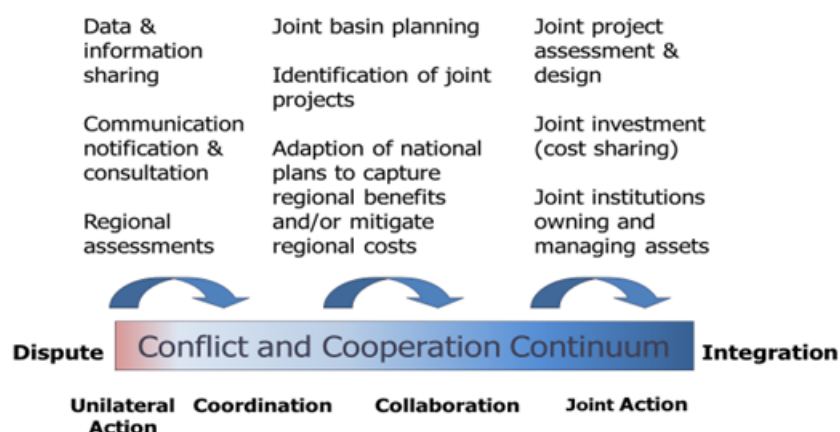


Figure 7.2. Conflict and cooperation continuum

The arrangements for the implementation of the MRC SP in Chapter 9 build on those of the previous MRC SP 2016–2020, with enhancements designed to benefit from the changing institutional landscape and the need to engage the national sector agencies more in the implementation of MRC SP activities (to improve uptake of regional Outputs and achieve the BDS Outcomes). A key mechanism for the implementation of this MRC SP is the enhancement of the existing MRC expert groups by involving technical leaders from all 6 basin countries.

Approach to MRC SP preparation. This MRC SP is formulated in parallel and based directly on the BDS 2021–2030, considering the recommendations from the Mid-Term Review of the MRC SP 2016–2020, as well as the institutional direction established by the MRC Decentralization Roadmap. Drafts of the integrated BDS and MRC SP have been shared with all relevant stakeholders and have benefitted from views and inputs from MRC Member Countries (NMCS and line/implementing agencies), development partners, Dialogue Partners, other regional cooperation mechanisms, the private sector, and

broader stakeholders including CSOs. The final version of the MRC SP has been negotiated by senior government officials from the Member Countries prior to consideration and approval by the Ministers in the MRC Council on behalf of their respective Governments.

7.2 Foundations of the MRC Strategic Plan

The foundations of the MRC SP are the *1995 Mekong Agreement*, the Third MRC Summit, the BDS 2021–2030, and the Regional Roadmap for Decentralisation.

The 1995 Mekong Agreement

Cooperation in the coordinated planning of the Mekong countries has a long history, dating back to the establishment of the Mekong Committee under the auspices of the United Nations in 1957. The *1995 Mekong Agreement* with its commitment to coordinated planning and joint management of the Mekong River Basin for its sustainable development raised this cooperation to a new level.

The *1995 Mekong Agreement* establishes the goals, objectives and underlying principles by which the four Member Countries have committed to cooperate (see Section 1.1). The Agreement establishes the MRC as the inter-governmental river basin organisation with the mandate to implement the Agreement and the projects, programmes and activities taken thereunder in cooperation and coordination with each member and the international community, and to address and solve related issues and problems.

Under the Agreement, the MRC has three principal organs: the MRC Council (ministerial level), Joint Committee (heads of department level), and the Secretariat (impartial staff and experts led by the CEO). To manage Mekong affairs internally and to facilitate Mekong cooperation, each Member Country has established a National Mekong Committee (NMC), comprising representatives of the relevant major line/implementing agencies, including foreign affairs, planning and investment, water/natural resources and environment, agriculture, fisheries and forestry, and energy, and supported by a secretariat (NMCS). The NMCS is attached to the ministry/office for water/natural resources and environment.

The Agreement charges the MRC with promoting and coordinating sustainable development, utilisation management and conservation of the Mekong's water and related resources. It also mandates the MRC to formulate a basin development plan to identify, categorise and prioritise the projects and programmes to seek assistance for and to implement at the basin level. The planning mechanism adopted by the MRC is the BDS, which will now be updated every ten years.

MRC Summits

Since 2010, the MRC has held every four years a Summit where Prime Ministers of its Member Countries meet. The Summits, in which the MRC Dialogue Partners also participate at the ministerial level, provide political support and direction to regional cooperation within the MRC framework as described in the *1995 Mekong Agreement*. A summary of the Summits and the key directions is provided below.

The First MRC Summit of Heads of Governments “Meeting the Needs, Keeping the Balance” held on 5 April 2010 in Hua Hin (Thailand) acknowledged that accelerating the development of water and related resources would make a significant contribution to the socio-economic development of the region. The key messages in the Summit Declaration align with the trade-offs between economic development, environment protection and social development, and launch the MRC toward financial self-sustainability by 2030.

At the Second MRC Summit held on 5 April 2014 in Ho Chi Minh City (Viet Nam) the Heads of Governments reaffirmed their commitment to implement *the 1995 Mekong Agreement* and consolidate the spirit of Mekong cooperation. The priority areas for action in the Summit Declaration are directed at expansion of cooperation in the region and provision of water and environmental security under climate change in the Mekong Basin.

At the Third MRC Summit, under the slogan of One Mekong One Spirit, the Heads of Governments of the MRC Member Countries reaffirmed their commitment to the MRC and its primary and unique mandate as well as the effective implementation of *the 1995 Mekong Agreement* (see Section 1.3). They provided key directions for basin development and management that have shaped the BDS 2021–2030 in terms of sustainable development opportunities and the results chain towards achieving the SDGs for the Mekong River Basin. They also reiterated their support to the organizational development of the MRC and for pursuing concrete cooperation with MLC Water, ASEAN and GMS towards a shared future.

The Basin Development Strategy 2021–2030

The BDS 2021–2030 as Part I of this document forms an integral part of this SP. The BDS sets out how water and related resources of the Mekong River Basin will be sustainably developed, utilised, managed and conserved over the period 2021–2030 from the shared perspectives of the LMB countries (Cambodia, Lao PDR, Thailand and Viet Nam) and in-line with their commitment to the *1995 Mekong Agreement*. This SP describes how the MRC will contribute to the implementation of the BDS.



1st Summit:

Meeting the Needs, Keeping the Balance

- ☐ Balancing development and protection
- ☐ Establishment of forecasting and warning systems
- ☐ Protection of food security and livelihoods
- ☐ Improvement of MRC Procedures implementation
- ☐ Cooperation with Dialogue and Development Partners
- ☐ MRC riparianisation and decentralization
- ☐ Stakeholder engagement and participation (IWRM)

2nd Summit:

Water, Energy and Food Security in the context of Climate Change

- ☐ Climate change mitigation and adaptation
- ☐ Managing flood and drought risks
- ☐ Transboundary, IWRM and nexus thinking
- ☐ Implementation of MRC Procedures
- ☐ Protect livelihoods and river ecology
- ☐ Implementation of Council Study
- ☐ Expanding cooperation with China and Myanmar, DPs and other initiatives

3rd Summit:

Joint Efforts and Partnerships towards Achievement of the SDGs in the Mekong

- ☐ Whole of basin management approach
 - ☐ Regional development opportunities and challenges
 - ☐ Addressing trade-offs, benefit sharing and risks
 - ☐ Strengthening of basin-wide monitoring network
 - ☐ Implementation of MRC Procedures
 - ☐ Uptake of MRC products
 - ☐ Cooperation with MLC, ASEAN and others
 - ☐ Organizational development of the MRC
-

Figure 7.3. Key directions from the Summit Statements

Regional Roadmap for Reform and Decentralisation

The Roadmap for reform and decentralisation (MRC Roadmap) sets out how the MRC as an organisation will develop over the period to 2030 to become a leaner, 'expert' organization funded by the Member Countries. This is to be achieved with increasing implementation of the CRBMFs by national line or implementing agencies in each member country in order to achieve regional objectives consistent with the *1995 Mekong Agreement*. The MRC has completed several of the recommendations in the MRC Roadmap and made good progress in others. The recommendation to reduce MRCS staff to 90-100 by 2020 was surpassed with about 64 staff in 2020.

This SP builds on this progress to guide implementation of the remaining decentralization agenda. It addresses issues with the capacity and funding of decentralized monitoring activities identified in the Mid-Term Review of the SP 2016–2020 and outlines requirements for the development and implementation of a major organizational development plan to strengthen the MRC. A strengthened MRC is required to enable increased cooperation with MLC Water for the purposes of integrated management of the whole Mekong River system by 2030, ensuring compatibility of systems, the sharing of data, information and knowledge, joint studies, assessments and reports and an integrated whole-of-basin monitoring network, as described in the BDS.





MRC RESULTS CHAIN

8.1 General

MRC's work areas. For the next five years, the MRC will focus its work on coordinating the implementation of the BDS 2021–2030 by all relevant actors, while contributing to the implementation of many of the Outputs itself. In this regard, MRC's priority areas of work are:

1. **Promotion and advice on identification, preparation and implementation of the BDS sustainable development opportunities** by national agencies and the private sector, in particular joint investment projects and national projects of basin-wide significance (see Section 6.1);
2. **Coordination of implementation of the five BDS strategic priorities** among relevant national implementing agencies, regional cooperation mechanisms and others. This includes advising how their broader water-related priority areas can contribute to BDS Outcomes (see Section 6.2);
3. **Contribution in whole or part to 28 BDS Outputs** by the MRCS, NMCs and national line/implementing agencies. Some of the Outputs will be delivered under existing and new cooperation agreements with regional cooperation mechanisms such as MLC Water, ASEAN and GMS (Section 6.2);
4. **Monitoring and evaluation of the implementation of the BDS and MRC SP.** MRC's monitoring systems cover implementation of the BDS (through impact monitoring and reporting in the SOBR) and the entire BDS results chain, through organizational monitoring especially the contribution of the MRC and others in achieving BDS Outcomes and Outputs (see Section 9.6).

MRC's Core Functions. The MRC will work in the above four areas by undertaking its core functions which provide guidance for what the MRC can do (in terms of activities, deliverables) in implementing the BDS (Figure 8.1). As defined in the Roadmap, the MRC's core functions include: (i) corporate services functions, (ii) CRBMFs, and (iii) consulting and advisory services functions. Corporate services functions include administration and management, facilitating dialogue and coordination, and reporting and dissemination. The CRBMFs are:

- CRBMF 1: Data acquisition, exchange and monitoring
- CRBMF 2: Analysis, modelling and assessment
- CRBMF 3: Planning support
- CRBMF 4: Forecasting, warning and emergency response
- CRBMF 5: Implementing MRC Procedures

Core routine and non-routine functions. The above corporate and CRBMFs are subdivided into activities that are either routine or non-routine activities in this MRC SP. Core routine activities are continuous or recurring activities that should be performed as a river basin organization. Core non-routine activities are new initiatives or one-off investments that are identified as part of the update of the BDS and MRC SP to address new challenges and opportunities, as well as to enhance the effectiveness of implementing the routine activities. These new strategic activities are essential to achieving the objectives of the MRC SP and Outcomes and Outputs of the BDS. The designation of core routine and core non-routine may become useful when making work plans and allocating available budgets (more below).

In Sections 8.2 to 8.6 of this MRC SP the key activities that need to be implemented by the MRC to deliver each BDS Output are identified along with milestones and the relationships with other Outputs. The key activities provide direction to MRC's multi-year work plans on the nature and scope of the tasks that need to be implemented and the resources that are required to implement these tasks.

Enabling tasks. There are a few essential 'enabling tasks' that are common to the delivery of most Outputs and are not shown in the tables with key activities in Section 8.2 to 8.6. These common enabling activities are aimed at knowledge sharing for decentralization of CRBMFs and at the uptake of MRC deliverables in national governance, decision-making and planning systems:

- Preparation of a tailor-made **consultation and capacity building plan** for the delivery of each Output, from the initial identification of the work plan with activities and tasks, to the uptake and use of the resulting Output by the 'client' (e.g. national implementing agency);
- Incorporation of the **impact pathway** that has been defined for each BDS Output (see Section 5.5) in the work plan of activities and tasks. An example of a typical impact pathway is presented in Figure 8.2. In particular, the first step of the impact pathway – the sign off by national implementing agencies on an informative concept note - is often forgotten, which makes the relevance and uptake of the Output uncertain from the beginning.

Figure 8.1. Results chain towards MRC core basin management function (CRBMF) activities

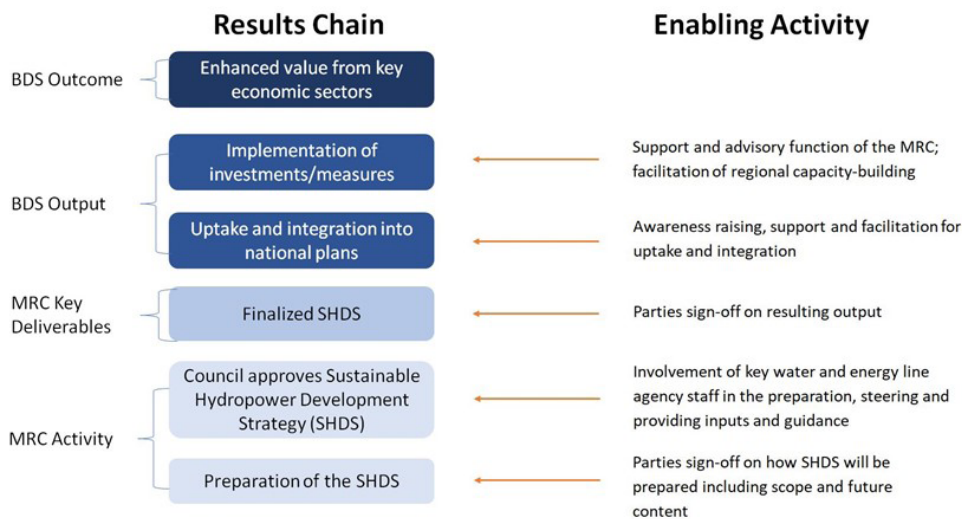


Figure 8.2. Impact pathway example with the existing Sustainable Hydropower Development Strategy in mind

The above enabling tasks were not always fully considered or implemented for past activities, which has hampered national uptake of MRC products or even led to the non-acceptance of MRC products by one or more countries. The implementation of these important MRC products figure prominently among the activities for 2021–2025 albeit with the understanding that their development approach may need to be revisited along the lines of the above impact pathway, starting with a policy discussion of what each country would like to see as a deliverable, Output, and Outcome.

Preparation of National Indicative Plans. Most activities in the SP results chain tables in Section 8.2 to 8.6 are of a regional nature and will be implemented by the MRCS with inputs and oversight by the appropriate national line/implementing agencies, including through MRC expert groups (and future joint basin expert groups). Some of the regional activities require substantial national implementation or inputs, and these are indicated with “NIP” in the ‘Lead Column’ of the tables in these sections, which means that the national implementation or inputs need to be defined and planned in the National Indicative Plans (NIPs).

Obvious examples for national implementation or inputs are: (i) the national activities for improving national uptake of regional strategies, guidelines, and action plans; (ii)

national implementation of MRC Procedures (such as information sharing, consultation, monitoring, and so on); (iii) the inventory of national water-related monitoring networks for regional consolidation and alignment; and (iv) capacity building related activities. The NIPs will include other useful information for regional planning as well listed in Section 6.2. The NIPs will be prepared as a 'rolling' NIP in 2020/2021 by the responsible national line or implementing agencies, coordinated by the NMCSs.

Phasing of Outputs and activities. It is noted that the Outcomes and Outputs defined in the BDS and used in the results chains in Section 8.2 to 8.6 are to be achieved by 2030. Few Outputs will be achieved earlier. The activities that are identified in the results chain are for implementation during the MRC SP period of 2021–2025 (five years). Many of the routine CRBMF activities will continue during 2026–2030. Also, some of the non-routine CRBMF activities will continue after 2025 if their implementation is phased over two SP periods. In 2025, new activities will be defined for 2026–2030 to achieve all Outputs by 2030.

8.2 Strategic Priority 1: Maintain the ecological function of the Mekong River Basin

Under this strategic priority, which is to maintain the ecological function of the Mekong in good condition, the BDS identifies and describes 3 Outcomes and 5 Outputs (see Sections 5.4 and 5.5). The tables below summarize the key deliverables (and timelines) that will be produced and the activities that will be implemented by the MRC to contribute to these Outcomes and Outputs. For the preparation of multi-year work plans, the activities under each Output will be further broken down into tasks, including the enabling tasks related to the impact pathway and the necessary stakeholder engagement and capacity building to ensure uptake (Section 8.1).

BDS Outcome 1.1: Adequate water flow and quality for a healthy environment and productive communities

To help achieve Outcome 1.1, the MRC will focus on supporting basin countries to improve the management of river flows and water quality in the mainstream and to mitigate the potential adverse impacts on the environment from water resources development. The activities identified are central to the MRC's mandate as specified in the *1995 Mekong Agreement* (including Article 3 on Protection of the Environment and Ecological Balance and Article 7 on the Prevention and Cessation of Harmful Effects) and build-on existing regional products and services developed over many years. They involve the MRC undertaking its assessment (CRBMF2), planning (CRBMF3) and procedures (CRBMF5) core functions.

These products and services include implementing the Procedures for the Maintenance of Flow on the Mainstream (PMFM), the Procedures for Water Quality (PWQ), the Procedures for Water Use Monitoring (PWUM), and various technical guidelines designed to help basin countries minimise adverse transboundary risks from water resources development on the broader environment. The uptake and mainstreaming within national systems of these regional products such as the updated Preliminary Design Guidance for Mainstream Dams (PDG), the Guidelines for Transboundary Environmental Impact Assessment (TbEIA), and the Joint Action Plans (JAPs) prepared through the PNPCA process for mainstream hydropower, is a focus of the work in this Strategic Plan period.

In relation to water flows, the current technical guidelines for the PMFM are silent on minimum flows in the flood season, maximum flows in the dry season and rapid river level fluctuations (including due to climatic variability) that are of increasing concern to basin communities. Revisiting the PMFM to take account of these issues, and to finalise and implement the guidelines through notification and appropriate country actions will help improve community confidence in the management of the river and contribute to better environmental outcomes. Ensuring the adequate reverse flow and other important functions of Tonle Sap will also be considered based on the further study of the Lake's requirements under Output 1.3.1.

The PWQ also needs revisiting considering technical aspects that have not yet been fully developed and implemented, specifically in relation to emergency water quality monitoring. This monitoring is essential to implement water quality related communication protocols to be developed under Output 4.2.1 and is growing in importance due to increased river traffic and the urbanisation and industrialisation taking place in parts of the basin. There are also emerging water quality issues such as plastic pollution where stakeholders expect further monitoring and information by the MRC to inform country management of the problem. Navigation and the transport of dangerous goods is one of the key channels through which water quality related emergencies could occur. Therefore, MRC support to the implementation of the Regional Action Plan for the Sustainable Transport of Dangerous Goods, through coordination and facilitation of agreed actions, will help improve the preparedness of all basin countries.

Monitoring water use through the PWUM will be greatly enhanced with the upgrading of the MRC's DSF and the increased use of earth observation and remote sensing technologies under Output 4.1.3. Improved accounting for how much water there is throughout the basin, where it is being used and what is available for further use towards increasing regional benefits or decreasing regional costs is within reach.

In relation to measures to mitigate the adverse impacts from water resources development, the MRC will continue to work with countries to integrate the various regional products developed over recent years into national systems. For instance, the TbEIA guidelines into national EIA policy and regulations, and the updated PDG into the planning and

management of hydropower, for countries that have agreed to do so. Where countries do not agree to endorse and implement these regional products yet, further work will be necessary to revisit the approach, including building more understanding and capacity, as outlined in Section 8.1.

Analysis and reporting on basin conditions, including river flows and water quality is a core function of the MRC and this is undertaken through a consolidated monitoring activity under Strategic Priority 4, including the hydro-meteorological monitoring and reporting, the routine water quality monitoring and reporting, and encompassing the Joint Environmental Monitoring (JEM) once that is fully integrated.

Strategic Priority 1: Maintain the ecological function of the Mekong River Basin

BDS Outcome 1.1: Adequate water flow and quality for a healthy environment and productive communities

BDS Output 1.1.1: Guidance for water flow and quality management implemented

MRC SP Deliverables

- ◆ Finalised PMFM technical guidelines including with additional flow thresholds (2023)
- ◆ Updated PWQ technical guidelines with additional methods in relation to emergencies and emergent issues (2023)
- ◆ Evaluation report on the implementation of the Regional Action Plan for the Sustainable Transport of Dangerous Goods (2024)
- ◆ Notifications and management actions in accordance with PMFM (as needed)
- ◆ Notifications and management actions in accordance with PWQ (as needed)
- ◆ Notifications and management actions in accordance with PWUM (as needed)

MRC SP Activities	Lead ²⁸	Related to Outputs ²⁹
1.1.1.1 Revisit PMFM and identify and evaluate potential new implementable flow thresholds (and methodologies) for guiding the monitoring and management of flow conditions in the mainstream (incl. for rapid river level fluctuations, minimum flood season, maximum dry season flows and to enable adequate reverse flow and other important functions of Tonle Sap)	TD-RFDMC	Outputs 3.1.1, 4.1.1, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 5.1.1

28 To be updated following approval of the revised MRCS structure by Member Countries (expected by 2021)

29 ‘Related to’ here refers to Outputs that have Activities that need to be implemented in an interdependent way with the Activities identified in the tables. This does not include ‘dependent’ relationships where the implementation is sequential or in parallel but not done in an interdependent way.

1.1.1.2 Implement PMFM guidelines including any updated or additional implementable flow thresholds	TD-RFDMC NIPs	All activities require inter-dependent implementation with activities under Outputs 4.1.1, 4.2.1, 4.2.2, 4.2.3, 4.2.4, 5.1.1
1.1.1.3 Review and update the PWQ including with new methods for identifying and monitoring water quality related emergency incidents (informed by recent experience) and emerging water quality issues (e.g. plastic pollution)	ED NIPs	
1.1.1.4 Implement PWQ guidelines including any new monitoring methods and parameters (e.g. for plastic pollution)	ED NIPs	
1.1.1.5 Support implementation of the Regional Action Plan for Sustainable Transport of Dangerous Goods	PD	Outputs 3.2.3, 4.2.3
1.1.1.6 Implement PWUM using upgraded DSF connected to ground, global and satellite datasets	TD-RFDMC	Outputs 4.2.2, 4.2.3
BDS Output 1.1.2: Guidance and measures for impact mitigation of water infrastructure implemented MRC SP Deliverables <ul style="list-style-type: none"> • Evaluation report on implementation and impact of PDG (2022) • Evaluation report on implementation and impact of JAPs (2024) • Evaluation report on implementation and impact of TbEIA guidelines (2024) • Evaluation report on implementation and impact of RSAT (2025) 		
Activities	Lead	Related to Outputs
1.1.2.1 Support use and integration of Preliminary Design Guidance in regional and national regulatory frameworks	PD NIPs	All activities require inter-dependent implementation with activities under Outputs 1.1.1, 1.2.1, 1.3.1, 2.1.2, 2.1.3, 2.1.4, 4.1.1, 5.1.1
1.1.2.2 Support implementation of Joint Action Plans for all mainstream hydropower projects	PD NIPs	
1.1.2.3 Support implementation of the Rapid Basin-wide Hydropower Sustainability Assessment Tool in Mekong tributaries	PD NIPs	
1.1.2.4 Support application and mainstreaming of the Guidelines for Transboundary Environmental Impact Assessment into national Environmental Impact Assessment systems and regulations	ED NIPs	

The activities under Outcome 1.1 can be implemented through the usual MRC delivery model which uses (individual) consultants, as needed, to support the work of the expert groups. The activities under Output 1.1 will be led and supervised by a senior staff or expert with a deep understanding of how all the Procedures should support and facilitate development and management planning in the Mekong River Basin (and thus the implementation of this BDS).

Some of the activities under Output 1.1.1 will be integrated with the pro-active regional planning activities under Outcome 3.1 that will provide basin-wide modelling and assessment inputs to test the feasibility of existing and new thresholds for monitoring and management of flow conditions in the mainstream. The phased approach to the

implementation of Output 3.1.1 means that the finalisation and implementation of the new flow limits may need to be revisited in the next MRC SP period. This should be considered in the planning for this activity as informed by the initial assessment work that is possible under activity 3.1.1.3.

Where identified in the table above, some of the activities will need to be incorporated into National Indicative Plans (NIPs) as they depend substantially on national actions for the Outcome and Outputs to be achieved. For instance, the implementation of regional products such as the TbEIA and PDG at the national level will need to be incorporated and budgeted for in the NIPs.

BDS Outcome 1.2: Sediment transport managed to mitigate bank erosion and maintain wetland and floodplain productivity

To help achieve Outcome 1.2, the MRC will focus on identifying the information available on sediment and erosion conditions throughout the basin and working with basin countries and partners on a basin-wide plan to mitigate the impacts of water resource development on sediment transport. The activities identified involve the MRC undertaking its assessment (CRBMF2) and planning (CRBMF3) core functions and are critical to helping basin countries minimise and mitigate harmful effects to the environment as required by Articles 3 and 7 of the *1995 Mekong Agreement*.

Enhanced monitoring of erosion, sedimentation and transport of sediments through the reinvigoration of the MRC's DSF and increased use of remote sensing products under Output 4.1.3 will support an improved understanding of the sediment problem, the locations of most concern (including the Mekong Delta), and the effectiveness of mitigation measures is an important input to policy and operational measures undertaken by basin countries.

Options to reduce sediment trapping and unsustainable sediment extraction need to be fully explored with basin countries and industry developers and operators on a reach-by-reach and project-by-project basis and based on a comprehensive study of sediment transport and riverbank erosion taking into account multiple interacting factors. These options will help inform the scenario assessment work under Output 3.1.1 and the development of a basin-wide sediment management plan to coordinate the actions of all relevant parties on addressing the problem. Coordination of infrastructure sediment flushing operations, where feasible, identifying priority riverbank protection areas, and enabling a more strategic and sustainable approach to sediment extraction activities throughout the basin are some of the key issues the plan will need to address.

Analysis and reporting on basin conditions, including sediment transport is a core function of the MRC and this is undertaken through a consolidated and integrated monitoring

activity under Strategic Priority 4, including the routine discharge and sediment monitoring and reporting activity, as well as with the new monitoring methods referred to here.

Strategic Priority 1: Maintain the ecological function of the Mekong River Basin		
BDS Outcome 1.2: Sediment transport managed to mitigate bank erosion and maintain wetland and floodplain productivity		
BDS Output 1.2.1: Basin-wide sediment management plan developed and implemented		
MRC SP Deliverables		
<ul style="list-style-type: none"> ◆ Inventory and report on recommended measures to reduce sediment extraction and sediment trapping (2022) ◆ Basin-wide sediment management plan based on results of a study of sediment transport and river-bank erosion, enhanced monitoring and alternative scenario assessments (2025) 		
MRC SP Activities	Lead	Related to Outputs
1.2.1.1 Undertake a study on sediment transport throughout the basin including on the sources and fate of sediments, the impact of existing and planned infrastructure and sediment extraction activities, and the extent and distribution of bank erosion	ED	Outputs 3.1.1, 4.1.1
1.2.1.2 Identify options for reducing sediment trapping at existing and planned dams and for reducing sediment extraction, taking into account the interacting factors that lead to bank erosion (for input to basin-wide scenario assessments)	PD and ED NIPs	Outputs 1.1.2, 3.1.1, 3.2.2, 4.1.1
1.2.1.3 Prepare a basin-wide sediment management plan based on a study of sediment transport and riverbank erosion, enhanced monitoring and initial scenario assessment work)	PD	Outputs 3.1.1, 4.2.1

The activities under Outcome 1.2 will be implemented as part of the proactive regional planning activities, which is led by PD, under Outcome 3.1. ED, TD-RFDMC and OCEO will actively collaborate with PD in a core team. With the oversight of the expert group on basin planning, the proactive regional planning activities will be outsourced to a consortium of companies which has the required qualifications and experience to perform the services for the formulation, modelling and assessment of the alternative basin-wide development scenarios and related activities in the environmental, economic, climate change and cooperation dimensions (Outputs 1.1.1, 1.2.1, 1.3.1, 4.1.1, 4.1.2, and 4.2.3). In the process, MRC’s modelling, assessment and data management capacities will be improved (Output 4.2.3). The phased approach to the implementation of Output 3.1.1 means that the finalisation and implementation of the sediment management plan may need to be revisited in the next MRC SP period. This should be considered in the planning

for this activity as informed by the initial assessment work that is possible under activity 3.1.1.3.

The preparation of the sediment management plan will include the assessment of the future spatial extent of bank erosion along the mainstream and in the Mekong Delta, as well as the evaluation of the options to reduce bank erosion. Extensive engagement with infrastructure developers and operators, and the sediment extraction industry and national regulators will be critical to the success of these activities and therefore requires inclusion within National Indicative Plans.

BDS Outcome 1.3: Ecosystem services from wetlands and watersheds ensured

To help achieve Outcome 1.3, the MRC will focus on developing mechanisms to better inform basin country decision-making about the impacts of development on key wetlands throughout the basin, and on building capacity to improve watershed management. The activities identified involve the MRC undertaking its assessment (CRBMF2) and planning (CRBMF3) core functions and are critical to helping basin countries minimise and mitigate harmful effects to the environment as required by Articles 3 and 7 the *1995 Mekong Agreement*.

In relation to wetlands, limits of acceptable change (a concept used under the *Ramsar Convention on Wetlands of International Importance* to inform policy makers and managers of changes to the ecological character of a site) is a mechanism that can be used to quantify the acceptable impacts on wetlands from development decisions. A better understanding of these impacts can be used to help inform regional discussions on benefits, costs and trade-offs, and facilitate an iterative process to scenario assessment through proactive regional planning under Output 3.1.1. The specific flow requirements for the good ecological function of the Tonle Sap Lake, including the early and quick flow into the lake and gradual flow out of the lake should be considered in this process.

In relation to watersheds, the role of the MRC is focused on supporting improved national planning and management through sharing of good practice including through country-to-country capacity building and helping to mainstream that practice at a national level. The identified activities build on the MRC's *Watershed Management Project* to consolidate good practice institutional, governance and regulatory arrangements related to land-use (i.e. agriculture, forestry, mining, urban planning and biodiversity), into a basin-wide framework with common minimum standards that basin countries can implement to help protect and conserve watersheds that contain environmental assets of regional importance. Some of these priority environmental assets have already been identified through the development of the SBEM.

Analysis and reporting on basin conditions, including wetlands and watersheds, is a core function of the MRC and this is undertaken through the implementation of the

Data Acquisition and Generation Action Plan (DAGAP) and SOBR under Strategic Priority 4. In support of Outcome 1.3, the monitoring, analysis and reporting under Priority 4 will be improved through the reinvigoration of the MRC’s DSF and greater use of earth observation and remote sensing products to evaluate and report on basin-wide changes.

Strategic Priority 1: Maintain the ecological function of the Mekong River Basin

BDS Outcome 1.3: Ecosystem services from wetlands and watersheds ensured

BDS Output 1.3.1: Limits of acceptable change for key river and connected wetland habitats identified and implemented

MRC SP Deliverables

- ◆ Proposed limits of acceptable change for key environmental wetland assets for input to alternative scenario assessments (2022)
- ◆ Updated management plans for key environmental wetland assets (2025)

MRC SP Activities	Lead	Related to Outputs
1.3.1.1 Identify and assess limits to adequately protect key regional environmental assets (i.e. wetlands) including consideration of early and quick flow into the Tonle Sap Lake and gradual flow out of the lake and other ecosystem functions and services, through engagement of scientific expertise, national agencies and local communities	ED	Outputs 3.1.1, 2.1.2, 2.1.3, 4.2.3
1.3.1.2 Support Member Countries in updating, developing and implementing management plans for priority regional environmental assets identified in the SBEM and other regional environmental strategies	ED NIPs	Outputs 1.3.2, 2.1.2, 2.1.3

BDS Output 1.3.2: A basin-wide planning and management framework for watersheds developed and implemented

MRC SP Deliverables

- ◆ Options report on best practice institutional, governance and regulatory arrangements for managing key regional watersheds (2023)
- ◆ Regional planning and management framework agreed for key regional watersheds (2025)

MRC SP Activities	Lead	Related to Outputs
1.3.2.1 Identify good practice institutional, governance and regulatory arrangements for the management of watersheds with opportunities for harmonisation and capacity building between countries	ED	

1.3.2.2 Develop a basin-wide planning and management framework for watersheds that include key regional environmental assets due to their role in providing regionally significant ecosystem services	ED	Output 3.1.1
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Most of the activities under Outcome 1.3 can be implemented through the usual MRC delivery model which uses (individual) consultants, as needed, to support the work of the expert groups. Gender-sensitive engagement with local communities will be important to identify initial proposed limits of change for wetlands (Output 1.3.1) that will be further developed through an iterative testing and evaluation process under Outcome 3.1.

The implementation of activities 1.3.1.1 and 1.3.2.2 will be integrated with the proactive regional planning activities under Output 3.1.1 that will provide useful basin-wide modelling and assessment inputs to: (i) test the feasibility of proposed limits of acceptable change and (ii) the characterisation of watersheds in terms of groundwater recharge, soil erosion and sediment loads, water storage potential, ecosystem services, susceptibility for flash floods and others. The phased approach to the implementation of Output 3.1.1 means that the finalisation and implementation of identified limits may need to be revisited in the next MRC SP period. This should be considered in the planning for this activity as informed by the initial assessment work that is possible under activity 3.1.1.3.

The current SBEM provides a mechanism to identify and integrate key regional environmental assets, both wetlands and watershed areas, into regional and national management frameworks. The activities under this Outcome will support the adaptive implementation of this and other regional environmental strategies. Where identified in the table above, some of the activities will need to be incorporated into National Indicative Plans (NIPs) as they depend substantially on national actions for the Outcome and Outputs to be achieved.

8.3 Strategic Priority 2: Enable inclusive access and utilisation of the basin’s water and related resources

Under this strategic priority, the BDS identifies and describes 2 Outcomes and 5 Outputs (see Sections 5.4 and 5.5). For four of these Outputs (those relevant to the MRC), the tables below summarize the key deliverables (and timelines) and activities that will be implemented by the MRC to contribute to these Outcomes and Outputs. For the preparation of work plans, the activities under each Output will be further broken down into tasks, including the enabling tasks related to the impact pathway and the necessary stakeholder engagement and capacity building to ensure uptake (Section 8.1).

Activities for Outputs 2.1.1 and 2.2.1 are not identified here as these are primarily the responsibility of other actors including ASEAN, the United Nations agencies, MLC Water (given its broader water sector focus), development partners and national agencies. They are nevertheless critical to the achievement of the *SDGs* as they relate to water resources management and development.

BDS Outcome 2.1: Strengthened water, food and energy security for basin community well-being

To help achieve Outcome 2.1, the MRC will utilise its fisheries expertise to support Member Countries manage risks to food security from excessive pressure on fish stocks. This includes pressure from potentially unsustainable fishing effort and practices as well as adverse impacts from water resources and other development. In addition, the MRC will support improved understanding of the gender and vulnerability aspects of basin water, food, and energy security. The activities identified involve the MRC undertaking its data collection (CRBMF1) and assessment (CRBMF2) core functions.

In relation to fisheries management, the MRC will seek to ensure key habitats are further incorporated into regional and national environmental strategies and plans, and support capacity building on institutional, governance and regulatory arrangements through country-to-country knowledge sharing and facilitating the implementation of agreed transboundary projects. The effectiveness of conservation measures at key habitats will be evaluated and additional monitoring conducted to inform fish stock assessments and understanding related socio-economic issues.

With data collected through the JEM programme and routine monitoring activities under Output 4.1.1, an evaluation of the effectiveness of existing fish passages on hydropower and irrigation structures (including those designed to be fish friendly) will be undertaken to help inform implementation of the PDG, JAP and TbEIA guidelines under Output 1.1.2 and the development of coordinated water infrastructure operating and communication protocols under Output 4.2.1. This evaluation will also support the scenario assessment work under Output 3.1.1 by reducing uncertainties of the impact of water resource development on fish populations and the associated risks to food security of people in vulnerable situations including in relation to climate change.

The MRC will undertake a basin-wide review on the gender and vulnerability aspects of basin water, food, and energy security, and coordinate the improved collection of disaggregated data and mapping on these issues. This is necessary to better understand uncertainties about the impact of water resources development on people in vulnerable situations and to support basin countries improve their data collection efforts in conjunction with

the implementation of the DAGAP under Output 4.1.5. The information will support the interpretation of results from the scenario assessment work under Output 3.1.1 and the development of projects for alternative livelihoods development under Output 5.2.2.

A focus on spatial and gender disaggregated data collection here is necessary to enable the identification and implementation of appropriate strategies to address inequities. We need to know where poor resource dependent people impacted by water resource development and management are located, how they are impacted, what is the root cause of their social disadvantage, and what the opportunities are to improve their resilience.

Analysis and reporting on basin conditions, including social wellbeing, is a core function of the MRC and this is undertaken through the implementation of the DAGAP (including SIMVA) and SOBR under Strategic Priority 4. In support of Outcome 2.1, this monitoring, analysis and reporting under Strategic Priority 4 will be improved through the reinvigoration of the MRC’s data and information systems under Output 4.2.2 and modifications to national surveys and other data collection exercises.

Strategic Priority 2: Enable inclusive access and utilisation of the basin’s water and related resources

BDS Outcome 2.1: Strengthened water, food and energy security for basin community well-being

BDS Output 2.1.1: Access and supply of safe water to people in vulnerable situations improved

This BDS Output is primarily the responsibility of other actors including ASEAN, UN, MLC Water (given its broader water sector focus), development partners and national agencies. No activities are identified for the MRC. The MRC will promote and monitor the overall BDS implementation.

BDS Output 2.1.2: Capture fisheries regulatory frameworks improved to support food security

- MRC SP Deliverables**
- ◆ Updated list in SBEM of key regional environmental assets relevant to critical fish habitats (2022)
 - ◆ National management plans for key regional environmental assets incorporate measures for conserving fish habitats (2025)
 - ◆ Completion reports for transboundary fisheries projects (2025)

MRC SP Activities	Lead	Related to Outputs
2.1.2.1 Review and incorporate important fish habitats into the network of key regional environmental assets and their management plans and evaluate the effectiveness of conservation measures including in relation to vulnerability to climate change	ED NIPs	Output 1.3.1

2.1.2.2 Support enhanced institutional, governance and regulatory arrangements within national and provincial fisheries management frameworks including socio-economic monitoring and research on fisheries related issues such as fish stock assessments	ED NIPs	
2.1.2.3 Support agreed transboundary fisheries management projects	ED NIPs	
BDS Output 2.1.3: Risks to capture fisheries productivity and diversity minimised to support food security		
MRC SP Deliverables <ul style="list-style-type: none"> ◆ Recommended actions for improving fish passage or other adaptation measures for hydropower and irrigation structures (2023) ◆ Evaluation report on the uptake of recommended actions for improving fish passage or other adaptation measures (2025) 		
MRC SP Activities	Lead	Related to Outputs
2.1.3.1 Evaluate the effectiveness of existing fish passages for hydropower and irrigation structures (including by working with developers) and potential alternative designs in relation to the unique fish ecology of the basin	ED and PD	Outputs 1.1.2
2.1.3.2 Support national uptake of recommended actions and guidelines (including by working with developers) for improving fish passage or other adaptation measures for hydropower and irrigation structures	ED and PD NIPs	Outputs 1.1.2, 3.2.2
BDS Output 2.1.4: Gender and vulnerability aspects of basin water, food and energy security addressed		
MRC SP Deliverables <ul style="list-style-type: none"> ◆ Report on gender and vulnerability related to water resources development, including recommendations on additional disaggregated data needs (2021) ◆ Relevant data collected on people in vulnerable situations (incl. women) impacted by water resources development (2024) ◆ Report on improving equity for vulnerable groups, including recommended measures for regional and national plans (2025) 		
MRC SP Activities	Lead	Related to Outputs
2.1.4.1 Undertake a desk review and analysis, in collaboration with relevant partners, of the multiple gender and vulnerability aspects of basin water, food and energy security (including indigenous and minority ethnic groups) identifying specific needs, challenges and opportunities and including recommendations on cost effective and priority gender disaggregated data and vulnerability mapping requirements	PD	Output 4.2.5

2.1.4.2 Enhance national disaggregated data collection and mapping on gender and vulnerability within the Data Acquisition and Generation Action Plan, including to inform SDG reporting	PD NIPs	Output 4.2.5
2.1.4.3 Analyse data and information and provide recommendations on improving equity for vulnerable groups	PD	

The capture fishery activities under Outputs 2.1.2 and 2.1.3 can be implemented through the usual MRC delivery model which uses (individual) consultants, as needed, to support the work of the expert groups. Output 2.1.2 relates to improving national and sub-national systems of fisheries management and so requires extensive engagement with sub-national authorities and local fisheries bodies. Output 2.1.3 will be informed by the work of the Joint Environmental Monitoring of mainstream hydropower and other water infrastructure projects, including improvement of fish passes for irrigation schemes.

The implementation of the activities related to gender and vulnerable people under Output 2.1.4 depends on being successful in working with the responsible national agencies to collect the required disaggregated sub-national data for identifying poor natural resource users, determining where the vulnerabilities lie, and how they could benefit from national social and economic development policies and programmes, including investments in conjunction with (joint) water resources development projects. Most of the activities in the table above will need to be incorporated into National Indicative Plans (NIPs) as they depend substantially on national actions for the Outcome and Outputs to be achieved.

BDS Outcome 2.2: Increased employment and reduced poverty among vulnerable people dependent on river and wetland resources

Strategic Priority 2: Enable inclusive access and utilisation of the basin's water and related resources

BDS Outcome 2.2: Increased employment and reduced poverty among vulnerable people dependent on river and wetland resources

BDS Output 2.2.1: Alternative and sustainable livelihood strategies for poor, resource dependent communities impacted by water resources development and management prepared and implemented at national levels

This BDS Outcome and Output are primarily the responsibility of other actors including ASEAN, MLC, development partners and national agencies. No activities are identified for the MRC. The MRC will promote and monitor the overall BDS implementation.

The implementation of livelihood strategies and programmes is a national responsibility and so this activity will need to be incorporated into National Indicative Plans (NIPs) for the Outcome and Outputs to be achieved.

8.4 Strategic Priority 3: Enhance optimal and sustainable development of water and related sectors

Under this strategic priority, the BDS identifies and describes 2 Outcomes and 6 Outputs (see Sections 5.4 and 5.5). The tables below summarize the key deliverables (and timelines) and activities that will be implemented by the MRC to contribute to these Outcomes and Outputs. For the preparation of work plans, the activities under each Output can be further broken down into tasks, including the enabling tasks related to the impact pathway and the necessary stakeholder engagement and capacity building to ensure uptake (Section 8.1).

BDS Outcome 3.1: Increased economic growth of all basin countries from more proactive regional planning

To help achieve Outcome 3.1, the MRC will work with basin countries during this MRC SP period to commence a comprehensive basin-wide planning exercise. This will differ from previous planning efforts in that it will institute a more proactive approach which does not just reactively assess the impacts of existing national plans (which were already assessed under the BDP programme and Council Study) but also identifies new potential investment projects for the countries to consider. These projects might include additional storage capacity above existing hydropower cascades, relocation or design changes to previously identified dams and other water infrastructure, rehabilitation of floodplain wetlands, and joint investment projects where more than one country can share the benefits and the costs. The activities identified involve the MRC undertaking its assessment (CRBMF2) and planning (CRBMF3) core functions and are critical to helping basin countries achieve the sustainable development, utilisation, management and conservation of the water and related resources of the Mekong River Basin under Article 1 (optimize the multiple-use and mutual benefits of water and related resources) and Article 2 (formulation of a basin development plan of basin-wide projects) in the *1995 Mekong Agreement*.

Together the following interdependent set of activities will provide the information that the countries need to discuss the trade-offs and benefits of adapting national plans with new joint infrastructure and significant national projects to increase regional benefits and reduce regional costs under Output 5.2.2 while providing a comprehensive response to: (i) climate change through reducing flood and drought risks and (ii) the need for coordination of basin management operations. The additional information should enable increased flexibility for basin countries to adapt their national plans, subject to sovereign decision-making processes, in a way which provides win-win outcomes.

Strategic Priority 3: Enhance optimal and sustainable development of water and related sectors

BDS Outcome 3.1: Increased economic growth of all basin countries from more proactive regional planning

BDS Output 3.1.1: BDS Output 3.1.1: The Basin Development Plan and associated national plans for water resources development are informed by the findings of a more proactive regional planning approach

MRC SP Deliverables

- ❖ Comprehensive Concept Note with Terms of Reference for proactive regional planning work including integration of activities under other relevant Outputs in SP1, SP4 and SP5 (2021)
- ❖ Storage identification and assessment report for the formulation of basin-wide scenarios (2022)
- ❖ Scenario formulation and assessment methodology report (2023)
- ❖ Report on the results of the initial assessment of alternative basin-wide development scenarios (2024)

MRC SP Activities	Lead	Related to Outputs
3.1.1.1 Assess options for water resources development including increasing natural and constructed water storage to support water security, irrigation, hydropower, fisheries and environmental outcomes, using GIS/EO technology and field work	PD	All activities implemented in conjunction with Outputs: 1.1.1, 1.2.1, 1.3.1, 1.3.2 4.1.2, 4.1.3, 4.1.5, 4.2.1, 4.2.2 5.2.2
3.1.1.2 Formulate basin-wide development scenarios (in addition to previously assessed national plans) with alternative development options, considering gender and vulnerability, and update the existing basin-wide assessment methodology	PD	
3.1.1.3 Initial assessment of the agreed basin-wide development scenarios for environment, social and economic outcomes and the distribution of benefits and costs, including with the use of socio-economic and vulnerability mapping	PD	

The implementation of the activities under Output 3.1.1 will be supported by a competitively selected company (or consortium) which has the required qualifications and relevant experience to perform the services for the formulation and assessment of the alternative basin-wide development scenarios and interdependent activities in the environment and climate change dimensions. While the work will commence in this MRC SP period, with an initial assessment being feasible by 2025, due to possible resource constraints it is expected a full assessment will need to continue into the next MRC SP period (2026-2030).

The services of the consortium will be coordinated and managed by the MRCS and directed and overseen by the expert group for regional planning and coordinated basin management operations and their line/implementing agencies. The multi-year work plans will maximize the engagement, and help build the capacity, of line/implementing agencies and other stakeholders throughout the implementation process to ensure national uptake, starting with the review and approval of a detailed TOR of the company/consortium.

The interdependent set of activities related to this Output include: (i) the development of the sediment management plan (Output 1.2.1); (ii) modelling and assessment services for testing the feasibility of additional flow thresholds (Output 1.1.1) and limits of acceptable change for key river and connected wetland habitats, including the Tonle Sap River and Lake (Output 1.3.1); (iii) modelling and assessment services for the characterisation of watersheds in terms of groundwater recharge, soil erosion and sediment loads, water storage potential, ecosystem services, susceptibility to flash floods and others (Output 1.3.2); (iv) modelling and assessment services for supporting the development of operating protocols for dams and flood and drought mitigation to achieve multiple benefits (Output 4.2.1); and (v) modelling and assessment services for flood protection and conveyance (Outputs 4.2.1 and 4.2.2). In the process, MRC's modelling, assessment and data management capacities will be improved (Output 4.1.3). Due to the phased delivery of the assessment work under activity 3.1.1.3, the completion of these other activities will also extend into the next MRC SP period.

BDS Outcome 3.2: Enhanced inclusive growth and sustainability in irrigated agriculture, hydropower, navigation, environment and fisheries sectors

To help achieve Outcome 3.2, the MRC will coordinate the work of the basin countries in implementing the regional sector strategies and help facilitate the identification and implementation of investments and associated measures in irrigated agriculture, sustainable hydropower, navigation, environmental and fisheries management. Preparation of the investments themselves are not undertaken by the MRC, as that is the role of other public and private actors in each Member Country, supported by development partners and MLC Water, as appropriate. The MRC instead undertakes its coordinator role to help achieve the sustainable development, utilisation, management and conservation of the water and related resources of the Mekong River Basin under Article 1 of the *1995 Mekong Agreement*. The activities identified involve the MRC's planning (CRBMF3) core function.

In relation to irrigated agriculture, the focus of MRC's work is on supporting sustainable investment opportunities. This includes coordinating regional and international expertise and best practice in the development of guidelines for transboundary groundwater management; and identifying irrigation development opportunities to support climate change adaptation and improved food security including through climate smart agriculture

and a transition to higher value and environmentally friendly agriculture products. While there may be opportunities to expand irrigation areas, it is likely much of the investment opportunities will involve improving efficiency and upgrading of existing infrastructure.

The implementation of the Sustainable Hydropower Development Strategy (SHDS) is a key mechanism for achieving greater alignment between regional water resources and energy sector plans. The MRC will promote the Strategy's uptake at a national level but also support implementation by assessing alternative system integration options that can inform potential updates to national water resources and energy sector plans in conjunction with more proactive regional planning under Output 3.1.1. This work is necessary to ensure new power generation plans consider the full range of viable generation sources, including complementary use of wind and solar, and that supply does not run too far ahead of demand. The MRC will also engage with ASEAN, GMS and others under Output 5.2.3 to ensure alignment with other regional plans related to energy.

In relation to navigation, the MRC will help coordinate the implementation of the MRC *Masterplan for Regional Waterborne Transport in the Mekong River Basin* in alignment with the JCCCN Development Plan on International Navigation on *the Lancang-Mekong River (2015–2025)*. To maximise the value of increased navigation it is important these two plans are implemented in synergy as harmonised rules and procedures will help improve efficiency, safety and capacity. The MRC will act as an honest broker to the competent authorities in each basin country to facilitate this transboundary harmonisation process and the coherent scheduling and implementation of investments that support the sustainable development of the sector. The MRC will also engage with ASEAN, GMS and others under Output 5.2.3 to ensure alignment with other regional plans related to transport.

In relation to environmental management and fisheries, the MRC will facilitate joint planning and capacity building between countries to identify sustainable investment opportunities, help countries adapt to the changing circumstances in the basin, and facilitate the implementation of investments in conjunction with the joint investment projects and national projects of basin-wide significance identified under Output 5.2.2 (and to support the achievement of Outcomes 1.3 and 2.1). Coordinating the implementation of the SBEM and the *Basin Fisheries Management Strategy* will help increase regional benefits and decrease regional costs including through improved consideration of the value of ecosystem services from wetlands and watersheds (e.g. developing and implementing assessment methodologies with appropriate indicators). The MRC will also engage with ASEAN, GMS and others under Output 5.2.3 to ensure alignment with other regional plans related to environment and fisheries.

Strategic Priority 3: Enhance optimal and sustainable development by increasing regional benefits and decreasing regional costs

BDS Outcome 3.2: Enhanced inclusive growth and sustainability in irrigated agriculture, hydropower, navigation, environment and fisheries sectors

BDS Output 3.2.1: Irrigated agriculture investment and associated measures implemented

MRC SP Deliverables

- ◆ Regional guidelines for sustainable groundwater management (2023)
- ◆ Policy paper on measures in irrigated agriculture to adapt to climate change and improve food security (2024)

MRC SP Activities	Lead	Related to Outputs
3.2.1.1 Coordinate development of guidelines on sustainable transboundary groundwater management and support implementation through country-to-country capacity building	PD	Output 2.1.1
3.2.1.2 Identify opportunities, promote and provide guidance on irrigation development opportunities, for adaptation to climate change, improved food security, and reduced inequity	PD	Outputs 3.1.1, 2.1.2

BDS Output 3.2.2: Sustainable hydropower development strategy and related regional energy plans implemented in synergy

MRC SP Deliverables

- ◆ Identification and assessment report on alternative cost-effective regional energy/water system integration options (2022)
- ◆ Evaluation report on the implementation of the Sustainable Hydropower Development Strategy (2024)

MRC SP Activities	Lead	Related to Outputs
3.2.2.1 Support implementation of the SHDS and coordinate and promote alignment with regional energy plans (incl. GMS and ASEAN)	PD NIPs	
3.2.2.2 Assess alternative cost-effective regional energy/water system integration options (e.g. floating solar with hydropower, seasonal storage, etc.) within the context of broader energy sector plans including solar and wind and as informed by comprehensive regional options assessment(s) by countries and other regional actors (ASEAN, GMS, etc)	PD	Output 3.1.1

BDS Output 3.2.3: Basin navigation plans implemented in synergy**MRC SP Deliverables**

- ◆ New and updated navigation rules between Laos and Thailand and between Cambodia and Viet Nam (2022)
- ◆ Evaluation report on implementation of Navigation Master Plan taking into account the alignment and synergy with the JCCCN Development Plan (2024)

Activities	Lead	Related to Outputs
3.2.3.1 Support the implementation of the MRC <i>Masterplan for Regional Waterborne Transport in the Mekong River Basin</i> in alignment with the JCCCN Development Plan on International Navigation on the Lancang-Mekong River (2015-2025) in consultation with all basin countries	PD	Output 1.1.1
3.2.3.2 Facilitate the harmonisation of navigation rules and regulations between LMB countries and support national implementation	PD NIPs	
3.2.3.3 Facilitate and coordinate navigation investments including for tourism purposes in accordance with existing or updated plans	PD NIPs	Output 3.1.1

BDS Output 3.2.4: Regional environmental strategies and programmes implemented in synergy**MRC SP Deliverables**

- ◆ Technical note and guidelines on leveraging ecosystem services from wetlands and watersheds through alternative financial mechanisms (2023)

MRC SP Activities	Lead	Related to Outputs
3.2.4.1 Support the implementation of the SBEM and investment projects and associated measures for the conservation and promotion of wetlands and watersheds, including for climate resilience	ED NIPs	
3.2.4.2 Raise awareness, build knowledge and capacity in leveraging ecosystem services from wetlands and watersheds through alternative financial mechanisms including carbon offsets, and ecotourism	ED	Output 1.3.2

BDS Output 3.2.5: Investment and associated measures to adapt to changes in fish populations and catch composition identified and implemented**MRC SP Deliverables**

- ◆ Policy paper on options for investment and associated measures to optimise fisheries production under changed river conditions (2023)

MRC SP Activities		Related to Outputs
3.2.5.1 Support the implementation of investments and associated measures to enhance fisheries consistent with the BFMS	ED NIPs	Outputs 2.1.2, 2.1.3

3.2.5.2 Explore alternative futures for fish populations and catch composition resulting from water resources development and climate change and identify options to adapt to these changes and maintain viable fish populations (including consideration of aquaculture development and trade)	ED	Outputs 2.1.2, 3.1.1
3.2.5.3 Evaluate investments and other options to maximise fisheries production under changed river conditions as a result of water resources development and climate change, and support the preparation of identified investments	ED NIPs	

The activities under Outcome 3.2 are designed to implement the relevant, important and urgent recommendations in the existing MRC regional sector strategies. These activities can be implemented through the usual MRC delivery model which uses (individual) consultants, as needed, to support the work of the expert groups. For the implementation of the activities under Output 3.2.5, ‘visionary’ experts will be engaged who can help national and local stakeholders think ‘outside the box’ on the opportunities for the capture fisheries sector in a different land and waterscape in the Mekong River Basin. The various activities need to be carefully planned in the rolling two-year work plans to capture the synergies with the related activities under the other Outcomes. It is expected that by 2025, the new information produced under the other Outcomes will render the existing regional strategies obsolete. Preparing and implementing investments in economic sectors will need to be incorporated into National Indicative Plans (NIPs) for the Outcome and Outputs to be achieved. This includes investments in national masterplans of relevant sectors which may also inform future updates to regional strategies.

8.5 Strategic Priority 4: Strengthen resilience against climate risks, extreme floods and droughts

Under this strategic priority, the BDS identifies and describes 2 Outcomes and 7 Outputs (see Sections 5.4 and 5.5). The tables below summarize the key deliverables (and timelines) and activities that will be implemented by the MRC to contribute to these Outcomes and Outputs. For the preparation of work plans, the activities under each Output can be further broken down into tasks, including the enabling tasks related to the impact pathway and the necessary stakeholder engagement and capacity building to ensure uptake (Section 8.1).

BDS Outcome 4.1: Better informed and prepared basin communities against changing river conditions, and more frequent and severe floods and droughts

To help achieve Outcome 4.1, the MRC will focus on improving, and continuing to implement, the regional systems for informing people about basin conditions and supporting the MRC assessment and planning functions under the other strategic priorities. These systems include the monitoring networks, data and information management, modelling and decision support systems, forecasting and early warning, and data generation, sharing, analysis and reporting across all dimensions of the MRB-IF and this BDS. The activities identified provide a foundation for the sustainable development, utilisation, management and conservation of the water and related resources of the Mekong River Basin under Article 1 of the *1995 Mekong Agreement*, and mainly involve the MRC undertaking its data collection, monitoring (CRBMF1) and forecasting (CRBMF4) core functions.

The MRC will manage the design and implementation of a core river monitoring network for the mainstream that is tightly integrated with national monitoring networks to ensure the timely availability of all necessary data to support basin planning and operational management. This core network of stations and data collection points will utilise existing on-ground data collection in conjunction with increased use of earth observation and remote sensing products through the reinvigoration of the MRC's DSF under Output 4.1.3.

Upgrading data and information management systems is essential to the effective use of the data collected under Outputs 4.1.1 and 4.1.5 and supports the exchange and sharing of data between basin countries and with stakeholders in an easily understandable way. It will enable improved analytical capacity and the ability of MRC and basin countries to inform the public about changes they are seeing, what the causes of those changes are, and how they are being managed.

Any DSS (currently referred to as DSF at MRC) will require periodic renewal and upgrade to ensure it remains current under evolving basin conditions and has capacity to support the changing needs of its users. The reinvigoration of DSS's at national and regional level will enable compatibility between countries that already operate state of the art systems and those that do not. It will support the MRC's water diplomacy role by facilitating a common understanding of basin conditions and scenario assessments.

Improved flood and drought forecasting and early warning will be done by the MRC through improved accuracy and extension of period of forecast, identifying the additional data requirements for improved accuracy and relevance and to support a broader range of services to its clients in the countries, including vulnerable groups in easy to understand language and methods. The MRC will also enhance these systems in conjunction with the core river monitoring network under Output 4.1.1, improved data and information management under Output 4.1.2 and reinvigorated MRC DSF under Output 4.1.3.

Integrating the Joint Environmental Monitoring into routine river monitoring activities of the MRC will improve our understanding of the environmental impacts of the construction and operation of water infrastructure and what can be done to minimise adverse impacts. Enhanced monitoring of erosion, sedimentation and transport of sediments should lead to more cost-effective sediment monitoring in future and support a comprehensive basin-wide plan to manage sediments under Output 1.2.1.

Analysis and reporting on basin conditions (including in response to climatic variability) is a core function of the MRC and this is undertaken for all strategic priorities through the implementation of activities under this Outcome. This includes hydro-meteorological, discharge and sediment, water quality, fisheries, ecological health monitoring and the JEM, along with the implementation of the DAGAP (including SIMVA) to ensure a comprehensive and up-to-date SOBR can be delivered in 2023.

Strategic Priority 4: Strengthen resilience against climate risks, extreme floods, and droughts

BDS Outcome 4.1: Better informed and prepared basin communities against changing river conditions, and more frequent and severe floods and droughts

BDS Output 4.1.1: A core river monitoring network for the mainstream and remaining national river monitoring networks consolidated

MRC SP Deliverables

- ◆ Reports of core river monitoring activities (hydrology, water quality, EHM, fisheries, sediment (annual, as needed)
- ◆ Enhanced monitoring methods for erosion, sedimentation, and sediment transport (2022)
- ◆ Evaluation report on implementation of JEM Programme, including assessment of environmental changes (2022)
- ◆ Design report of the core river monitoring network (including JEM integration) (2022)
- ◆ Evaluation of the operation of the core mainstream monitoring network (2025)

MRC SP Activities	Lead	Related to Outputs
4.1.1.1 Assess, redesign and develop the basin’s core river monitoring network, incorporating JEM, for regional and national planning and management based on a comprehensive network analysis informed by current and future needs	ED and TD-RFDMC NIPs	Outputs 1.2.1, 4.1.4
4.1.1.2 Strengthen capacity and commitment for the consolidation and enhancement of nationally managed river monitoring networks	ED and TD-RFDMC	
4.1.1.3 Implement river monitoring network, analysis and reporting activities (hydro-meteorological, discharge and sediment, water quality, fisheries, and ecological health) including the Joint Environmental Monitoring of mainstream hydropower and other water infrastructure and enhanced monitoring of erosion, sedimentation and transport of sediments	ED and TD-RFDMC	Output 1.2.1, 1.2.2

BDS Output 4.1.2: Integrated data and information systems for more effective basin-wide data management and sharing

MRC SP 2 Deliverables

- ◆ Data and information in standard format (2022)
- ◆ Integrated and updated databases and QA/QC procedures (2023)
- ◆ Satellite imagery repository for water resource application (2021-2023)

MRC SP Activities	Lead	Related to Outputs
4.1.2.1 Complete inventory, standardisation, harmonisation and update of data, information and documents and migrate them into integrated databases with improved QA/QC procedures	TD-RFDMC	
4.1.2.2 Upgrade remote sensing and satellite imagery repository and develop capacity of handling and using satellite products for water resource application	TD-RFDMC	Output 4.1.3
4.1.2.3 Operate and maintain integrated databases, information, systems and tools at regional and national levels	TD-RFDMC	Output 4.1.3

BDS Output 4.1.3: Compatible Decision Support Systems in line with reinvigorated data, modelling, forecasting, and communication capabilities

MRC SP Deliverables

- ◆ Design report for reinvigorated and aligned DSS's at regional and national levels (2022)
- ◆ Upgraded MRC DSF, aligned at regional and national levels (2023)
- ◆ Comprehensive spatial datasets for digital maps (including land cover) of the LMB (2023)
- ◆ Enhanced MRC Web Portal with data portal and digital library in line with upgraded DSF (2022-2023)
- ◆ Operation of modelling and assessment tools (2024)

MRC SP Activities	Lead	Related to Outputs
4.1.3.1 Further study the design, management and use of the region's DSS's and plan a regional system of compatible DSS's (MRC's DSF and Member Countries', as well as linkages to DSS's in Upper Mekong River Basin countries)	TD-RFDMC and PD	
4.1.3.2 Upgrade the MRC's Decision Support Framework with the latest international standards and technologies in order to serve both planning and operational management purposes, building on the reinvigoration of MRC's data, information, modelling and communication systems	TD-RFDMC and PD	These activities implemented in conjunction with Output 3.1.1
4.1.3.3 Maintain and operate modelling and analysis tools including the updated ones as part of the upgraded MRC DSF (e.g. production of spatial datasets)	TD-RFDMC	
4.1.3.4 Maintain and operate web-based DSF (including communication tools, improved MRC Web Portal, and development of apps) in support of decision-making and targeted active public communication	TD-RFDMC and OCEO	

4.1.3.5 Support capacity building and promote the development of reinvigorated and compatible DSS's in all basin countries TD-RFDMC

BDS Output 4.1.4: Integrated basin-wide flood and drought forecasting and early warning

MRC SP Deliverables

- ◆ Reports on flood and drought monitoring and forecasting (as needed; annual)
- ◆ Design report for improved flood and drought forecasting and early warning with longer forecast and outlook, including data requirements (2021)
- ◆ Data sharing agreements to enhance flood and drought forecasting between MRCS and MCs (2022)

MRC SP Activities	Lead	Related to Outputs
4.1.4.1 Develop an improved and integrated regional system for basin-wide flood and drought forecasting and early warning (extension to monthly forecast, three to six monthly and seasonal outlook, and considering local knowledge and information and communication needs related gender and vulnerability)	TD-RFDMC NIPs	
4.1.4.2 Implement improved and integrated flood and drought forecasting and early warning information to basin countries through compatible DSS's, enhanced exchange of data, consolidated water monitoring networks, and agreed communication protocols	TD-RFDMC	
4.1.4.3 Implement flash flood guidance to basin countries through reinvigorated and compatible DSS's, enhanced exchange of data, consolidated water monitoring networks, and agreed communication protocols	TD-RFDMC	

BDS Output 4.1.5: Joint State of Basin Report

MRC SP Deliverables

- ◆ Memorandums of Understanding or Work Agreements for implementation of the DAGAP (2021)
- ◆ State of Basin Report identifying effectiveness of progress with BDS implementation (2023)

MRC SP Activities	Lead	Related to Outputs
4.1.5.1 Implement the MRB-IF and Data Acquisition and Generation Action Plan to enable preparation of the 2023 State of Basin Report with improved consistency and alignment of basin-wide datasets	ED NIPs	Outputs 4.1.1, 4.1.2, 4.1.3
4.1.5.2 Prepare the 2023 State of Basin Report with all six basin countries as a mid-implementation report on the BDS 2021–2030	ED NIPs	

The implementation of the activities under Output 4.1.1 can best be implemented by a company (or consortium of companies) that has the capacity and experience to inventory, consolidate, align, and (re)design the many water-related monitoring networks in the basin for future national and regional planning and management purposes. This company

will also support the design and development of the core water-related monitoring network for the mainstream.

The ongoing reinvigoration of the MRC's data, information, modelling and communication systems (Outputs 4.1.2 and 4.1.3) will be supported by the company/consortium which will be engaged for supporting the proactive regional planning activities under Outcome 3.1. It is expected that this company will support the development of a contemporary DSS (DSF for MRC) for planning and management across spatial and time scales, which is connected to global, satellite and ground data, and has a web interface that makes data and information available to stakeholders in the basin, providing opportunities to comment and participate in formulation and assessment of basin-wide alternative development scenarios. As identified in the table above, some of the activities under this Outcome will need to be incorporated into National Indicative Plans (NIPs) for the Outcome and Outputs to be achieved.

BDS Outcome 4.2: Better disaster management and adaptation to water resources development and climate risks

To help achieve Outcome 4.2, the MRC will focus on supporting cooperation between basin countries on coordinated water infrastructure operations, floodwater management, and climate change adaptation. The activities identified are central to the sustainable development, utilisation, management and conservation of the water and related resources of the Mekong River Basin under Article 1 of the *1995 Mekong Agreement*, and involve the MRC undertaking monitoring (CRBMF1), assessment (CRBMF2) and planning (CRBMF3) core functions. However, the Outcome can only be achieved with the substantial contribution of Outputs from other dimensions, in particular the identification and assessment of significant joint investment projects and national projects of basin-wide significance under Outputs 3.1.1 and 5.1.2 that have the capacity to influence water availability and flow conditions.

For coordinated water infrastructure operations, work will continue on reviewing existing dam operating rules and identifying opportunities for improvements. This is an essential input to the development of cooperation mechanisms for data and information exchange, not only between operators (within and between countries), but also to each basin country and community potentially affected by changes in river levels. Cooperation mechanisms for the exchange of data and information will need to reflect all relevant issues associated with potential transboundary impacts including coordinated sediment flushing in conjunction with the sediment management plan under Output 1.2.1, the provision of environmental flows in support of water quality, fish and connected wetlands under Outputs 1.1.1 and 1.3.1, dam safety issues and emergency releases in conjunction with Output 4.2.1 (including to help inform consideration of issues under Articles 8 and 10 of the *1995 Mekong Agreement*), and helping to mitigate and manage floods and droughts.

Effective implementation of cooperation mechanisms for data and information sharing for water infrastructure are highly dependent on improved data and information systems under Output 4.1.2 and reinvigorated Decision Support Systems under Output 4.1.3.

In relation to climate change adaptation, the MRC will continue to support Member Countries on the implementation of the Mekong Adaptation Strategy and Action Plan (MASAP), and the basin-wide Drought Management Strategy (DMS). This includes helping countries identify opportunities to modify water-related sector development and management plans to better respond to climate change threats.

Strategic directions for integrated flood and drought management will be informed by scenario assessment work under Output 3.1.1. The focus is on flood and drought because these are the key ways in which regional water resources management will be affected by climate change and is an area of comparative advantage for the MRC. However, improved regional climate monitoring through the implementation of the MRB-IF and DAGAP, data and information systems and the DSF under Outcome 4.1 will also support countries to identify and respond to other climate risks (e.g. in relation to extreme heat and outside workers) through relevant sector strategies under activity 4.2.2.1

Climate Change adaptation will also be improved by the MRC working with countries on the uptake of the drought management guidelines and by coordinating access to international climate change finance in support of regional adaptation needs. This may involve the MRC becoming an accredited entity under one or more international climate funds, which would help the MRC improve its management systems and operations under Output 5.1.2 and also help direct financing to the highest regional adaptation priorities.

Strategic Priority 4: Strengthen resilience against climate risks, extreme floods and droughts		
BDS Outcome 4.2: Better disaster management and adaptation to water resources development and climate risks		
Output 4.2.1: Coordinated water infrastructure operations for multiple benefits including gender and vulnerability sensitive disaster mitigation and management		
MRC SP Deliverables		
<ul style="list-style-type: none">◆ Report on experiences and opportunities for coordinated operating rules and cooperation arrangements on dam operations (2021)◆ Cooperation mechanisms for data and information sharing for existing dams (2022)◆ Information sharing and communication mechanisms for water-related emergencies (2022)◆ Cooperation mechanisms for data and information sharing for existing and newly identified dams and other water infrastructure (2024)		
MRC SP Activities	Lead	Related to Outputs

4.2.1.1 Continue review of existing dam operating rules and cooperation arrangements and experiences, and identify opportunities for coordinated flow management to increase efficiency, reduce impacts and help mitigate floods and droughts	PD	
4.2.1.2 Develop and implement cooperation mechanisms for data and information sharing for <i>existing</i> dam operations (linked to JAPs) to optimise regional benefits and minimise regional costs	PD NIPs	
4.2.1.3 Develop and implement cooperation mechanisms for data and information sharing for <i>new</i> dams and other water infrastructure to optimise regional benefits and minimise regional costs	PD NIPs	
4.2.1.4 Develop and implement information sharing and communication mechanisms (including consideration of gender and vulnerability) for water-related emergencies including water quality, navigation and dam safety	PD, ED and OCEO NIPs	
BDS Output 4.2.2: Climate change adaptation, flood and drought management mainstreamed at national levels		
MRC SP Deliverables		
<ul style="list-style-type: none"> ◆ Accreditation of MRC under international climate funds (2022) ◆ Technical report and guidance on mainstreaming of climate change adaptation to increased floods and droughts into regional and national strategies, plans and projects (2024) ◆ Evaluation reports on implementation of transboundary projects to facilitate regional cooperation on climate change and water resources management (2022) 		
MRC SP Activities	Lead	Related to Outputs
4.2.2.1 Support mainstreaming of climate change adaptation to increased climate risks, floods and droughts into regional and national strategies, plans and projects	PD and TD- RFDMC NIPs	Outputs 2.1.2, 2.1.4, 2.2.1, 3.2.1, 3.2.5, 4.2.1, 4.2.2
4.2.2.2 Coordinate enhanced access to international climate finance through climate fund accreditation for the MRC	PD and OCEO	Outputs 1.3.2, 3.2.4
4.2.2.3 Support implementation of the Drought Management Strategy including by finalising and implementing the drought adaptation guidelines	TD-RFDMC NIPs	
4.2.2.4 Support implementation of agreed strategic directions to manage existing, future and residual flood risks in the LMB	TD-RFDMC	Output 3.1.1
4.2.2.5 Further identify and facilitate implementation of transboundary projects on climate change adaptation and water resources management (including pilot projects to improve knowledge, management, systems and cooperation in response to increased floods and droughts)	PD NIPs	Outputs 3.1.1, 5.2.2

The activities under Outcome 4.1 are designed to help reduce floods and droughts through coordinated floodwater management, dam operations and climate change adaptation.

The activities can be implemented through the usual MRC delivery model which uses individual consultants, as needed, to support the work of the expert groups. Most of the activities will be informed by the proactive regional planning activities under Outcome 3.1 and implementation requires coordination or cooperation with MLC Water and/or ASEAN to create synergies and added value from taking a basin-wide approach and avoiding duplication. The updating of the flood and drought management and mitigation strategy will be carried out towards the end of this SP period as it will be informed by the results of proactive regional planning activities under Outcome 3.1 and on agreed joint investment projects and national projects of basin-wide significance under Outcome 5.2.

As identified in the table above, some of the activities under this Outcome will need to be incorporated into National Indicative Plans (NIPs) for the Outcome and Outputs to be achieved. Indeed, often the majority of the work is required at the national level, for example in relation to mainstreaming climate change into national strategies, plans and projects, and this will need to be appropriately incorporated and budgeted for in the NIPs.

8.6 Strategic Priority 5: Strengthen cooperation among all basin countries and stakeholders

Under this strategic priority, the BDS identifies and describes 2 Outcomes and 7 Outputs (see Sections 5.4 and 5.5). The tables below summarize the key deliverables (and timelines) and activities that will be implemented by the MRC to contribute to these Outcomes and Outputs. For the preparation of work plans, the activities under each Output can be further broken down into tasks, including the enabling tasks related to the impact pathway and the necessary stakeholder engagement and capacity building to ensure uptake (Section 8.1).

BDS Outcome 5.1: Strengthened Mekong River Commission for more effective implementation of the Mekong Agreement

To help achieve Outcome 5.1, the MRC will focus on strengthening the implementation of the *1995 Mekong Agreement Procedures* (aka MRC Procedures), including in relation to Article 7 and Article 8, and on the development of organisational capacity encompassing all its regional and national parts. The activities identified involve the MRC undertaking its MRC Procedures (CRBMF5) and Corporate Services (CF1) core functions.

To strengthen the implementation of the MRC Procedures requires synthesising the lessons learned from their implementation and emerging work to-date and through a consultative process, developing a proposal for their improvement (of all Procedures) to

be put to Member Countries. Once a proposal is agreed, the MRC will update relevant technical guidelines and coordinate their implementation. The focus under this Outcome is on the enhanced implementation of the *Procedures for Notification, Prior Consultation and Agreement* (PNPCA) and the *Procedures for Data and Information Exchange and Sharing* (PDIES), as the updating of PMFM, PWQ, PWUM are addressed under Outcome 1.1. If following review, no updates to technical guidelines are considered necessary, the activities under Output 5.1.1 will involve continued implementation of the current technical guidelines as they stand.

The organisational development of the MRC requires the MRC develop a plan for that purpose that addresses the capability gaps and needs across all MRC bodies. This includes the Council, Joint Committee (JC), the MRC Secretariat and the RFDMC, the National Mekong Committees (NMCs) and the National Mekong Committee Secretariats (NMCSS) and the members of expert groups from line/implementing agencies in each country. The Plan needs to take account of the trajectory of resource and budget availability to 2030 and the increasing role of agencies in Member Countries in undertaking regional activities of the MRC. Once agreed, the MRC will coordinate the implementation of the plan.

Various activities to strengthen the current capabilities of the MRC have already been identified through previous reviews including the Mid-Term Review of the 2016–2020 Strategic Plan and the 2018 Operational Review and include measures to institutionalise the uptake of regional products and services at the national level, enhanced secondment activities, implementation of revised administrative and financial manuals, enhanced internal audit controls and so on. Routine management, governance, monitoring, evaluation and reporting functions will continue to be carried out.

Strategic Priority 5: Strengthen cooperation among all countries and stakeholders

BDS Outcome 5.1: Strengthened Mekong River Commission for more effective implementation of the Mekong Agreement

BDS Output 5.1.1: Implementation of the MRC Procedures enhanced

MRC SP Deliverables

- ◆ JC Statement and Joint Action Plan for mainstream projects (as needed)
- ◆ Comprehensive Technical Proposal for enhanced implementation of MRC Procedures (2022)
- ◆ Updated technical guidelines for PNPCA (2023)
- ◆ Updated technical guidelines for PDIES (2023)

MRC SP Activities	Lead	Related to Outputs
5.1.1.1 Review and improve the implementation of all MRC Procedures (PDIES, PNPCA, PMFM, PWQ, PWUM), including by synthesising evaluation results and lessons learned from emerging work on their implementation, through the Joint Platform	PD	
5.1.1.2 Based on the agreed proposal, improve the Technical Guidelines (TG) for implementing the PNPCA	PD	
5.1.1.3 Based on the agreed proposal and the implementation experience of MRB-IF and DAGAP, improve the Technical Guidelines (TG) for implementing the PDIES	TD- RFDMC and ED	
5.1.1.4 Implement the PNPCA taking into account the updated TG and related technical guidelines for other Procedures	PD NIPs	
5.1.1.5 Implement the PDIES through the MRB-IF and DAGAP, taking into account the updated TG and related technical guidelines for other Procedures	TD- RFDMC and ED	

BDS Output 5.1.2: Organisational development of the Mekong River Commission

MRC SP Deliverables

- ◆ National Indicative Plans (2021)
- ◆ Organisational development plan for the MRC towards 2030, including Council, JC, MRCS (and RFDMC), NMCs, NMCSs and expert groups (2022)
- ◆ Multi-year work plans (2021-22, 2022-23, 2023-24, 2024-25)
- ◆ Enhanced monitoring, evaluation and reporting system of MRC SP, NIPs and other related projects/activities (2021)
- ◆ MRC Annual Reports (annual)
- ◆ Fourth MRC Summit (2022)
- ◆ Mid-Term Review of the MRC Strategic Plan (2023)
- ◆ MRC Strategic Plan 2026-2030 (2025)

MRC SP Activities	Lead	Related to Outputs
5.1.2.1 Prepare and implement an organisational development plan for the MRC towards 2030 (including the Council, JC, MRCS (and RFDMC), NMCs, NMCSs and Expert Groups) based on agreed vision of future capacity, diversity and gender, revised ROPs, organisational structure, function, and personnel, and operating arrangements	OCEO	
5.1.2.2 Coordinate and build capacity for national implementation of decentralised CRBMFs to achieve regional objectives, planning and management including through joint basin expert groups and guidance on integrating regional work into national ToRs and job descriptions	OCEO	
5.1.2.3 Institutionalize 'uptake of Outputs' as part of the development and implementation process for all MRC products and services based on the Uptake Guidelines	OCEO	
5.1.2.4 Establish a staff secondment programme between regional level and national implementing agency levels (all 6 countries) building on the Junior Riparian Professional Programme	AD NIPs	
5.1.2.5 Manage human resources and procurement in-line with HR and Procurement Manuals and the Fraud Prevention and Anti-Corruption (FPAC) Mechanism	AD	
5.1.2.6 Operate the new financial management information system in line with Finance Manual and FPAC, and in support of work planning, budget monitoring and reporting	AD	
5.1.2.7 Enhance internal controls, including operationalisation of the Audit Committee and Internal Auditor	AD	
5.1.2.8 Organise and coordinate MRC governance meetings including 2022 Summit, Council, Joint Committee, Joint Committee Task Force, and Budget Committee, including participation of MRC partners	AD and OCEO	
5.1.2.9 Prepare the multi-year work plans to implement the MRC SP	OCEO	

5.1.2.10 Support the preparation and implementation of the National Indicative Plans to implement the BDS 2021–2030 and MRC SP 2021–2025 and 2026–2030	PD and OCEO NIPs
5.1.2.11 Prepare the MRC SP 2026–2030 to implement the remaining five years of the BDS 2021–2030	OCEO
5.1.2.12 Monitor, evaluate and report on the implementation of the MRC SP, NIPs and the contribution of water-related activities (projects and programmes) of Mekong-related regional cooperation mechanisms to the BDS	OCEO

The implementation of Output 5.1.1 will be led by a senior staff or expert with a deep understanding of how all the Procedures should support and facilitate development and management planning in the Mekong River Basin (and thus the implementation of the BDS). When this relationship is not clear or when basin planning and the development/implementation of the Procedures are ‘out of sync’, the Procedures may be seen as restraining and/or ineffective mechanisms that dis-benefit national interests.

For the implementation of the organisational and institutional activities under Output 5.1.2 it will be important to use experts and consultants that have been involved in a leading role in similar activities for similar organizations elsewhere within or outside the region. Many of the activities will need to be complemented with capacity building of the relevant national line/implementing agencies by regional MRC bodies (i.e. this is not only about strengthening the MRC Secretariat). As identified in the table above, some of the activities under this Outcome will need to be incorporated into National Indicative Plans (NIPs) for the Outcome and Outputs to be achieved.

Outcome 5.2: Increased joint efforts and partnerships for more integrated management of the entire river basin

To help achieve Outcome 5.2, the MRC will work with all its partners and other stakeholders through several avenues designed to move the management of the entire river system to a more integrated, coherent state. The activities identified primarily involve the MRC undertaking its planning (CRBMF3) and corporate services (CF1) core functions by fulfilling the request of leaders to *coordinate the work on water and related resources development and management of relevant actors* in the Mekong.

Coordinating the work of a range of actors, including the new water cooperation platform, MLC Water, means first establishing how basin countries see future management arrangements unfolding, mapping-out who is best placed to do what, and how interaction between the various mechanisms would most usefully occur given the evolving basin conditions. The MRC’s role involves acting as a facilitator of these discussions by

identifying and assessing different options for future institutional arrangements through a consultative process with relevant actors. Where common understanding is reached among basin countries, the MRC would then work with others (especially MLC Water) to implement the preferred options.

To achieve higher benefits and lower costs from water resources development and management, the MRC will undertake its water diplomacy functions to facilitate discussion and agreement among basin countries on proposed joint investment projects and national projects of basin-wide significance including consideration of trade-offs and benefit sharing. This support will be provided principally by mobilising technical expertise, providing a forum for basin country negotiation (including with developers, as appropriate), and preparing material to inform participants of options and their implications.

To help achieve the integrated management of the entire river basin, the MRC will work with its Member Countries and dialogue partners (China and Myanmar), MLC Water and other regional cooperation mechanisms (ASEAN, GMS, ACMECS, MUSP, Mekong-Japan and Mekong-ROK) to encourage a common focus on achieving the Outcomes and Outputs of the BDS 2021–2030. This will include revisiting relevant partnership agreements to identify and support complementary actions based on relative strength, and aligning fund raising efforts including by exploring the potential to establish a Mekong Fund (see Section 6.5). The MRC would mobilise expertise to design and evaluate options for such a fund for discussion with basin countries, development partners and other relevant stakeholders.

Two key institutional mechanisms the MRC will pursue to support the integrated management of the entire river system are: (i) strengthening MRC expert groups with relevant expertise from all basin countries including the Dialogue Partners and the LMC Water Center; and (ii) the establishment and operation of a multiple stakeholder platform that covers interests and relevant groups across all basin countries. The MRC would work with MLC Water and other partners to establish and operate these mechanisms, including to develop guidelines on the participation of civil society organisations and others.

While joint basin expert groups would be established for four overarching areas of cooperation, these groups may decide to establish technical sub-groups on specific matters of interest, for example on energy, fisheries, navigation, data and monitoring, etc.

Strategic Priority 5: Strengthen cooperation among all countries and stakeholders

BDS Outcome 5.2: Increased joint efforts and partnerships for more integrated management of the entire river basin

BDS Output 5.2.1: Common understanding on the potential future institutional arrangements for entire basin management

MRC SP Deliverables

- ◆ Evaluation report of institutional options for managing the Mekong River Basin by 2030, including synergies, overlaps, and recommendations (2022)
- ◆ Institutional development and cooperation action plan for the management of the Mekong River Basin (2023)

MRC SP Activities	Lead	Related to Outputs
5.2.1.1 Further clarify mandates, areas of common interests, and comparative advantages in the changing basin context for Mekong related regional cooperation mechanisms and frameworks	OCEO	Output 5.1.2
5.2.1.2 Explore and evaluate in a participatory manner the institutional options for managing the Mekong River Basin by 2030	OCEO	

BDS Output 5.2.2: Significant joint investment projects and national projects of basin-wide significance and associated measures agreed based on consideration of trade-offs, benefit sharing and risks

MRC SP Deliverables

- ◆ High-level Discussion paper on proposed joint investment projects and national projects of basin-wide significance with options for cost and benefit sharing based on results of proactive planning (2024)
- ◆ Comprehensive concept/project information notes for agreed significant joint investment projects (2024-2025)

MRC SP Activities	Lead	Related to Outputs
5.2.2.1 Facilitate consideration of proposed joint investment projects and measures and national projects of basin-wide significance including trade-off and benefit sharing discussions, and the comparison with benefits and costs of existing national water related development plans	OCEO	
5.2.2.2 Support the preparation of agreed significant joint investment projects and national projects of basin-wide significance	PD	Based on the results of 3.1.1

BDS Output 5.2.3 Mekong water-related cooperation mechanisms and relevant partnerships implemented in collaboration with countries

MRC SP Deliverables

- ◆ Partnership agreements with ASEAN, GMS, MLC Water, ACMECS, Mekong-US, Mekong-Japan, Mekong-ROK implemented (annual)
- ◆ Partnership agreements with all relevant partners developed and implemented (annual)
- ◆ Year-round data sharing on river flows and dam operations between all basin countries (2022)
- ◆ Policy paper on options for a Mekong Fund mechanism through multiple partnerships and financing sources for the benefit of environmental assets and vulnerable social groups (2021)

MRC SP Activities	Lead	Related to Outputs
5.2.3.1 Implement and enhance partnerships between MRC and Dialogue Partners as well as the Mekong-Lancang Cooperation on Water, including agreements for year-round data sharing on river flows and dam operations	OCEO	Output 4.2.2
5.2.3.2 Implement and enhance partnerships between MRC and other Mekong water-related programmes of regional cooperation mechanisms (including ASEAN, GMS, ACMECS, Mekong-US, Mekong-Japan and Mekong-ROK)	OCEO	
5.2.3.3 Implement and enhance partnerships towards BDS Strategic Priorities between MRC and all other relevant partners, including development partners, international organisations, RBOs, research institutes and universities, non-governmental organisations and the private sector	OCEO	
5.2.3.4 Explore the options for establishing a Mekong Fund through multiple partnerships and financing sources for the benefit of environmental assets, disaster response and vulnerable social groups	PD, ED and OCEO	Outputs 2.2.1

BDS Output 5.2.4: Joint Basin Expert Groups

MRC SP Deliverables

- ◆ Proposal for the establishment and operation of Joint Basin Expert Groups agreed by all six basin countries (2022)
- ◆ Updated plan for mobilising national implementing agencies to increasingly implement basin planning and management (2023)

MRC SP Activities	Lead	Related to Outputs
5.2.4.1 Strengthen MRC Expert Groups with representatives from all six basin countries by deepening their technical cooperation and engagement under the MRC Dialogue Partnership and in cooperation with the LMC Water Center	OCEO	Outputs 5.1.1, 5.2.4
5.2.4.2 Coordinate and support the operations of the Expert Groups	OCEO	

BDS Output 5.2.5: Harmonised basin-wide stakeholder platform**MRC SP Deliverables**

- ◆ Feasibility and design report of the Multiple Stakeholder Platform (2023)
- ◆ Stakeholder input on BDS implementation (annual)
- ◆ Stakeholder engagement reports and communication products (as needed)

MRC SP Activities	Lead	Related to Outputs
5.2.5.1 Develop a Multiple Stakeholder Platform for the whole basin with countries and MLC Water and in consultation with all other relevant partners (to consolidate and align) including clear objectives and guidelines on participation and contribution	OCEO	
5.2.5.2 Coordinate the management and operations of the Multiple Stakeholder Platform (including the regional stakeholder forum) including consistent recording, reporting and impact tracking procedures in response to stakeholder input	OCEO	
5.2.5.3 Implement proactive engagement and communication with stakeholders, the media, and the public	OCEO	

This future basin management options assessment will be carried out in the beginning of this SP period to provide direction to MRC's organisational development plan (Output 5.1.2) and to the focus of cooperation with other regional cooperation mechanisms. The assessment will be implemented in consultation with the technical leaders of the two regional water cooperation platforms (MRC and MLC Water), drawing on relevant international experience. The facilitation of agreement to significant joint investment projects and national projects of basin-wide significance and associated measures, including to help mitigate floods and droughts, will be informed by the proactive regional planning under Outcome 3.1. Key deliverables in relation to project preparation are expected in the next MRC SP period.

The implementation of most of the other activities under Outcome 5.2 requires consultation with MLC Water, which may lead to joint or coordinated implementation of the activity (as well as other SP Outputs and activities that figure in the list of proposed projects under MLC Water). In case of joint implementation, the resources and implementation modalities will be jointly agreed. Some of the activities can be implemented through the usual MRC delivery model which uses (individual) consultants, as needed. As identified in the table above, some of the activities under this Outcome will need to be incorporated into National Indicative Plans (NIPs) for the Outcome and Outputs to be achieved.

8.7 Supporting COVID-19 recovery

The socio-economic impact of responses to the new coronavirus (COVID-19) will be severe (see Section 4.5 on risks and challenges). The water sector has an important role to play in the recovery from and adaption to COVID-19 and for suppression and prevention of similar diseases through the provision of safe water, sanitation, and hygienic conditions (WASH) and measures that strengthen water security.³⁰ In addition to ensuring sustainable access to adequate quantity and quality of water, medium term measures such as watershed restoration, nature-based (infrastructure) solutions, and water resources management will help avoid some of the economic and human costs associated with future epidemics and pandemics.

More sustainable management of watersheds and other environmental assets where the transfer of new viruses from animal to human host is most likely to originate, is critical to risk mitigation for future disease outbreaks. In fact, civil society organizations have stated that “the COVID-19 pandemic has highlighted the importance of the Mekong’s farmlands, forests, rivers, wetlands and fisheries as a safety net during times of crisis. Local people’s continued access to rivers and natural resources are critical to ensuring a more healthy and equitable recovery from the pandemic.”³¹

This BDS/MRCSP supports the recovery from COVID-19 and builds resilience of communities for possible similar disease outbreaks in future through measures supporting economic recovery, strengthening water security, improving food security, enhancing regional cooperation and trust, supporting vulnerable populations, and mitigating the risk of future novel zoonotic virus outbreaks, as described in Table 9.1 below. A large proportion of the MRC SP activities budget (USD 15 M) are directly related to recovery, suppression and prevention of epidemics and pandemics such as COVID-19. The implementation of these activities offers opportunities for new thinking and the reinvigoration of a more cooperative, inclusive, sustainable development.

30 UN Water define water security as “The capacity of a population to safeguard sustainable access to adequate quantities of and acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters (severe floods and droughts), and for preserving ecosystems in a climate of peace and political stability”

31 Save the Mekong Coalition, Statement, 11 May 2020.

Table 8.1: MRC SP activities in support of recovery from COVID-19 and building resilience for possible similar disease outbreaks in future

Responding, preventing and suppressing epidemics and pandemics		Selected MRC SP activities (short descriptions)
Key Focal areas	General interventions	
Economic recovery Challenge is to accelerate inclusive growth. Opportunity for increased investments in sustainable development and spurring the transition towards a low-carbon economy	Renewable energy development Modernizing agriculture Improving food and agricultural value chains Improving navigation Watershed restoration Green infrastructure development	3.2.2.1 Support implementation of the SHDS and coordinate alignment with regional energy plans 3.2.2.2 Assess alternative energy/water system integration options 3.2.3.1 Support implementation of the Navigation Master Plan i 3.2.4.1 Support investments in wetlands and watersheds 3.2.5.1 Support investments in fisheries consistent with the BFMS
Water security Essential for preventing and combatting public health impacts of future epidemics and pandemics. Measures such as handwashing assume that communities have sustainable access to sufficient amounts of adequate quality water	Improvement of water availability Improvement of water quality Water resources management Increasing access to WASH Reduction of flood and drought risks Building resilience to climate change	1.1.1.1 Identify new implementable flow thresholds for PMFM 1.1.1.4 Implement the PWQ including new methods and parameters (e.g. for plastic pollution) 4.2.1.2/3 Develop and implement data and information sharing mechanisms for dams and other infrastructure 4.2.1.4 Implement info sharing and communication mechanisms for water-related emergencies 4.1.4.1 Develop improved flood and drought forecasting 4.1.4.3 Implement flash flood guidance to basin countries

<p>Food security</p> <p>The viability of agriculture is fundamental to preserve livelihoods in rural areas, contain price spikes for staple foods, and limit food import bills when foreign exchange is scarce</p>	<p>Improvement of (irrigated) agriculture</p> <p>Management of capture fisheries</p> <p>Improvement of aquaculture</p>	<p>2.1.2.3 Support transboundary fisheries management projects</p> <p>3.2.5.2 Explore alternative futures for fish populations and catch composition</p> <p>3.2.1.2 Promote and provide guidance to irrigation development and management</p> <p>2.1.3.1 Evaluate effectiveness of fish passages (including by working with developers)</p> <p>4.2.2.3 Support implementation of the Drought Management Strategy</p>
<p>Regional cooperation and trust</p> <p>Essential for optimal and peaceful sustainable development, creating synergies between economic sectors in the region and within river basins, and building and maintaining trust among countries so they cooperate on responding to pandemics and disasters</p>	<p>Joint investment projects</p> <p>Trade</p> <p>Joint institutions</p>	<p>3.1.1.2 Formulate development scenarios with alternative development options and update assessment methodology</p> <p>3.1.1.3 Initial assessment of agreed (alternative) scenarios</p> <p>5.2.2.1 Facilitate consideration of proposed joint projects and measures</p> <p>4.1.1.1 Assess, redesign and develop core river monitoring network</p> <p>4.1.3.1 Further study region's DSS's and plan a system of compatible DSS's with the MRC DSF</p> <p>5.1.1.4 Implement the PNPCA</p> <p>5.1.2.1 Implement an organisational development plan for the MRC towards 2030</p> <p>5.1.2.8 Implement MRC governance and dialogue meetings</p> <p>5.2.1.2 Evaluate institutional options for managing the Mekong River Basin by 2030</p> <p>5.2.5.1 Develop a Multiple Stakeholder Platform with Member Countries and MLC Water</p>

<p>Support for vulnerable populations</p> <p>It is likely that poorer segments of the population will be hardest hit, including woman and marginalized groups. Response and resilience building measures need to ensure that barriers faced by these groups are tackled in interventions</p>	<p>Immediate WASH responses, followed by Interventions to strengthen water and food security and economic growth (see above) while Taking a ‘gender and vulnerability’ approach to account for intersectional inequity and the different dimensions of vulnerability</p>	<p>2.1.1 Access and supply of safe water to people in vulnerable situations improved (Output BDS)</p> <p>2.1.4.1 Review and analysis of multiple aspects of vulnerability including Indigenous and minority ethnic groups, gender equality and child labour, and including data requirement</p> <p>2.1.4.2 Enhance gender and vulnerability disaggregated data collection within DAGAP</p> <p>2.1.4.3 Analyze and recommend measures to improve equity for vulnerable groups</p> <p>1.3.1.2 Support updating and implementation of management plans for prioritized key assets</p>
<p>Mitigating the risk of future novel zoonotic virus outbreaks</p> <p>The increasing habitat fragmentation, resource competition, and resort to wildlife hunting and consumption for food seems to facilitate the movement of viruses between species and to humans</p>	<p>More sustainable watershed management that protects contiguous habitat and reduces unnecessary animal-human contact</p> <p>Improving food security so that vulnerable populations are less reliant on bush meat and wild animal harvest</p>	<p>1.3.2.1 Identify good practices for watershed management and build capacity</p> <p>1.3.2.2 Develop a basin-wide planning and management framework for key watersheds</p> <p>[in addition to those activities above focused on improving food security and supporting vulnerable populations]</p>





IMPLEMENTATION OF THE MRC SP

This Chapter describes the MRC's institutional arrangements for implementing the MRC SP, the roles of the MRC's key stakeholders in the implementation of the Plan, the multi-year work planning for implementation of the activity chains in Chapter 8, and the financial and human resource requirements and arrangements for the Plan. It also describes how key risks to Plan will be managed and how the Plan implementation will be monitored and evaluated.

9.1 Institutional arrangements for MRC SP implementation

A results-based mutual accountability process. The MRC at regional and national levels is committed to implement the activities in Chapter 8 and contribute to the delivery of the related BDS Outputs over the next 5 years. A key focal area that needs to be managed during implementation is the continuing and gradual transition of MRC towards a leaner, 'expert' organization funded by the Member Countries. This process will be supported through implementing an organisational development plan (Output 5.1.2) to:

1. **Support increasing national implementation** of CRBMFs and the transition towards regional planning and management processes that are integrated in national planning and governance systems by 2030;
2. **Strengthen the MRC** to enable increased cooperation with MLC Water for the purposes of integrated management of the whole Mekong River system by 2030, ensuring the adequate sharing of data and information, joint studies and assessments, an integrated whole-of-basin monitoring network, and common state of basin reporting and BDS.

A key mechanism in this transition process is the enhancement of the existing MRC expert groups to joint basin expert groups with technical leaders from key national line/ implementing agencies of all 6 basin countries (see Section 6.2). These groups will steer, oversee and increasingly implement (through their agencies) regional planning and management functions with coordination and facilitation of the MRCS at the regional level and NMCSs at the national level. The joint basin expert groups will gradually take over many activities that are currently dependent on consultants and the financial support of development partners.

Institutional development. To achieve this higher degree of national implementation by 2030, institutional mechanisms, technical processes, and tools and capacity need to

be developed in the national line/implementing agencies and the NMCSs. The required institutional strengthening, decentralization and cooperation processes are fully incorporated into the activity chains for Strategic Priority 5: Strengthen cooperation among all countries and stakeholders (Section 8.6). In this process, the MRC structure, governance and operations will change to address identified constraints and adapt to the changing institutional landscape. The following provides a summary of the (changing) roles and responsibilities for MRC SP implementation of the bodies that make up the MRC governance structure (Figure 9.1).

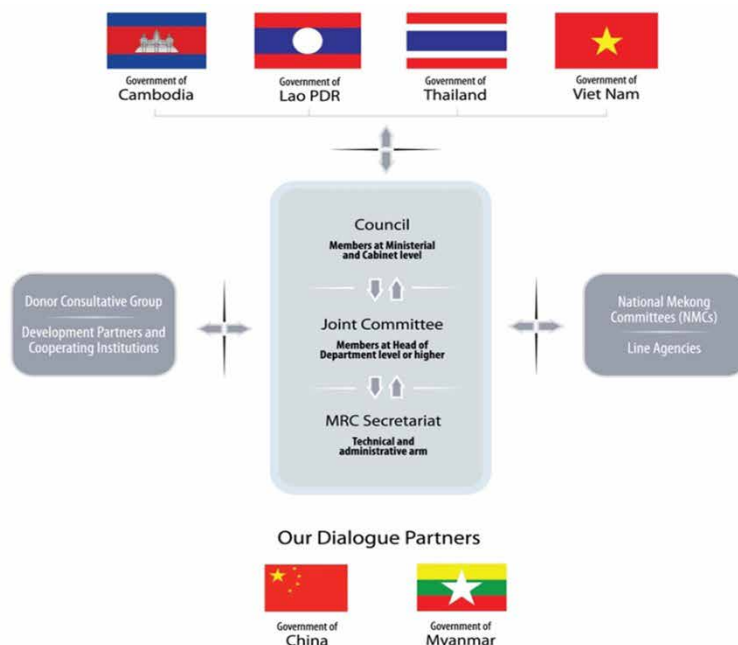


Figure 9.1. MRC Governance Structure

Summit of Heads of Government

The four-yearly MRC Summit of Heads of Government, first organised in 2010, is the highest political forum of the MRC whereby outcomes of cooperation are assessed, and directions set for the following four years. The fourth Summit in 2022 – towards the mid-point in the implementation of this MRC SP – is an important milestone for the MRC to assess the direction of its development.

Council of Ministers

As the highest decision-making body in the MRC, the Council approves the MRC SP and makes decisions on all policy-related matters concerning its implementation, including organisational policies, basin-wide strategies and plans, strategic cooperation partnerships, and resolution of differences. The Council provides strategic guidance on priority setting, including by approving the multi-year work plans (including annual budgets) based on endorsement from the Joint Committee and the recommendation of the Budget Committee.

In what is a critical transition phase for MRC in a changing institutional landscape, the Council also oversees high-level risks relating to the implementation of the BDS, including national uptake of regional Outputs, and the organisational development of the MRC, including the transition to national implementation of CRBMFs and increasing cooperation with MLC Water for the purposes of integrated management of the whole Mekong River system. It helps in this regard that the MRC Council members are the same ministers for four LMB countries providing policy direction in Ministerial Meetings of MLC Water.

Joint Committee

In coordinating the implementation of the Council's decisions, the Joint Committee (JC) steers the implementation of this MRC SP. This role includes technical priority setting and guidance on delivery of activities as well as reviewing and endorsing policy-related resolutions for submission to the Council for approval. The Joint Committee provides guidance on the preparation of the multi-year work plans, including the definition of activities and allocation of annual budgets.

The Joint Committee establishes and is assisted in its work by task forces, working groups, expert groups or similar arrangements that provide technical input and advice on certain institutional, technical and policy related issues. As senior officials in their respective countries, Joint Committee members also have extensive networks which need to be mobilised to advance the MRC's aims with respect to engagement with external stakeholders. The CEO works closely with Committee members in this regard. Most of the JC members are also members of the Joint Working Group (JWG), which is the coordination and decision-making body of MLC Water.

National Mekong Committees of line/implementing agencies

In each Member Country, line or implementing agencies in water and related sectors, as well as those agencies relevant to Mekong cooperation (such as planning and investment and foreign affairs), are members of a National Mekong Committee (NMC), supported

by a Secretariat (NMCS) which performs cross-sectoral, cross-agency coordination, communication and reporting. The NMCSs are attached to the ministry responsible for water resources management and/or environmental management.

Each NMC provides policy advice and technical information to enable regional decision-making in the interest of the respective country with due consideration of opportunities arising from BDS/MRC SP implementation. Each committee advises the Council Member and Government on national interest for regional consensus building and help ensure that regional decisions are implemented by concerned sectors, including the uptake of existing and new regional Outputs. Each NMC secretariat fulfils its coordination function for Mekong cooperation and is an advocate of transboundary cooperation and IWRM in each country.

With the ongoing transition towards national implementation of CRBMFs, including regional planning and basin management, the NMC's will need to facilitate and oversee basin activities to ensure they are integrated in the annual work plans and budgets of relevant national line/implementing agencies. This will enable the joint basin expert groups and their working groups (with representatives of the line/implementing agencies) to implement basin activities with their agencies. The NMCSs/MRCS will coordinate the preparation and implementation of the work plans of the expert groups to ensure proper basin-wide synergy and to monitor and assess performance. This transition process will improve communication and decision-making between MRCS, JC, NMCSs and line/implementing agencies, and further contribute to **integration of regional and national planning**.

MRC Secretariat (MRCS)

The MRCS is the operational arm of the MRC and performs technical, facilitating and administrative functions under the management of a Chief Executive Officer (CEO). It facilitates regional meetings of the Member Countries and provides technical advice on joint planning, coordination and cooperation. It also works closely with the four countries' coordinating bodies, the NMCs, partners and stakeholders.

The MRCS undertakes many of the MRC SP activities in cooperation with national counterparts and others. Each of the Secretariat's divisions and office will lead implementation of specific activities with the contribution of other divisions identified in delivery plans. All divisions will be accountable not only for their lead deliverables but also for their agreed contribution to activities led by other divisions. These arrangements will be further developed in multi-year work plans.

Change of MRCS delivery model. In the current delivery model of the MRCS, international and national consultants are carrying out many of the activities/tasks with coordination, facilitation and supervision from MRCS staff. In addition, the staff of MRCS facilitates and

supports monitoring and evaluation of basin conditions, regional discussion, negotiation and communication with support from the NMCSs. The ongoing transition towards national implementation of regional planning and basin management processes will gradually change this delivery model. The joint basin expert groups (with their national agencies) will in the longer term carry out most of the activities/tasks that are now being implemented by consultants.

It may take 10 or more years to transition towards this delivery model, as the basin and countries become developed and the region more integrated, whereby regional planning and basin management is an integral part of national planning and governance processes, coordinated by the MRCS/NMCSs. The **MRC, as a coordinating RBO, would be supported by a smaller, expert MRCS** (to monitor, assess, forecast and report on basin conditions, coordinate policy, diplomacy, and technical analysis, and to undertake contract management) with much of the integrated river basin management work undertaken by Member Countries. This is the model that has evolved for many international RBO's as they reach a more 'mature' phase.

Improving the MRCS structure. During the MRC SP period (2021–2025), the organisational structure and staffing of the MRCS will be improved to become more aligned with the MRC's core functions and to meet the needs for supporting the implementation of the new BDS/MRC SP in the best possible way. A proposal to this end has been made alongside the preparation of this MRC SP. When approved by the Member Countries, the new structure will be implemented from 2022, and the designated "Lead" MRCS division column for each activity will be updated accordingly. The total number of staff will decrease gradually through phasing out duplicating or unnecessary positions, as well as further strengthening of the MRCS work planning, financial, administrative and management and monitoring systems. In the longer term, when joint basin expert groups and their national agencies have taken over most CRBMF activities, the size of the MRCS can be further reduced to 50 from 2030.

Development Partners (DPs)

While Member Countries increase significantly their financial contribution to USD 25 million for the MRC SP 2021–2025, well in line with their commitment in the Roadmap, a significant percentage of funding for the MRC would still be needed from MRC DPs. While the MRC SP is driven by Member Countries, it is important to continue and deepen MRC-DP cooperation, through the following measures that will enhance the engagement and support that DPs provide to the MRC in its strategic, technical, planning and monitoring work:

- Commitment by DPs to contribution to the basket funding (to enable greater efficiency and agility in allocating resources to priority needs as agreed in the MRC SP), and if needed through earmarking for specific areas;
- Where appropriate, provision of targeted technical/financial assistance from DPs to MRCS and/or Member Countries, including in their NIPs (to tackle challenges identified in section 4.5);
- Participation in the Budget Committee (for administrative and financial matters);
- Regular consultations between DPs and MRC attached to the annual Informal Partners Meeting (especially technical matters) and annual Partners Consultative Group Meeting (especially strategic matters).

9.2 External stakeholder engagement

The BDS provides the rationale for broader and deeper engagement with partners and other stakeholders in sustainable water resources development and management throughout the basin. Indeed, there is a common interest from stakeholder groups throughout the basin to engage in proactive regional planning and coordinated basin management operations.

MRC stakeholder engagement will be managed by the OCEO. The BDS approach for enhanced stakeholder engagement (Section 6.3) will be mainstreamed in the MRC multi-year work plans through dedicated tasks, similar to the enabling tasks aimed at capacity building for decentralization of CRBMFs and for uptake of MRC deliverables in national governance, decision-making and planning (see Section 8.1). Key external stakeholders and their interests have been identified and the purpose of engagement for this MRC SP period described (Table 9.1).

Table 9.1. Interests and roles of external stakeholders in supporting MRC SP implementation

Stakeholder	Interest of stakeholder	Purpose of engagement by the MRC
China	Regional cooperation for socio-economic development, economic integration and political stability, regional reputation	Further increasing policy dialogue, data and information sharing and technical exchanges to facilitate basin planning and management, including flood and drought management
Myanmar	Knowledge sharing on basin development and management Regional cooperation	Strengthening dialogue and technical exchanges

Stakeholder	Interest of stakeholder	Purpose of engagement by the MRC
MLC Water	Water resources and green development	Implementation of current MoU
	IWRM and climate change adaptation	Dialogue to explore opportunities to optimize the basin-wide approach in water and related resources development and management
	Water sector production capacity	
	Rural areas, water conservancy and livelihood improvement	Setting up joint basin expert groups for regional proactive planning, coordinated basin management operations, and water-related monitoring and DSS facilities
	Sustainable hydropower development and energy security	
	Transboundary river cooperation and information sharing	Collaboration on common projects and activities, including the development of the Multiple Stakeholder Platform, strengthening flood and drought management capacity, enhancing data sharing and developing a mainstream early warning system, and reviewing cooperation mechanisms and modalities for Mekong transboundary river management
	Coordination with other areas	
ASEAN	Regional cooperation and integration	Implementation of current MoU
	IWRM Country strategy guideline and indicator framework implementation	Making contributions to BDS Outcomes and Outputs, particularly in relation to environment, social improvements and water security
	Water quality and sanitation	
	Water-related disasters	Collaboration on common projects, including on water-related disasters and water quality
	Climate change mitigation, adaptation and resilience	Key MRC strategies, guidelines and perspectives are discussed and supported at relevant ASEAN forums and agendas Ensuring debates about critical, water and related basin-wide opportunities and issues are framed appropriately and influence relevant decision-making processes, including through a standing ASEAN-MRC Water Security Forum

Stakeholder	Interest of stakeholder	Purpose of engagement by the MRC
GMS	<p>Natural resources and ecosystem services</p> <p>Regional power market integration</p> <p>Climate resilience and disaster risk management</p> <p>Agriculture</p>	<p>Making contributions to BDS Outcomes and Outputs, particularly in relation to energy and environment</p> <p>Participation in GMS Regional Power Trade Coordination Committee (RPTCC) to keep abreast of future developments</p> <p>Strengthen integration of MRC strategies and guidelines into GMS water and related investment appraisal and planning tools and the support of ADB for further integration into national frameworks</p>
Other partners and multilateral agencies (UN, World Bank, ADB)	<p>Raising living standards and securing socio-economic benefits and regional political stability</p> <p>Sustainable water resources development and management</p> <p>International cooperation</p>	<p>Greater awareness and strategic and water diplomacy support among senior officials for alignment/harmonization of approaches in line with MRC assessments, strategies and recommended development pathways</p> <p>Technical and financial support</p> <p>Making contributions to BDS Outcomes and Outputs</p> <p>Promotion of sharing experiences with other international river basins</p>
Private sector entities	<p>Participation in national development activities</p> <p>Confidence in national and regional governance processes for beneficial investments</p>	<p>Preparation and implementation of BDS sustainable development opportunities in line with national and regional frameworks (procedures, strategies and guidelines)</p> <p>Uptake and use of relevant MRC Procedures, strategies, guidelines and tools</p>
Civil society organizations, communities	<p>Securing socio- economic benefits and avoiding negative impacts from water-related developments</p>	<p>Promotion of common understanding of the evidence base relating to the basin</p> <p>Participation in the basin planning and management process to raise their interests, concerns and policy recommendations</p> <p>Represent the interests of the vulnerable groups, women and children, and the environment</p>
Research institutes and academia	<p>Bringing in new perspectives to policies and development strategies to ensure equitable distribution of wealth and opportunity</p>	<p>Promotion of common understanding of the evidence base relating to the basin</p> <p>Collaboration in preparing and promoting MRC assessments and tools development</p>

Stakeholder	Interest of stakeholder	Purpose of engagement by the MRC
Media	Raising awareness	Promotion of greater understanding of the role and benefits of MRC Clarification of issues from scientific perspectives

The BDS proposes to ‘institutionalise’ external stakeholder engagement in a Multiple Stakeholder Platform (MSP) with a mandate to undertake regular stakeholder reviews of the implementation of the BDS (see Section 6.3). This would offer an opportunity for cooperation between MRC and MLC Water since an MSP for Lancang-Mekong water resources cooperation is also on the list of proposed projects of MLC Water (with support from all six basin countries). All basin countries and relevant regional cooperation mechanisms and partners will be involved in the design and development of the platform to ensure synergies and productivity, starting with the preparation of an informative concept note.

9.3 Multi-year work planning

This five-year MRC SP serves as a macro-level planning tool for the MRC at the regional level. It will be operationalised through rolling two-year work plans, which show continuation of work, especially activities that run over several years. Multi-year work planning will also help national line/implementing agencies integrating MRC SP activities in their workplan for better national implementation. The budget for the rolling two-year workplans can be revised every year or more frequently, as required.

The preparation of the work plans will be guided by the schedule of activities and provisional budgets in this MRC SP. Each of these activities will be further elaborated in tasks, required resources, linkages to other tasks, and then consolidated in an overall work plan with procurement plans, management responsibilities, and matching revenue and budget streams. Every year account will be taken of progress made over previous years and the ongoing availability of funds.

MRCS will lead the preparation of the work plan, in accordance with the procedures provided in the updated MRC Finance Manual (20 November 2019). The process starts with the issuing of a Guidance Note by the CEO setting out the broad parameters within which each work plan is to be prepared (see Figure 9.2). To prepare the Guidance Note, the CEO, with the support of OCEO, will consult with senior management staff (comprising Division Directors), JC and DPs. The Guidance Note will include:

- Key achievements and difficulties of the previous years, current status of MRC SP implementation, and lessons for future implementation;
- A Statement of the overall budget for the two years, based on the indicative budgets set out in this MRC SP and modified by funding realities for the specific years;
- Implementation priorities (MRC SP activities) for the years including significant crosscutting issues to be addressed, with associated timelines;
- Template for activity and task descriptions, interdependencies between activities/tasks, progress milestones, resourcing, procurement, and budgeting;
- Assignment of responsibility for the implementation of MRC SP activities to MRC organisational units, and the management, reporting and MRC's organisational M&E system;
- A consultation framework, stipulating whom to be consulted as part of the preparation;
- Tentative timetable, including working sessions, national and regional consultations, the circulating of the final draft and formal meetings of Budget Committee, JC and Council.

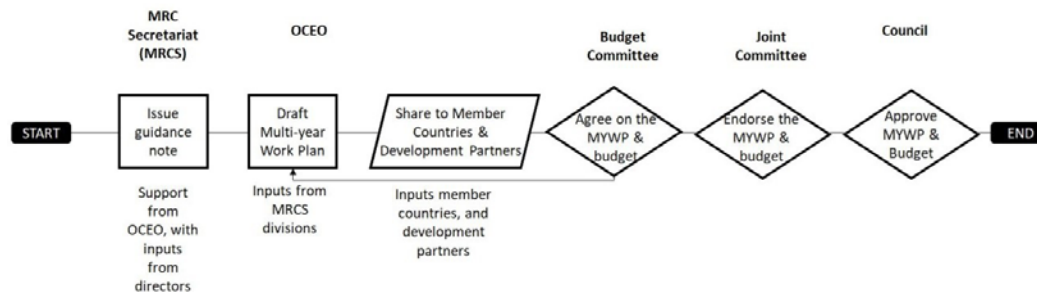


Figure 9.2. The MRC work plan formulation process

The OCEO will prepare the rolling two-year work plans, and update them as necessary each year, with inputs from the MRCS Divisions, Member Countries and DPs. The work plan preparation process includes the balancing of budget and revenue projections through prioritization of activities.

Approval of work plan. The completed draft work plan will be submitted to the BC for review. Once agreed by the Budget Committee, the work plan will be submitted to the JC for endorsement and to the Council for approval.

The implementation of the work plan will be managed in accordance with the updated MRC operational manuals. The delivery of activities and tasks will be distributed among MRC organisational units, with collaboration by others. MRC's organisational M&E system tracks activity/task delivery, and financial status. The system flags key areas of concern where interventions are needed to bring an activity back on course to regular senior management meetings (see BDS Section 6.5). This feedback loop will facilitate timely corrective measures to be taken, including prioritisation of resources in annual reviews of work plans and budgets to redress delays in critical activities.

9.4 Financial arrangements and budget

The cost of implementation of the MRC SP results chain in Section 8.2 to 8.6 has been estimated based on the 95 identified activities and associated enabling tasks related to impact pathways, stakeholder engagement and capacity building. All activities and tasks belong to the core functions of the MRC as described in Section 8.1. A summary of the estimated and indicative budget per main core function is presented in Table 9.2.

Table 9.2. Estimated budget ('000 USD) per core function for the 2021–2025 plan period

Core Function	Routine	Non-routine	Grand Total	Share
CF 1 - Corporate services core functions	\$ 5,635,000	\$ 1,640,000	\$ 7,275,000	12%
CRBMF 1 - Data acquisition, exchange and monitoring	\$ 7,850,000	\$ 400,000	\$ 8,250,000	14%
CRBMF 2 - Analysis, modelling and assessment	\$ 270,000	\$ 3,450,000	\$ 3,720,000	6%
CRBMF 3 - Planning support	\$ 3,206,000	\$ 3,963,000	\$ 7,169,000	12%
CRBMF 4 - Forecasting, warning and emergency response	\$ 517,000	\$ 3,050,000	\$ 3,567,000	6%
CRBMF 5 - Implementing MRC Procedures	\$ 1,314,000	\$ 78,800	\$ 1,392,800	2%
Grand Total	\$ 18,792,000	\$ 12,581,800	\$ 31,373,800	52%
Fixed Cost:				\$ 29,132,592
				48%
Grand Total:				\$ 60,506,392
				100%

The total budget for the implementation of the MRC SP is about USD 60.5 million, or USD 12 million on average per year. Table 9.2 shows that the total budget for the implementation of MRC's core functions during 2021–2025 is about USD 31 million, excluding fixed cost for staff and administration. Core routine activities are estimated at USD 19 million and core non-routine activities cost at USD 12.5 million.

The designation of core routine and core non-routine may become useful when making work plans and allocating available budgets. Ideally, all should be funded as both are of equal importance. However, if budget is limited, core routine works should be funded first (as a matter of sequencing and not prioritization), in order to maintain the minimum functions of an RBO like the MRC. This is not optimal, however, and timely efforts should

be made to fund and start the core non-routine works as they are critical in delivering better Outcomes from core routine activities and strategic BDS and MRC SP objectives.

The high expenditures for non-routine CRBMF activities is a direct result of the need to strengthen MRC's enhanced role in proactive regional planning and coordination of operational management in the Mekong River Basin, without which the MRC cannot effectively respond to the changing basin conditions and the needs of the countries and peoples. The budget is unevenly distributed over the main Outputs and core functions, as can be expected. Some Outputs related to non-routine CRBMF activities are costly and provide essential inputs to several other Outputs across the five Strategic Priorities.

Budget and contributions. Table 9.3 summarizes the MRC SP budget required by category of budget and the anticipated contributions from both Member Countries and Development Partners. Table 9.3 shows that:

The annually increasing funding from Member Countries is sufficient to cover the fixed costs of the MRC, including staff costs and some administration and support to NMCSs. The goal of the MRC is to have all routine MRC core functions fully funded by the Member Countries by 2030. To ensure the long-term sustainability of the Commission, the MRC will not exclude development assistance contributions to the MRC cooperation beyond 2030 for non-routine CRBMFs, but will not be dependent on external assistance for its core routine operations (which are by then sufficiently strengthened);

- Total anticipated contributions from Development Partners (DPs) are still larger than those of the Member Countries (a little over 60 percent of total budget), without which the MRC SP cannot be implemented. Despite strong commitment of the DPs to continue supporting the MRC, there are uncertainties in part due to COVID-19, which are addressed in Section 8.7 on MRC SP responses and Section 9.5 on risk management.

Table 9.3. Expected expenditures and contributions during plan period (2021–2025)

Budget and contributions	Million USD	Share (%)
Budget		
Fixed costs (staff and administration)	29	48
Routine CF and CRBMF activities	19	31
Non-routine CF and CRBMF activities	12.5	21
Total	60.5	100
Contributions		
Member Countries	25	41
Development Partners (Basket Fund and Earmarked)	35.5	59
Other contributions	tbc	tbc
Total	60.5	100

The MRC basket funding is a joint financial mechanism whereby Member Countries and DPs contribute funds to a common pooled account that is used to fund MRC activities through the MRCS. The annual funds will be pooled from the designated DPs' accounts (receiving accounts) into the basket fund account and allocated to the activities of the responsible MRC units based on core functions including administration, governance, liaison and CRBMFs for implementation.

Within this arrangement, **earmarking** funds will be possible, but DPs wishing to contribute to the implementation of this MRC SP will be required to contribute a proportion of their funds (provisionally 15%) as "unallocated" to the basket fund in order to balance with all other contributors who contribute all of their funds to the basket fund.

The annual budget allocation for corporate services and the routine CRBMFs is fairly evenly distributed during 2021–2025. The budget allocation for the non-routine CRBMFs is somewhat skewed to the latter years of this MRC SP period as it is expected that it will take 1–2 years to plan, start-up and procure the services for the larger activities required for more proactive regional planning and the consolidation and modernization of the basin's monitoring networks. This allows time to raise fund and secure financial commitments from DPs in 2021 and 2022.

The indicative budget per Output and activity is as follows. The budgets are indicative only and will be further examined and revised during the work planning process when making multi-year work plans, which will be carefully reviewed by the Budget Committee, and endorsed/approved by the Joint Committee and Council.

Table 9.4. Indicative budget per Output and activity ³²

Output and Activities	CRBMFs	CRBMF Category	Total
Output 1.1.1: Guidance for water flow and quality management implemented			759,000
1.1.1.1 Revisit PMFM and identify and evaluate potential new implementable flow thresholds (and methodologies) for guiding the monitoring and management of flow conditions in the mainstream (incl. for rapid river level fluctuations, minimum flood season, maximum dry season flows and to enable adequate reverse flow and other important functions of Tonle Sap)	CRBMF 2 - Analysis, modelling and assessment	Non-routine	200,000
1.1.1.2 Implement PMFM guidelines including any updated or additional implementable flow thresholds	CRBMF 5 - Implementing MRC Procedures	Routine	30,000
1.1.1.3 Review and update the PWQ including with new methods for identifying and monitoring water quality related emergency incidents (informed by recent experience) and emerging water quality issues (e.g. plastics)	CRBMF 2 - Analysis, modelling and assessment	Non-routine	150,000
1.1.1.4 Implement PWQ guidelines including any new monitoring methods and parameters (e.g. for plastic pollution)	CRBMF 5 - Implementing MRC Procedures	Routine	194,000
1.1.1.5 Support implementation of the <i>Regional Action Plan for Sustainable Transport of Dangerous Goods</i>	CRBMF 3 - Planning support	Routine	135,000
1.1.1.6 Implement PWUM using upgraded DSF connected to ground, global and satellite datasets	CRBMF 5 - Implementing MRC Procedures	Routine	50,000
Output 1.1.2: Guidance and measures for impact mitigation of water infrastructure implemented			795,000
1.1.2.1 Support use and integration of Preliminary Design Guidance in regional and national regulatory frameworks	CRBMF 3 - Planning support	Routine	206,000

³² These are indicative budget subject to further revision during work planning. The budgets for some activities (which appear small) have been combined with other related activities that will be implemented together. A large amount of work for the new MRC SP will be implemented in “packages” of several related activities by cross-cutting core teams from relevant divisions (not each activity by itself by each division).

1.1.2.2 Support implementation of Joint Action Plans for all mainstream hydropower projects	CRBMF 3 - Planning support	Routine	300,000
1.1.2.3 Support implementation of RSAT in Mekong tributaries	CRBMF 3 - Planning support	Routine	100,000
1.1.2.4 Support application and mainstreaming of the Guidelines for Transboundary Environmental Impact Assessment into national Environmental Impact Assessment systems and regulations	CRBMF 3 - Planning support	Routine	189,000
Output 1.2.1: Basin-wide sediment management plan developed and implemented			386,000
1.2.1.1 Undertake a study on sediment transport throughout the basin including on the sources and fate of sediments, the impact of existing and planned infrastructure and sediment extraction activities, and the extent and distribution of bank erosion	CRBMF 2 - Analysis, modelling and assessment	Non-routine	92,000
1.2.1.2 Identify options for reducing sediment trapping at existing and planned dams and for reducing sediment extraction taking into account the interacting factors that lead to bank erosion (for input to basin-wide scenario assessments)	CRBMF 2 - Analysis, modelling and assessment	Non-routine	170,000
1.2.1.3 Prepare a basin-wide sediment management plan based on a study of sediment transport and riverbank erosion, enhanced monitoring and initial scenario assessment work	CRBMF 3 - Planning support	Non-routine	124,000
Output 1.3.1: Limits of acceptable change for key river and connected wetland habitats identified and implemented			433,000
1.3.1.1 Identify and assess limits to adequately protect key regional environmental assets (i.e. wetlands) including consideration of early and quick flow into the Tonle Sap Lake and gradual flow out of the lake and other ecosystem functions and services, through engagement of scientific expertise, national agencies and local communities	CRBMF 2 - Analysis, modelling and assessment	Non-routine	233,000
1.3.1.2 Support Member Countries in updating, developing and implementing management plans for priority regional environmental assets identified in the SBEM and other regional environmental strategies	CRBMF 3 - Planning support	Routine	200,000
Output 1.3.2: A basin-wide planning and management framework for watersheds agreed and implemented			304,000
1.3.2.1 Identify good practice institutional, governance and regulatory arrangements for the management of watersheds with opportunities for harmonisation and capacity building between countries	CRBMF 2 - Analysis, modelling and assessment	Non-routine	88,000
1.3.2.2 Develop a basin-wide planning and management framework for watersheds that include key regional environmental assets due to their role in providing regionally significant ecosystem services	CRBMF 3 - Planning support	Non-routine	216,000

Output 2.1.2: Capture fisheries regulatory frameworks improved to support food security			392,000
2.1.2.1 Review and incorporate important fish habitats into the network of key regional environmental assets and their management plans and evaluate the effectiveness of conservation measures including in relation to vulnerability to climate change	CRBMF 3 - Planning support	Routine	116,000
2.1.2.2 Support enhanced institutional, governance and regulatory arrangements within national and provincial fisheries management frameworks including socio-economic monitoring and research on fisheries related issues, such as fish stock assessments	CRBMF 3 - Planning support	Routine	176,000
2.1.2.3 Support agreed transboundary fisheries management projects assessments	CRBMF 3 - Planning support	Routine	100,000
Output 2.1.3: Risks to capture fisheries productivity and diversity minimized to support food security			369,000
2.1.3.1 Evaluate the effectiveness of existing fish passages for hydropower and irrigation structures (including by working with developers) and potential alternative designs in relation to the unique fish ecology of the basin	CRBMF 2 - Analysis, modelling and assessment	Non-routine	240,000
2.1.3.2 Support national uptake of recommended actions and guidelines (including by working with developers) for improving fish passage or other adaptation measures for hydropower and irrigation structures	CRBMF 3 - Planning support	Routine	129,000
Output 2.1.4: Gender and vulnerability aspects of basin water, food and energy security addressed			407,000
2.1.4.1 Undertake a desk review and analysis, in collaboration with relevant partners, of the multiple gender and vulnerability aspects of basin water, food and energy security (including indigenous and minority ethnic groups and child labour) identifying specific needs, challenges and opportunities and including recommendations on cost effective and priority gender disaggregated data and vulnerability mapping requirements	CRBMF 2 - Analysis, modelling and assessment	Non-routine	100,000
2.1.4.2 Enhance national disaggregated data collection and mapping on gender and vulnerability within the Data Acquisition and Generation Action Plan, including to inform SDG reporting	CRBMF 1 - Data acquisition, exchange and monitoring	Routine	220,000
2.1.4.3 Analyse data and information and provide recommendations on improving equity for vulnerable groups	CRBMF 2 - Analysis, modelling and assessment	Non-routine	87,000
Output 3.1.1: The Basin Development Plan and associated national plans for water resources development are informed by the findings of a more proactive regional planning approach			2,500,000
3.1.1.1 Assess options for water resources development including increasing natural and constructed water storage to support water security, irrigation, hydropower, fisheries and environmental outcomes, using GIS/EO technology and field work	CRBMF 2 - Analysis, modelling and assessment	Non-routine	-

3.1.1.2 Formulate basin-wide development scenarios (in addition to previously assessed national plans) with alternative development options considering gender and vulnerability, and update the existing basin-wide assessment methodology	CRBMF 3 - Planning support	Non-routine	-
3.1.1.3 Initial assessment of the agreed basin-wide development scenarios for environment, social and economic outcomes and the distribution of benefits and costs, including with the use of socio-economic and vulnerability mapping	CRBMF 3 - Planning support	Non-routine	2,500,000
Output 3.2.1: Investment and associated measures in irrigated agriculture implemented			714,000
3.2.1.1 Coordinate development of guidelines on sustainable transboundary groundwater management and support implementation through country-to-country capacity building	CRBMF 3 - Planning support	Non-routine	299,000
3.2.1.2 Identify opportunities, promote and provide guidance on irrigation development opportunities, for adaptation to climate change, improved food security, and reduced inequity	CRBMF 3 - Planning support	Routine	415,000
Output 3.2.2: Sustainable hydropower development strategy and related regional energy plans implemented in synergy			330,000
3.2.2.1 Support implementation of the SHDS and coordinate and promote alignment with regional energy plans (incl. GMS and ASEAN)	CRBMF 3 - Planning support	Routine	230,000
3.2.2.2 Assess alternative cost-effective regional energy/water system integration options (e.g. floating solar with hydropower, seasonal storage, cross basin and regional generation efficiency, etc.) within the context of broader energy sector plans including solar and wind and as informed by comprehensive regional options assessment(s) by countries and other regional actors (ASEAN, GMS, etc.)	CRBMF 3 - Planning support	Non-routine	100,000
Output 3.2.3: Investment and associated measures in basin navigation plans implemented in synergy			400,000
3.2.3.1 Support the implementation of the <i>MRC Masterplan for Regional Waterborne Transport in the Mekong River Basin in alignment with the JCCCN Development Plan on International Navigation on the Lancang-Mekong River (2015-2025)</i> in consultation with all basin countries	CRBMF 3 - Planning support	Routine	100,000
3.2.3.2 Facilitate the harmonisation of navigation rules and regulations between LMB countries and support national implementation	CRBMF 3 - Planning support	Routine	200,000
3.2.3.3 Facilitate and coordinate navigation investments including for tourism purposes in accordance with existing or updated plans	CRBMF 3 - Planning support	Non-routine	100,000
Output 3.2.4: Investment and associated measures in regional environmental strategies and programmes implemented in synergy			260,000
3.2.4.1 Support the implementation of the SBEM and investment projects and associated measures for the conservation and promotion of wetlands and watersheds, including for climate resilience	CRBMF 3 - Planning support	Routine	100,000

3.2.4.2 Raise awareness and build capacity (including technical knowledge) in leveraging ecosystem services from wetlands and watersheds through alternative financial mechanisms including carbon offsets, and ecotourism	CRBMF 3 - Planning support	Non-routine	160,000
Output 3.2.5: Investment and associated measures to adapt to changes in fish populations and catch composition identified and implemented			245,000
3.2.5.1 Support the implementation of investments and associated measures to enhance fisheries consistent with the BFMS	CRBMF 3 - Planning support	Routine	100,000
3.2.5.2 Explore alternative futures for fish populations and catch composition resulting from water resources development and climate change and identify options to adapt to these changes and maintain viable fish populations (including consideration of aquaculture development and trade)	CRBMF 3 - Planning support	Non-routine	105,000
3.2.5.3 Evaluate investments and other options to maximise fisheries production under changed river conditions as a result of water resources development and climate change, and support the preparation of identified investments	CRBMF 3 - Planning support	Non-routine	40,000
Output 4.1.1: A core river monitoring network for the mainstream and remaining national river monitoring networks consolidated			5,600,000
4.1.1.1 Assess, redesign and develop the basin's core river monitoring networks, incorporating JEM, for regional and national planning and management based on a comprehensive network analysis informed by current and future needs	CRBMF 1 - Data acquisition, exchange and monitoring	Non-routine	400,000
4.1.1.2 Strengthen capacity and commitment for the consolidation and enhancement of nationally managed river monitoring networks	CRBMF 1 - Data acquisition, exchange and monitoring	Routine	-
4.1.1.3 Implement river monitoring network, analysis and reporting activities (hydro-meteorological, discharge and sediment, water quality, fisheries, and ecological health) including the Joint Environmental Monitoring of mainstream hydropower and other water infrastructure and enhanced monitoring of erosion, sedimentation and transport of sediments	CRBMF 1 - Data acquisition, exchange and monitoring	Routine	5,200,000
Output 4.1.2: Integrated data and information systems for more effective basin-wide data management and sharing			1,430,000
4.1.2.1 Complete inventory, standardisation, harmonisation and update of data, information and documents and migrate them into integrated databases with improved QA/QC procedures	CRBMF 1 - Data acquisition, exchange and monitoring	Routine	1,420,000
4.1.2.2 Upgrade remote sensing and satellite imagery repository and develop capacity of handling and using satellite products for water resource application	CRBMF 1 - Data acquisition, exchange and monitoring	Routine	10,000

4.1.2.3 Operate and maintain integrated databases, information, systems and tools at regional and national levels	CRBMF 1 - Data acquisition, exchange and monitoring	Routine	-
Output 4.1.3: Compatible Decision Support Systems in line with reinvigorated data, modelling, forecasting, and communication capabilities			2,130,000
4.1.3.1 Further study the design, management and use of the region's DSS's and plan a regional system of compatible DSS's (MRC's DSF and Member Countries' DSS's, as well as linkages to DSS's in Upper Mekong River Basin countries)	CRBMF 2 - Analysis, modelling and assessment	Non-routine	70,000
4.1.3.2 Upgrade the MRC Decision Support Framework with the latest international standards and technologies in order to serve both planning and operational management purposes, building on the reinvigoration of MRC's data, information, modelling and communication systems	CRBMF 2 - Analysis, modelling and assessment	Non-routine	2,020,000
4.1.3.3 Maintain and operate modelling and analysis tools including the updated ones as part of the upgraded DFS (e.g. production of spatial datasets)	CRBMF 2 - Analysis, modelling and assessment	Routine	-
4.1.3.4 Maintain web-based DSF (including communication tools, improved MRC Web Portal, and development of apps) in support of decision-making and active public communication	CRBMF 2 - Analysis, modelling and assessment	Routine	-
4.1.3.5 Support capacity building and promote the development of reinvigorated and compatible DSS's in all basin countries	CRBMF 2 - Analysis, modelling and assessment	Routine	40,000
Output 4.1.4: Integrated basin-wide flood and drought forecasting and early warning			3,205,000
4.1.4.1 Develop an improved and integrated regional system for basin-wide flood and drought forecasting and early warning (extension to monthly forecast, three to six monthly and seasonal outlook)	CRBMF 4 - Forecasting, warning and emergency response	Non-routine	3,050,000
4.1.4.2 Implement improved and integrated flood and drought forecasting and early warning information to basin countries through compatible DSS's, enhanced exchange of data, consolidated water monitoring networks, and agreed communication protocols	CRBMF 4 - Forecasting, warning and emergency response	Routine	115,000
4.1.4.3 Implement flash flood guidance to basin countries through reinvigorated and compatible DSS's, enhanced exchange of data, consolidated water monitoring networks, and agreed communication protocols	CRBMF 4 - Forecasting, warning and emergency response	Routine	40,000

Output 4.1.5: Joint State of Basin Report and Basin Development Strategy			1,230,000
4.1.5.1 Implement the MRB-IF and Data Acquisition and Generation Action Plan to enable preparation of the 2023 State of Basin Report with improved consistency and alignment of basin-wide datasets	CRBMF 1 - Data acquisition, exchange and monitoring	Routine	1,000,000
4.1.5.2 Prepare the 2023 State of Basin Report with all six basin countries as a mid-implementation report on the BDS 2021–2030	CRBMF 2 - Analysis, modelling and assessment	Routine	230,000
Output 4.2.1: Coordinated water infrastructure operations for multiple benefits including disaster mitigation and management			464,000
4.2.1.1 Continue review of existing dam operating rules and cooperation arrangements and experiences, and identify opportunities for coordinated flow management to increase efficiency, reduce impacts and help mitigate floods and droughts	CRBMF 3 - Planning support	Non-routine	93,000
4.2.1.2 Develop and implement cooperation mechanisms for data and information sharing for existing dam operations (linked to JAPs) to optimise regional benefits and minimise regional costs	CRBMF 3 - Planning support	Non-routine	113,000
4.2.1.3 Develop and implement cooperation mechanisms for data and information sharing for new dams and other water infrastructure to optimise regional benefits and minimise regional costs	CRBMF 3 - Planning support	Non-routine	113,000
4.2.1.4 Develop and implement information sharing and communication mechanisms for water-related emergencies including water quality, navigation and dam safety	CF 1 - Corporate services core functions	Non-routine	145,000
Output 4.2.2: Climate change adaptation, flood and drought management mainstreamed at national levels			742,000
4.2.2.1 Support mainstreaming of climate change adaptation to increased climate risks, floods and droughts into regional and national strategies, plans and projects	CRBMF 3 - Planning support	Routine	100,000
4.2.2.2 Coordinate enhanced access to international climate finance through climate fund accreditation for the MRC	CF 1 - Corporate services core functions	Non-routine	70,000
4.2.2.3 Support implementation of the Drought Management Strategy including by finalising and implementing the drought adaptation guidelines	CRBMF 4 - Forecasting, warning and emergency response	Routine	180,000
4.2.2.4 Support implementation of agreed strategic directions to manage existing, future and residual flood risks in the LMB	CRBMF 4 - Forecasting, warning and emergency response	Routine	182,000

4.2.2.5 Further identify and facilitate implementation of transboundary projects on climate change adaptation and water resources management (including pilot projects to improve knowledge, management, systems and cooperation in response to increased floods and droughts)	CRBMF 3 - Planning support	Routine	210,000
Output 5.1.1: Implementation of the MRC Procedures enhanced			1,118,800
5.1.1.1 Review and improve the implementation of all MRC Procedures (PDIES, PNPCA, PMFM, PWQ, PWUM), including by synthesizing evaluation results and lessons learned from emerging work on their implementation through the Joint Platform	CRBMF 5 - Implementing MRC Procedures	Routine	200,000
5.1.1.2 Based on the agreed proposal, improve the Technical Guidelines (TG) for implementing the PNPCA	CRBMF 5 - Implementing MRC Procedures	Non-routine	52,000
5.1.1.3 Based on the agreed proposal and the implementation experience of MRB IF and DAGAP, improve the Technical Guidelines (TG) for implementing the PDIES	CRBMF 5 - Implementing MRC Procedures	Non-routine	26,800
5.1.1.4 Implement the PNPCA taking into account the updated TG and related technical guidelines for other Procedures	CRBMF 5 - Implementing MRC Procedures	Routine	830,000
5.1.1.5 Implement the PDIES, taking into account the updated TG and related technical guidelines for other Procedures, through the MRB IF and DAGAP	CRBMF 5 - Implementing MRC Procedures	Routine	10,000
Output 5.1.2: Organisational development of the Mekong River Commission			4,629,000
5.1.2.1 Prepare and implement an organisational development plan for the MRC towards 2030 (including the Council, JC, MRCS (and RFDMC), NMCs, NMCSs and Expert Groups) based on agreed vision of future capacity, diversity and gender, revised ROPs, organisational structure, function, and personnel, and operating arrangements	CF 1 - Corporate services core functions	Non-routine	280,000
5.1.2.2 Coordinate and build capacity for national implementation of decentralised CRBMFs to achieve regional objectives, planning and management including through joint basin expert groups and guidance on integrating regional work into national ToRs and job descriptions	CF 1 - Corporate services core functions	Routine	394,000
5.1.2.3 Institutionalize 'uptake of Outputs' as part of the development and implementation process for all MRC products and services based on the Uptake Guidelines	CF 1 - Corporate services core functions	Routine	100,000
5.1.2.4 Establish a staff secondment programme between regional level and national implementing agency levels (all 6 countries) building on the Junior Riparian Professional Programme	CF 1 - Corporate services core functions	Non-routine	645,000
5.1.2.5 Manage human resources and procurement in-line with HR and Procurement Manuals and Fraud Prevention and Anti-Corruption (FPAC) Mechanism	CF 1 - Corporate services core functions	Routine	50,000

5.1.2.6 Operate the new financial management information system in line with Finance Manual and FPAC, and in support of work planning, budget monitoring and reporting	CF 1 - Corporate services core functions	Routine	50,000
5.1.2.7 Enhance internal controls, including operationalization of the Audit Committee and Internal Auditor	CF 1 - Corporate services core functions	Routine	-
5.1.2.8 Organise and coordinate MRC governance meetings including 2022 Summit, Council, Joint Committee, Joint Committee Task Force, and Budget Committee	CF 1 - Corporate services core functions	Routine	2,000,000
5.1.2.9 Prepare the Multi-year Work Plans to implement the MRC SP	CF 1 - Corporate services core functions	Routine	200,000
5.1.2.10 Support the preparation and implementation of the National Indicative Plans to implement the BDS 2021–2030 and MRC SP 2021–2025 and 2026–2030	CF 1 - Corporate services core functions	Routine	260,000
5.1.2.11 Prepare the MRC SP 2026–2030 to implement the remaining five years of the BDS 2021–2030	CF 1 - Corporate services core functions	Routine	250,000
5.1.2.12 Monitor, evaluate and report on the implementation of the MRC SP, NIPs and the contribution of water-related activities (projects and programmes) of Mekong-related regional cooperation mechanisms to the BDS	CF 1 - Corporate services core functions	Routine	400,000
Output 5.2.1: Common understanding on the potential future institutional arrangements for entire basin management			195,000
5.2.1.1 Further clarify mandates, areas of common interests, and comparative advantages in the changing basin context for Mekong related regional cooperation mechanisms and frameworks	CF 1 - Corporate services core functions	Non-routine	90,000
5.2.1.2 Explore and evaluate in a participatory manner the institutional options for managing the Mekong River Basin by 2030	CF 1 - Corporate services core functions	Non-routine	105,000
Output 5.2.2: Significant joint investment projects and national projects of basin-wide significance and associated measures agreed based on consideration of trade-offs, benefit sharing and risks			200,000
5.2.2.1 Facilitate consideration of proposed joint investment projects and measures and national projects of basin-wide significance including trade-off and benefit sharing discussions, and the comparison with benefits and costs of existing national water related development plans	CF 1 - Corporate services core functions	Routine	100,000
5.2.2.2 Support the preparation of agreed significant joint investment projects and national projects of basin-wide significance	CRBMF 3 - Planning support	Routine	100,000

Output 5.2.3: Mekong water-related cooperation mechanisms and relevant partnerships implemented in collaboration with countries			751,000
5.2.3.1 Implement and enhance partnerships between MRC and Dialogue Partners as well as the Mekong-Lancang Cooperation on Water, including agreements for year-round data sharing on river flows and dam operations	CF 1 - Corporate services core functions	Routine	251,000
5.2.3.2 Implement and enhance partnerships between MRC and other Mekong water-related programmes of regional cooperation mechanisms (including ASEAN, GMS, ACMECS, Mekong-US, Mekong-Japan and Mekong-ROK)	CF 1 - Corporate services core functions	Routine	200,000
5.2.3.3 Implement and enhance partnerships towards BDS Strategic Priorities between MRC and all other relevant partners, including development partners, international organisations, RBOs, research institutes and universities, non-governmental organisations and the private sector	CF 1 - Corporate services core functions	Routine	200,000
5.2.3.4 Explore the options for establishing a Mekong Fund through multiple partnerships and financing sources for the benefit of environmental assets and vulnerable social groups	CF 1 - Corporate services core functions	Non-routine	100,000
Output 5.2.4: Joint Basin Expert Groups			175,000
5.2.4.1 Strengthen MRC Expert Groups with representatives from all six basin countries by deepening their technical cooperation and engagement under the MRC Dialogue Partnership and in cooperation with the LMC Water Center	CF 1 - Corporate services core functions	Non-routine	100,000
5.2.4.2 Coordinate and support the operations of the Expert Groups	CF 1 - Corporate services core functions	Routine	75,000

Output 5.2.5: Harmonised basin-wide stakeholder platform			1,210,000
5.2.5.1 Develop a Multiple Stakeholder Platform for the whole basin with countries and MLC Water and in consultation with other relevant partners (to consolidate and align) including clear objectives and guidelines on participation and contribution	CF 1 - Corporate services core functions	Non-routine	105,000
5.2.5.2 Coordinate the management and operations of the Multiple Stakeholder Platform (including the regional stakeholder forum) including consistent recording, reporting and impact tracking procedures in response to stakeholder input	CF 1 - Corporate services core functions	Routine	884,000
5.2.5.3 Implement proactive engagement and communication with stakeholders, the media, and the public	CF 1 - Corporate services core functions	Routine	221,000
			Fixed Cost: 29,132,592
			Routine: \$18,792,000
			Non-routine: \$12,581,800
			Total: \$31,373,800
			Grand Total: \$60,506,392

NOTE: In case of significant, unexpected funding shortfalls, especially during the first one or two years of the new MRC SP, the Outputs and activities will be prioritized in the multi-year work planning process based on criteria agreed by all Member Countries (activity 5.1.2.9 in Section 8.6). The criteria could be based on factors such as: sequencing core routine activities over core non-routine activities, relevance for achieving the most important BDS Outcomes, the ongoing progress and completion status of Outputs and activities, and the urgency and importance of the Outputs for regional and national planning.

9.5 Risk management

The following section sets out the main risks and risk management strategies for the period of the MRC SP. Several risks and risk management strategies identified in the MRC SP 2016–2020 remain valid. The risks identified reflect both basin-wide risks and organisational risks facing the MRC. The basin-wide risks are identified in the BDS (Section 4.5). Eight MRC organisational risks are identified below.

1. The MRC's expertise and impartiality are not valued in the region (Medium likelihood, High impact, and thus a High risk)

Without its position of trust and impartiality with Member Countries, the MRC could not deliver its MRC SP. Because of this unique position, the MRC can provide information and recommendations to Member Countries without the suspicion of bias or a hidden agenda. However, this trust and impartiality cannot be taken for granted; the MRC must work to maintain it.

The mitigation measures include improved communication of the MRC's mandate & work, improved engagement with wider stakeholder groups, and strengthened quality (evidence based and balanced) of MRC products. The MRCS will also more often publicly address unbalanced, biased and incorrect statements and journalism on water-related issues in social and other media, including by providing timely factual and even-handed information on the actual situation in the basin.

2. Coordination and inputs to the preparation and implementation of national development plans are insufficient to improve regional outcomes (High likelihood, High Impact, and thus a Critical risk)

If national development plans are not sufficiently informed about basin-wide effects and linkages, there is a high risk that collectively they will remain sub-optimal for all Member Countries (see Chapters 3 and 4). In the past, some of the MRC's strategies, guidelines and tools have not been taken up and/or used.

This situation will be mitigated by building 'uptake' into the multi-year work plans and NIPs as described in Section 8.1 and through greater involvement of national line/implementing agency staff in the preparation and implementation of activities as described in Section 9.3. In addition, the MRC's organisational M&E system now informs and tracks impact pathways, which are supported by enabling activities.

3. There is difficulty in reaching consensus among Member Countries on critical issues (High likelihood, High impact, and thus a Critical risk)

Differences of view between some or all Member Countries are always likely to exist. In some cases, these differences can be deeply held. Resolving differences by mutually satisfactory solutions remains an ongoing challenge for MRC. Failure to manage this risk will jeopardize Member Country commitment to the MRC.

This risk will be mitigated by a combination of proactive regional planning that goes beyond what countries are currently planning (as described in Section 4.2), the further strengthening of both in-house (MRCS) and Council/Joint Committee (including more pro-active role of the Chairs) water-diplomacy capacity to enable the MRC to act as an honest facilitator, and leveraging partnerships with MLC, ASEAN and other (multilateral) organisations.

4. There is difficulty in effectively implementing the MRC's cooperation mechanisms (High likelihood, Medium impact, and thus a High risk)

There is a risk that MRC cooperation mechanisms, including its five Procedures, as well as the BDS and basin-wide sector strategies, are not implemented effectively. This may arise through insufficient understanding of the purpose and role of a mechanism but also in cases where mechanisms fail to adapt to changes in expectations and needs.

This risk will be mitigated by incorporating the updating of the (interdependent) set of five Procedures in the results chain to ensure they are fit-for-purpose under the new basin realities and continue to deliver full value to Member Countries (see Section 8.6). Building 'uptake' into the multi-year work plans as described in Section 8.1 will also help implement MRC's cooperation mechanisms, as will strengthening and empowering joint basin expert groups and their national line/implementing agencies.

5. There are limited resources and capacity at national level to implement MRC's decentralised activities (Medium likelihood, High impact, and thus a High risk)

Under the decentralisation roadmap, Member Countries themselves are increasingly responsible for core MRC activities, not only for monitoring and data collection but increasingly also for basin planning and management activities, with coordination by MRCS, as described in Section 9.1. Capacity in Member Countries differs, however, and any significant gaps in the basin-wide knowledge base and deficiencies in institutional mechanisms for engaging in basin planning in some countries, will adversely affect the value for all Member Countries.

A key focal area of this MRC SP is to support increasing national implementation of CRBMFs to enable the continuing and gradual transition of MRC towards a leaner, 'expert' organization, as described in Section 9.1. For this purpose, a major organizational development and capacity plan will be implemented (Section 8.6), joint basin expert groups with representatives of national implementing agencies strengthened, and institutional mechanisms developed for mobilizing national implementing agencies to increasingly implement basin planning and management functions (Section 8.6).

6. Bureaucratic implementation of the MRC SP (Medium likelihood, High impact, and thus a High risk)

Experiences suggest that important MRC SP activities may not be adequately elaborated into informative concept notes and/or Terms of References, and therefore not adequately resourced and implemented. This lack of focus on Outcomes has hampered 'uptake' of Outputs and led to fragmented approaches to the development of MRC cooperation mechanisms (knowledge base, procedures). The implementation experiences of the current MRCS structure in the past 4 years also reveal challenges and issues to overcome, in order to create more optimal core functional base structure able to deliver integrated outcomes.

To help mitigate this risk, the MRC SP results chain provides guidance for the resourcing and implementation modalities of activities. The development and the implementation of the organizational development plan to 2030 will also contribute to the development of a less bureaucratic 'expert' organization (Section 8.6). In particular, operation of the updated MRCS structure, and the set-up of a practical integrated system for multi-year work planning and budget and activity performance monitoring will create organization-wide performance and staffing benefits (as the effectiveness of MRCS management largely depends on the quality of the management systems in place);

7. There is significant unexpected funding shortfall (Low likelihood, High impact, and thus a Medium risk)

The MRC SP is based on the financial commitments made to the MRC. Despite strong commitment of the DPs to continue supporting the MRC, the current context amidst COVID-19 is quite volatile and uncertainty is relatively high. Failure by self MRC Member Countries and/or DPs to deliver on these commitments would have a significant adverse impact for achievement of the Plan.

The mitigation measures to reduce this impact, should the risk be realized, include the prioritization of activities for Outputs and activities with the highest relevance in the multi-year work planning process (Section 9.3) to achieve the most important BDS Outcomes and the implementation of a fund mobilization strategy by the CEO. Reassuring

is that about half of all CRBMF activities is directly related to suppression and prevention of epidemics and pandemics such as COVID-19 (Section 8.7).

8. Financial management does not ensure transparency and accountability (Low likelihood, High Impact, thus a Medium risk)

MRC needs to achieve and maintain a high level of credibility in both procurement and financial management areas to secure sufficient MRC SP funding based upon a Basket fund model. This risk is assessed as having a low likelihood as MRC has been mitigating this risk for the past few years.

To mitigate this risk, an independent Audit Committee and Internal Auditor, as well as the full implementation of the updated Finance and other manuals, needs to continue. As a result, actions will be taken to address any monitored and reported wrongdoings.

Operationalisation of risk management matrix. The risk management strategies are an integral part of the implementation of this MRC SP and are addressed in the activity/task chains in Chapter 8, as indicated in the risk management matrix in Table 9.4 below. The table summarizes the identified basin-wide risks and the MRC organisational risks together with the risk category and the identified mitigating measures. The MRC judges that the proposed mitigation measures will be adequate to control the risks, although they may not eliminate the risks entirely. The organizational risks identified also help frame the risks associated with MRC SP deliverables and what specific measures are planned in the work plan. The MRC will review this assumption regularly: every year, the MRC Secretariat will assess the completeness/relevance of the risk management matrix and report the results to the MRC governance bodies.

Table 9.5. Risk matrix and mitigation measures for annual review and updating by JC

Risk	Category	Strategic Priority	Mitigation measures
Mekong Basin wide risks, as identified in Section 4.5 of the BDS			
1. Sufficient trust and confidence may yet not materialize among all parties to implement basin-wide proactive planning and transboundary cooperation on basin operations	M	All	<p>There is no easy remedy for insufficient trust: it comes with regional (economic) integration to which this BDS/MRC SP contributes.</p> <p>Development of political commitment of the basin countries and technical and diplomatic skills of the leadership within the MRC and MLC Water to drive a practical process towards achieving this BDS/MRC SP aims. Impartial political/technical leaders could be considered to help facilitate consensus when needed.</p> <p>Output 5.1.2 on MRC strengthening, Output 5.2.3 on strengthening dialogue and partnerships</p>
2. Loss of lives and infrastructure in urban and industrial areas of the Mekong Delta due to the lack of coordinated investment in flood protection	H	3, 4	<p>Assessment of alternative basin-wide development scenarios under Output 3.1.1 and subsequent trade-off and benefit sharing discussions, leading to the update of the flood and drought management strategy under Output 4.2.2.</p>
3. Insufficient increase in inter-seasonal water storage to keep up with increasing water uses in a future climate with dryer dry seasons, increasing water shortages and salinity intrusion	M	3	<p>Planning for inter-dependent development of storage and further consumptive uses in the basin, and the sharing of the resulting dry season flows - Output 3.1.1.</p>
4. Loss of livelihoods and food security in poor resource-dependent communities, exacerbated by gender inequalities , before economic development gradually lifts them out of poverty and accommodates change in livelihoods	H	2, 3	<p>Guidance for avoidance, minimization and mitigation of adverse impacts of infrastructure projects - Output 1.1.2.</p> <p>Planning for postponing or relocation of projects with large negative impacts as often such projects are also economically unattractive - Output 3.1.1</p> <p>Policies and programmes for alternative livelihood programmes - Output 2.2.1.</p> <p>Mekong Fund mechanism for adaptation to changes – activity 5.2.3.5.</p>
5. Stranded hydropower projects because electricity supply runs ahead of demand, or lower than anticipated dry season flows, or expansion of new technology, leading to unreliable, loss making hydropower projects and higher electricity costs for consumers	M	3	<p>Harmonization between water and energy sector planning and the development of hydropower in storage-backed cascades - Outputs 3.1.1, 3.2.2.</p>
6. Critical loss of remaining wetland and floodplain habitat reducing ecosystem services, such as flood absorption and fish habitat, and impacting vulnerable communities	H	1, 3	<p>Setting and implementation of limits of acceptable change - Output 1.3.1.</p> <p>Regional planning and a whole-of-landscape approach - Output 3.1.1.</p>

Risk	Category	Strategic Priority	Mitigation measures
7. Higher future cost of water security projects due to ongoing and planned infrastructure developments in areas and locations that may be needed in future for (joint) projects to build climate resilience and manage flood and drought risks	H	3, 4	Planning to identify these areas as well as the scope of such future projects, followed by spatial planning reservation - Outputs 3.1.1, 4.2.2.
8. Higher cost of riverbank and coastal protection and other costly measures to address the impact of sediment starvation	H	1, 3	Preparation and agreement on the implementation of a basin-wide sediment management strategy - Outputs 1.2.1, 3.1.1.
9. Larger impacts of water-related accidents and operations due to accidental spills of toxic substances, dam breaks, and uncoordinated hydropower operations	H	4, 5	Coordination of basin management operations through operation, communication and data sharing protocols - Output 4.2.2 Preparation and agreement on communication protocols for emergency response - Output 4.2.1.
Organizational risks, specific to MRC, as identified in MRC SP Section 9.6			
1. MRC's expertise & impartiality are not valued in the region. Without its position of trust and impartiality with Member Countries, MRC cannot not deliver its Strategic Plan	H	5	Improved communication of the MRC's mandate & work, improved engagement with wider stakeholder groups, and strengthened quality of MRC products MRCS will more often publicly address unbalanced, biased and incorrect statements and journalism in social and other media with factual and even-handed information
2. Coordination and inputs to the preparation and implementation of national development plans are insufficient to improve regional outcomes. If national development plans are not sufficiently informed by basin planning, they will remain sub-optimal for all Member Countries	H	5	Building 'uptake' into the multi-year work plans and NIPs and tracking of Impact pathways by MRC's M&E system. Most Outputs in Sections 8.2-8.6. Greater involvement of national line/implementing agency staff through joint basin expert groups in the preparation and implementation of work plans
3. There is difficulty in reaching consensus among Member Countries on critical issues. Resolving differences by mutually satisfactory solutions remains an ongoing challenge for MRC. Failure to manage this risk will jeopardize Member Country commitment to the MRC	H	3.5	Proactive regional planning that goes beyond what countries are currently planning The development of in-house (MRCS) and Council/JC's water diplomacy capacity to enable MRC to act as an honest facilitator Levering partnerships with MLC, ASEAN and other (multilateral) organisations

Risk	Category	Strategic Priority	Mitigation measures
4. There is difficulty in effectively implementing the MRC's cooperation mechanisms. There is a risk that MRC cooperation mechanisms, Procedures, strategies and guidelines are not implemented effectively because the mechanisms and quality of MRC products does not meet the needs or are not understood	H	5	<p>Updating of the five Procedures for the new basin realities and needs</p> <p>Building 'uptake' into the multi-year work plans and tracking of Impact pathways by MRC's M&E system.</p> <p>Strengthening and empowering joint basin expert groups and their national line/implementing agencies</p>
5. There are limited resources and capacity at national level to implement MRC's decentralised activities. Any significant gaps in the basin-wide knowledge base and deficiencies in institutional mechanisms for engaging in basin planning in some countries will adversely affect the value for all Member Countries	H	5	<p>Implementation of an organizational development and capacity plan to strengthen the MRC and enable continuing, gradual decentralisation</p> <p>Strengthening of Joint basin expert groups with representatives of national line/implementing agencies</p> <p>Development of institutional mechanisms for national implementing agencies to integrate basin planning and management in their staffing and workplans</p> <p>Leveraging partnership and support from partners</p>
6. Bureaucratic implementation of the MRC SP. Important MRC SP activities may not be adequately elaborated into informative concept notes and/or Terms of References, and therefore not adequately resourced and implemented. This lack of focus on Outcomes has hampered 'uptake' of Outputs	H	5	<p>The results chain in this MRC SP provides guidance for the resourcing and implementation modalities of activities.</p> <p>Strategic and technical coordination and oversight by the OCEO will be strengthened, which would be helped by an updated MRCS structure more aligned with MRC core functions</p> <p>A practical integrated system for multi-year work planning and budget and activity performance monitoring will be set-up. See Section 9.3</p>
7. There is significant unexpected funding shortfall. While the likelihood may be low, failure by MRC Member Countries and/or Development Partners to deliver on prior commitments would have a significant adverse impact for achievement of the Plan.	M	5	<p>Prioritization of activities for Outputs with high relevance in the in the multi-year work planning process according to agreed criteria. Sections 9.3 and 9.4</p> <p>Implementation of a fund mobilization strategy by the CEO</p>
8. Financial management and independent control does not ensure transparency and accountability. MRC needs to achieve and maintain a high level of credibility in both procurement and financial management areas to secure sufficient MRC SP funding based upon a Basket fund model	M	5	<p>An independent Audit function will continue, as will implementation of all updated manuals including Finance Manual.</p>

9.6 Monitoring, evaluation and reporting

MRC's results-based monitoring and evaluation framework is summarized in Table 9.2 below. It combines the basin monitoring system (see section 6.5) and the organizational M&E system. The latter also tracks the contribution of national agencies (through monitoring of NIP implementation) and other regional cooperation mechanisms to the achievement of BDS Outputs and Outcomes, based on the regularly updated BDS alignment table in Annex 1.

MRC's basin monitoring system comprises of a dashboard traffic light and trend display of the BDS Outcomes and their contributions to relevant SDG targets. The Outcomes and SDG contributions will be assessed in the SOBR, which is updated every 5 years. The SOBR records and evaluates the development impacts, positive and negative, within the Mekong River Basin as a measure of the effectiveness of the implementation of the BDS. The SOBR quantifies the strategic and assessment indicators of the MRB-IF and, as described in Section 6.5. The next update, which also evaluates the contributions to SDG targets, is in 2023.

MRC's organizational M&E system monitors and evaluates the implementation of this Strategic Plan in terms of inputs, activities, key deliverables, expenditures and Output indicators. The system monitors implementation progress against milestones and flags issues and concerns to the regular senior management meetings. Mid-year and annual reports are the main communication channels for monitoring, which is conducted internally by the lead divisions under the coordination of the MRCS OCEO's M&E team. A team of independent external experts will be engaged for the assessment of the Output indicators and deliverables and the overall MRC SP implementation, including cost effectiveness at mid-term of the five-year MRC SP cycles. The evaluation feeds into the next Strategic Plan that will be prepared in 2024 to contribute to the remaining BDS for 2026-2030.

Table 9.6. Monitoring and evaluation framework for BDS and MRC SP

Issues of interest	Methodology	Parameters	Function
Contribution to implementation of SDGs	Five-yearly updating of the <i>State of Basin Report</i> (next 2023)	The SDG targets that are relevant to Mekong river basin management	SDG monitoring
BDS Outcomes & Outputs (Basin status and trends)	<i>Dashboard</i> which tracks progress towards Outcomes (see Section 6.5) and Outputs based on the 5-yearly updated <i>State of Basin Report</i>	Strategic and assessment indicators of the Mekong River Basin Indicator Framework (MRB-IF)	Mekong River Basin monitoring

Issues of interest	Methodology	Parameters	Function
MRC contributions to BDS Outputs and Outcomes (Results, interim Outcomes)	Assessment of the quality of the Output produced Level of benefits and change through MRC interventions Value for money/C&B analysis <i>MRC Annual Report, Mid Term Review Report</i>	Output indicators in MRC SP Table 9.3 MRC deliverables	Organizational Monitoring & Evaluation (internal & external)
MRC tasks implementation (for activities and deliverables)	<i>Dashboard</i> that tracks progress against deliverables and flags issues to management <i>MRC Annual Report, MRC Mid-Year Report</i>	MRC tasks Rolling multi-year work plan with deliverables, budgets, etc.	Organizational Monitoring
MRC Budgets and expenditures	Integrated with task implementation above <i>Mid-Year Report, Annual Report, External Audit Report</i>	Rolling multi-year workplan with budgets, cash flow planning Accrual accounting	Organizational Monitoring
Gender aspects	Verification of gender aspects reflected in relevant Outputs and activities implementation <i>MRC Annual Report, Mid Term Review Report</i>	Collected gender-disaggregated data Gender Output indicators for MRC	Organizational Monitoring & Evaluation (internal & external)
Contribution by others to BDS Outcomes and Outputs	Expert Group on Strategy and Partnership meeting <i>MRC Annual Report, Mid Term Review Report, MRC SP Completion Report</i>	Activities, projects and programmes listed	Organizational Monitoring & Evaluation (internal & external)

Output Indicators for MRC. The BDS Outcomes seek to describe the resulting end state that basin countries would like to see by 2030. Their achievement will be evaluated using the strategic and assessment Indicators of the MRB-IF. The Outputs, which would be implemented by all relevant actors including the MRC, are the immediate results necessary for producing one of the Outcomes through an identified impact pathway. This takes a more subjective survey-based approach to periodically assess the extent that Outputs have been taken-up and utilized and are influential in attaining BDS Outcomes. For the MRC, the Output indicators and their scheduled emergence are defined in Table 9.7 below. The indicators generally comprise two aspects:

1. A measure to signify that the Output has been delivered to the end user, for example the agreement or approval of a regional strategy or guideline by MRC governance bodies, through which relevant national line or implementing agency is consulted, which is relatively easy to assess.
2. A more subjective assessment of the quality of the Output that is contributed by MRC and the extent it has been taken up in the national governance and planning system, which is inherently more difficult to assess as they relate behavioural, policy and institutional change that typically occurs over a longer time frame.

Table 9.7. Defined BDS Output indicators for MRC

Strategic Priority 1: Maintain the ecological function of the Mekong River Basin		
Outcomes	Outputs (2021–2030)	Output indicators (2021–2025)
1.1 Adequate water flow and quality for a healthy environment and productive communities	1.1.1 Guidance for water flow and quality management implemented	<p>Indicator: Evidence of management actions being taken in response to notifications of relevant water flow and quality conditions</p> <p>Target: Management actions taken as needed</p> <p>Baseline: No management actions taken</p> <p>Assumptions: National governments are jointly committed and have the capacity to act in response to relevant flow conditions</p>
	1.1.2 Guidance and measures for impact mitigation of water infrastructure implemented	<p>Indicator: Evidence the PDG and TbEIA has been incorporated into national regulatory systems and has informed development of new hydropower and other relevant projects</p> <p>Target: All new hydropower or other relevant projects implemented consistent with the PDG</p> <p>Baseline: The PDG is not being used to guide new hydropower or other relevant projects</p> <p>Assumptions: There is sufficient political will and technical support to incorporate PDG principles and recommendations into national regulatory systems</p>
1.2 Sediment transport managed to mitigate bank erosion and maintain wetland and floodplain productivity	1.2.1 Basin-wide sediment management plan developed and implemented	<p>Indicator: Approval status of the basin-wide sediment management plan</p> <p>Target: Basin-wide sediment management plan approved by basin countries for implementation</p> <p>Baseline: No basin-wide sediment management plan</p> <p>Assumptions: National governments, private developers and industry cooperate in the provision of relevant data, information and site access.</p>

1.3 Ecosystem services from wetlands and watersheds ensured	1.3.1 Limits of acceptable change for key river and connected wetland habitats identified and implemented	<p>Indicator: Evidence that: 1) the identified limits of acceptable change are used in regional and national development planning processes; and 2) national management plans for relevant wetlands are updated based on the identified limits</p> <p>Target: At least 2 national wetland management plans have identified limits incorporated. Processes for proactive regional planning and at least one national plan are informed by the identified limits</p> <p>Baseline: No regional limits of acceptable change have been identified for key river and wetland habitats in the Mekong River Basin</p> <p>Assumptions: Agreement can be reached with national agencies on appropriate and implementable limits for key regional environmental assets, drawing on sufficient technical support, and they have enough technical and resource capacity to update national wetland plans, informed by relevant limits</p>
	1.3.2 A basin-wide planning and management framework for watersheds developed and implemented	<p>Indicator: Evidence that relevant national policies, laws and plans are aligned with the regional planning and management framework for watersheds</p> <p>Target: At least 1 national line/implementing agency in each country has aligned its regulatory and management systems with the agreed watershed management framework</p> <p>Baseline: No regional planning and management framework for watersheds</p> <p>Assumptions: National line/ implementing agencies take ownership and have sufficient technical and resource capacity to align their regulatory and management systems to the regional planning and management framework for watersheds</p>

Strategic Priority 2: Enable inclusive access and utilisation of the basin's water and related resources

Outcomes	Outputs (2021–2030)	Output indicators (2021–2025)
2.1 Strengthened water, food, and energy security for basin community well-being	2.1.1 Access and supply of safe water to people in vulnerable situations improved	Not applicable to the MRC
	2.1.2 Capture fisheries regulatory frameworks improved to support food security	<p>Indicator: Evidence of national government's improving their capture fisheries plans, policies, laws and institutional arrangements, and/or enhancing implementation</p> <p>Target: At least one national line/implementing agency in each country has modified or enhanced the implementation and enforcement of its regulatory and management systems to improve the sustainability of capture fisheries</p> <p>Baseline: Current country plans, policies, laws and institutional arrangements</p> <p>Assumptions: There is recognition at national, sub-national and local levels that existing capture fisheries arrangements or their implementation need to be improved, and there is enough technical and resource capacity to make improvements</p>
	2.1.3 Risks to capture fisheries productivity and diversity minimised to support food security	<p>Indicator: Evidence of effective fish passage design and operation in water infrastructure</p> <p>Target: All hydropower projects on the mainstream and key irrigation schemes have effective fish passage in place</p> <p>Baseline: Designs and recommendations as documented in technical reviews under the PNPCA and in follow-up through JAP; and baseline Joint Environmental Monitoring reports</p> <p>Assumptions: There are cost effective options available to improve fish passage and national governments and developers have sufficient incentive and resources to change their designs, where relevant</p>
	2.1.4 Gender and vulnerability aspects of basin water, food, and energy security addressed	<p>Indicator: Degree to which disaggregated data on relevant indicators of gender and vulnerability are being collected at sub-national level</p> <p>Target: Data for agreed indicators on gender and vulnerability collected and shared with the MRCS</p> <p>Baseline: No agreed gender and vulnerability disaggregated data collection and transmission in place</p> <p>Assumptions: National governments have sufficient resources to support collection of disaggregated data on gender and vulnerability</p>

2.2 Increased employment and reduced poverty among vulnerable people dependent on river and wetland resources

2.2.1 Alternative and sustainable livelihood strategies for poor, resource dependent communities impacted by water resources development and management prepared and implemented at national levels

Not applicable to the MRC

Strategic Priority 3: Enhance

mal and sustainable development of water and related sectors

Outcomes

Outputs (2021–2030)

Output indicators (2021–2025)

3.1 Increased economic growth of all basin countries from more proactive regional planning

3.1.1 The Basin Development Plan and associated national plans for water resources development are informed by the findings of a more proactive regional planning approach

Indicator: The degree to which the basin countries have discussed and agreed to the formulated basin-wide alternative development scenarios and assessment methodology and approach, and are contributing to the assessment of the scenarios

Target: Basin countries have agreed with the formulated basin-wide alternative development scenarios and the assessment methodology, and line/implementing agencies are engaging and contributing to the scenario assessment process

Baseline: No alternative development scenarios have been formulated and no assessment methodology prepared

Assumptions: Countries approve the concept/TOR for proactive regional planning approach and MRCS manages the proactive planning process well and keeps the basin countries in the driving seat for the entire process

3.2 Enhanced inclusive growth and sustainability in irrigated agriculture, hydropower, navigation, environment and fisheries sectors

3.2.1 Irrigated agriculture investments and associated measures implemented

3.2.2 Sustainable hydropower development strategy and related regional energy plans implemented in synergy

3.2.3 Basin navigation plans implemented in synergy

3.2.4 Regional environmental strategies and programmes implemented in synergy

3.2.5 Investment and associated measures to adapt to changes in fish populations and catch composition identified and implemented

Indicator: The number of regionally identified investments and measures taken up in national water-related planning

Target: At least 1 investment and 1 measure taken up in each of these 5 MRB water-related sectors

Baseline: No take up of investments and measures

Assumptions: National line/implementing agencies are pro-active in working with MRC to improve MRB water-related sector strategies to help identify and support implementation of investment measures

Strategic Priority 4: Strengthen resilience against climate risks, extreme floods and droughts

Outcomes	Outputs (2021-2030)	Output indicators (2021–2025)
4.1 Better informed and prepared basin communities against changing river conditions, and more frequent and severe floods and droughts	4.1.1 A core river monitoring network for the mainstream and remaining national river monitoring networks consolidated	<p>Indicator: The degree to which the core river monitoring network for the mainstream is operational, providing the data and information required by basin countries</p> <p>Target: The core river monitoring network for the mainstream is fully operational as designed and agreed among basin countries</p> <p>Baseline: Various fragmented monitoring networks and efforts, with unsustainable financial arrangements</p> <p>Assumptions: Sufficient technical and financial resources available to enable a comprehensive and integrated monitoring including alignment between national and core river networks</p>
	4.1.2 Integrated data and information systems for more effective basin-wide data management and sharing	<p>Indicator: The degree to which the MRC data and information has been upgraded to good international standards</p> <p>Target: Key stakeholders and users find the MRC data and information system much improved compared to the 2018 review</p> <p>Baseline: The critical review of the MRC data and information system by key stakeholders and users during the 2018 MRC SP Mid-Term Review</p> <p>Assumptions: The improvement activities will be closely coordinated with the upgrading of the MRC DSF</p>
	4.1.3 Compatible Decision Support Systems building on reinvigorated data, modelling, forecasting, and communication capabilities	<p>Indicator: The degree to which the MRC DSF has been upgraded to the latest DSS standards (as demonstrated by the national DSS's managed by HAI (Thailand) and HIC (Myanmar))</p> <p>Target: MRC DSF is upgraded that complies with international DSS standards and is compatible with other DSS's in basin countries</p> <p>Baseline: MRC DSF is dated with limitations for basin planning and operational management, and is not compatible with other DSS's in the region</p> <p>Assumptions: There is sufficient commitment and financial and other resources to support the reinvigoration of MRC's DSF to standards equivalent to the highest in basin countries</p>

	<p>4.1.4 Integrated basin-wide flood and drought forecasting and early warning</p>	<p>Indicator: The degree to which the services of improved basin-wide flood and drought forecasting and early warning system are being used by the responsible national agencies and other target users including vulnerable groups</p> <p>Target: RFDMC services and products are evaluated on average as at least 'highly satisfactory' by national agencies and other users (through a user satisfaction survey)</p> <p>Baseline: Regional flood and drought forecasting and early warning technology and services have gaps and are evaluated as not satisfactory</p> <p>Assumptions: There is capacity to increase and strengthen staff of the RFDMC and basin countries share sufficient data and information to improve accuracy and timeliness of forecasting</p>
	<p>4.1.5 Joint State of Basin Report</p>	<p>Indicator: The extent to which China and Myanmar collaborate in preparing the SOBR 2023 and data gaps in all basin countries have been addressed in accordance with the MRB-IF</p> <p>Target: Data, information and analysis from China and Myanmar are included in the SOBR 2023 and there are no substantial data gaps to implement the MRB-IF</p> <p>Baseline: Limited official data and information from China and Myanmar were made available for preparing the SOBR 2018 and substantial data gaps in all basin countries</p> <p>Assumptions: China and Myanmar are willing to contribute to the joint SOBR 2023 and there is sufficient recognition of the need to improve data collection, assembly and sharing with the MRCS across all basin countries</p>
<p>4.2 Better disaster management and adaptation to water resources development and climate risks</p>	<p>4.2.1 Coordinated water infrastructure operations for multiple benefits including gender and vulnerability sensitive disaster mitigation and management</p>	<p>Indicator: The degree to which dam operations data are being shared among basin countries</p> <p>Target: At least 1 dam cascade has a communication and data and information sharing mechanism in place to prevent and manage emergencies, taking into account identified needs of vulnerable groups, while a communication and data and information sharing cooperation mechanism for the mainstream is being considered by the basin countries</p> <p>Baseline: No mechanisms are in place</p> <p>Assumptions: Basin countries agree on the urgency to coordinate the operation of dam and flood protection infrastructure and are willing to address this issue at the national and transboundary levels</p>

4.2.2 Climate change adaptation, flood and drought management mainstreamed at national levels

Indicator: The degree to which the regional climate change adaptation needs are addressed through national sector strategies and plans; and regional flood and drought adaptation guidelines are being used at a national level

Target: 1 national sector strategy and plan from each member country being implemented consistent with regional recommendations and guidelines

Baseline: Limited uptake in national sector strategies and plans of measures to respond to regional climate change adaptation needs and regional guidelines

Assumptions: Relevant national agencies and other stakeholders see value in and have capacity to respond to regional adaptation needs in their planning and implementation systems

Strategic Priority 5: Strengthen cooperation among all basin countries and stakeholders

Outcomes

Outputs (2021-2030)

Output indicators (2021-2025)

5.1 Strengthened Mekong River Commission for more effective implementation of the Mekong Agreement

5.1.1 Implementation of the MRC Procedures enhanced

Indicator: The degree to which PNPCA and the JAP of mainstream projects are implemented

Target: All PNPCA and JAP of mainstream projects are effectively implemented

Baseline: PNPCA implemented with JAP initiated since 2018

Assumptions: Agreement can be reached between the Member Countries on JC Statement and JAP and the political will and capacity to implement them

5.1.2 Organisational development of the Mekong River Commission

Indicator: The degree to which the MRC Strategic Plan is efficiently implemented with strengthened MRC organisational capacity and national implementation of regional planning and management processes

Target: 75% of MRC SP key deliverables completed

Baseline: MRC decentralisation and reform agenda are partly on track and the MRCS (including RFDMC) systems, processes and performance have gaps and shortcomings as identified in the 2018 MRC operational review and the 2019 mid-term review

Assumptions: The MRC Member Countries can agree, on a relevant, forward looking, and practical organisational development plan

5.2 Increased joint efforts and partnerships for more integrated management of the entire river basin	5.2.1 Common understanding on the potential future institutional arrangements for entire basin management	<p>Indicator: The extent to which there is common understanding of the institutional options for managing the entire Mekong River Basin</p> <p>Target: Basin countries have similar views regarding the institutional basin management options, including the role of the MRC and MLC Water</p> <p>Baseline: There is no common understanding of the institutional options for managing the entire Mekong River Basin</p> <p>Assumptions: MRC and MLC Water governance bodies will oversee implementation of the institutional options study and political leaders will discuss the resulting policy paper</p>
	5.2.2 Significant joint investment projects and national projects of basin-wide significance and associated measures agreed based on consideration of trade-offs, benefit sharing and risks	<p>Indicator: The extent to which significant joint infrastructure and national projects of basin-wide significance and associated measures, are prepared</p> <p>Target: Preparation of 1 joint investment project and 2 national projects of basin-wide significance</p> <p>Baseline: No significant joint investment project identified</p> <p>Assumptions: Basin countries engage in high-level discussions on trade-offs and benefit sharing based on the results of proactive planning (under Outcome 3.1)</p>
	5.2.3 Mekong water-related cooperation mechanisms and relevant partnerships implemented in collaboration with countries	<p>Indicator: The degree to which the new and existing MOUs are implemented</p> <p>Target: All MOUs are implemented or amended</p> <p>Baseline: Some MOUs are not fully implemented</p> <p>Assumptions: Partners in the MoUs make sufficient time and resources available to implement agreed actions</p>
	5.3.4 Joint Basin Expert Groups	<p>Indicator: The status of the establishment and operations of the proposed joint basin expert groups</p> <p>Target: One Joint Basin Expert Group established and operational</p> <p>Baseline: No agreement to the concept for the establishment of joint basin expert groups available</p> <p>Assumptions: MLC Water actively supports the establishment of the joint basin expert groups with MRC</p>

5.3.5 Harmonised basin-wide stakeholder platform

Indicator: The degree to which key concerns of basin communities are being heard and addressed through basin-wide stakeholder platform, operating with consistent recording, reporting and impact tracking procedures

Target: All key MRC SP deliverables take into account stakeholders concerns and inputs

Baseline: Basin communities lack systematic and institutionalized mechanism to have access to timely information and contribute to decision making in the entire Mekong river basin

Assumptions: The basin countries and various regional organizations, initiatives, programmes and projects see the added value of increasing the impact of stakeholder engagement and addressing 'stakeholder engagement fatigue'



The above monitoring and evaluation framework support the preparation of various progress and performance reports that MRC needs to manage the implementation of the BDS, to demonstrate the benefits of regional cooperation on Mekong water resources, to report on achieving SDG, and other purposes. The reporting system is summarized and illustrated below.

Mid-Year Report: (total amount to be issued: 5) Once the first rolling multi-year work plan is approved by the Council, activity implementation will begin. Progress in implementing tasks (to implement the activities and delivering the planned deliverables (see Section 8.2 to 8.7) and expenditures will be reported every mid-year. The status of tasks will be assessed (on track or delayed) and issues and challenges will be reported to the Budget Committee and actions recommended to adapt the Multi-Year Work Plan.

Annual Report: (total amount to be issued: 5) Midway and at the end of each two-year work plan cycle, an Annual Report will be issued to report progress in terms of delivery of key deliverables and achievement of Output indicators, based on completion of tasks. The Annual Report will also include a section on financial status. The annual reports may include a section on the contribution of other regional cooperation mechanisms and partners to BDS Outputs. The final Annual Report (2025) will double as the MRC SP 2021-2025 Completion Report.

Mid-Term Review Report 2023 (total amount to be issued: 1): Half-way through the Strategic Plan implementation cycle (2.5 years), a Mid-Term Review will be undertaken by a team of independent experts to assess the achievement of the Plan so far, the synergy and challenges among the implementation units, the overall MRCS with Member Countries, and partners, as well as the resources spent and benefits received. Recommendations will be made to re-orient the SP to avoid possible risks for the remaining years and to achieve its most relevant deliverables, activities and indicators. Recommendations on indicator improvement can also be made at this review session. The review will also assess the contribution of other regional cooperation mechanisms to BDS Outputs and Outcomes.

Strategic Plan Completion Report 2025 (total amount to be issued: 1): The final AR 2025 will be expanded and double as the Completion Report for the MRC SP cycle, assessing the overall achievements under this MRC SP. To complete the report, the MRCS will work with Member Countries, partners and stakeholders to document successes and difficulties, through Outcome reflection workshops and interviews. The cost-effectiveness of the implementation will also be determined. The overall implementation process, the most significant changes and story-based practices that bring results (both positive and negative) can also be documented to serve as the MRC knowledge base.







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