



MEKONG RIVER COMMISSION

ANNUAL REPORT

2019

Part 1

Progress and Achievements

The Annual Report Part 1 is a Mekong River Commission Secretariat (MRCS) report on the key MRC achievements at the level of *outcomes* for the year 2019 regarding implementation of the overall MRC Strategic Plan 2016-2020 and Annual Work Plan 2019, and includes a summarized financial report. Part 2 presents detailed progress reporting on the Annual Work Plan 2019 in terms of *outputs* and *activities* under each outcome, as well as detailed financial reporting.

The MRC is funded by contributions from its Member Countries and development partners: Australia, Belgium, the European Union, Finland, France, Germany, Japan, Luxembourg, the Netherlands, Sweden, Switzerland, and the World Bank.

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ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
ARF	Administrative Reserve Fund (of MRC)
ASEAN	Association of Southeast Asia Nations
AWP	Annual Work Plan
BDP	Basin Development Plan
BDS	Basin Development Strategy
BF	Basket Fund
BFMS	Basin-wide Fisheries Management Strategy
CC	Climate Change
CEWA	Charoen Energy and Water Asia Co. Ltd
CNR	Compagnie Naturelle de Rhône
CRC	Cambodian Red Cross
CSO	Civil Society Organisations
DAE	Thailand Department of Agricultural extension
DAGAP	Data Acquisition and Generation Action Plan
DDPM	Department of Disaster Prevention and Mitigation
DLD	Department of Livestock Development
DMS	Drought Management Strategy
d/s	Downstream
DWR of MOENRE	Department of Water Resources of the Ministry of Natural Resources and Environment
EF	Earmarked Fund
EU	European Union
GHG	Greenhouse gas
GISTDA	Geo-Informatics and Space Technology Development Agency
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HMS of MONRE	Hydro Meteorological Service of the Ministry of Natural Resources and Environment
HPP	Hydropower Project
HR	Human Resources
HYCOS	(Mekong) Hydrological Cycle Observing System
IC	International Conference
IUCN	International Union for the Conservation of Nature
IWRM	Integrated Water Resources Management
JAP	Joint Action Plan

JCWG	Joint Committee Working Group
JEM	Joint Environment Monitoring
LMB	Lower Mekong Basin
LMC	Lancang-Mekong Cooperation
LMI	Lower Mekong Initiative
M&E	Monitoring and Evaluation
MAF	Ministry of Agriculture and Forestry
MAF	Management and Administration Fee
MAFF	Ministry of Agriculture, Forestry and Fisheries
MARD	Ministry of Agriculture and Rural Development
MASAP	Mekong Strategy and Adaptation Plan
MC	Member Country
MLC	Mekong-Lancang Cooperation
MONRE	Ministry of Natural Resources and Environment
MOU	Memorandum of Understanding
MOWRAM	Ministry of Water Resources and Meteorology
MRB-IF	Mekong River Basin Indicator Framework
MRC	Mekong River Commission
MRC-IF	MRC Indicator Framework
MRCS	Mekong River Commission Secretariat
MTR	Mid-Term Review
NCDM	National Committee for Disaster Management
NDMC	The National Disaster Management Committee
NGO	Non-Government Organisation
NMC	National Mekong Committee
NMCS	National Mekong Committee Secretariat
ODA	Official Development Assistance
OR	Operational Review
PBHPP	Pak Beng Hydropower Project
PDG	Preliminary Design Guidance
PDG2018	Preliminary Design Guidance 2018
PDIES	Procedures for Data, Information Exchange and Sharing
PLHPP	Pak Lay Hydropower Project
PMFM	Procedure for Maintenance of Flow on the Mainstream
PNPCA	Procedure for Notification, Prior Consultation and Agreement

PPCS	Viet Nam Provincial People's Committees
PWUM	Procedure for Water Use Monitoring
RBO	River Basin Organisation
REAs	Regional Environmental Assets
RFDMC	Regional Flood and Drought Management Centre
RID	Royal Irrigation Department
RSAT	Rapid Sustainable Assessment Tool
RSF	Regional Stakeholder Forum
SDGs	Sustainable Development Goals
SEAFDEC	Southeast Asian Fisheries Development on fisheries management
SEI	Stockholm Environment Institute
SHDS	Sustainable Hydropower Development Strategy
SOBR	State of the Basin Report
SP	Strategic Plan
TB	Transboundary
TbEIA	Transboundary Environmental Impact Assessment
TD	Technical Division
TRR	Technical Review Report
u/s	Upstream
US	United States
UN	United Nations
UNEP	United Nations Environment Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
XHPP	Xayaburi Hydropower Project

MESSAGE FROM THE CHIEF EXECUTIVE OFFICER



Dr. An Pich Hatda

It is my great pleasure to present the MRC's Annual Report for 2019. This year marked the achievement of several important milestones with regards to enhancing our regional and national capacities for sustainable basin development, strengthening regional cooperation among Member Countries, partners and stakeholders, improving the quality and timeliness of monitoring and communication of basin conditions and forecasts, and MRC's transition to a more efficient and accountable organisation. The ten success stories that are highlighted in this report represent many of the major accomplishments that together we made possible during this year.

Let me start by highlighting a number of issues which are highly critical and urgent for many people and communities in our region. The Mekong River's water levels in the middle of 2019 reached historic lows not seen for 60 years. This event, along with the extreme flooding of communities along the Mekong at the end of August 2019 from tropical storm PODUL, and the increasing number of droughts that occurred in many parts of the region in recent years, are ominous signs that our

region is facing increasing risk from extreme weather events. It is my hope that significant improvements in our regional hydrometeorological monitoring network and flood and drought forecasting systems will enable us to be better prepared to cope with these extreme events, thereby minimising if not avoiding the loss of lives and property, and the disruptions they cause to the environment and national economies. The expansion of the functions of the MRC's Regional Flood Centre in Phnom Penh to also include drought, and the approval of the Regional Drought Management Strategy will further enable us to overcome these challenges more comprehensively, ensuring the Mekong region and its people are more prepared, less vulnerable, and more resilient from the changing climate.

The year 2019 also saw progress in the preparation of the regional Environment Management Strategy to protect key environmental assets, and the Joint Environmental Monitoring Programme for mainstream hydropower dams. The pilot testing of the proposed JEM Programme monitoring approach in Xayaburi and Don Sahong hydropower dams will begin in 2020. These two important documents, along with the State of the Basin Report, which was completed and published in 2019, and other MRC Strategies and Guidelines will collectively provide continuing channels for the MRC Member Countries to work together effectively towards sustainable development of the Mekong River Basin.

We have also reached several milestones in 2019 with respect to strengthening cooperation and partnerships among the MRC Member Countries and between the MRC and its regional and international partners. The implementation of MRC Procedures has continued to improve the water diplomacy process in the Lower Mekong region. For example, the recent introduction and acceptance of innovative tools, such as the JC Statement and corresponding Joint Action Plan in the PNPCA PC process for proposed Mekong mainstream hydropower projects (Pak Beng and Pak Lay) has heightened cooperation among the Member Countries and ensured the PC process' on-time, deliberate, and action-oriented conclusion, as well as its use as an avenue for continuing engagement and monitoring on mainstream dams. We reached a new level of cooperation with our Dialogue Partners in the upper Mekong – China and Myanmar – with the MRC Council Visit to China, the signing of an MOU between Lancang-Mekong Cooperation Water Centre and the MRCS, and with MRCS granted regular observer-participant status in the Mekong-Lancang Cooperation Joint Working Group on Water Resources. The year also saw the strengthening of our strategic partnerships with other river basin organisations and international/regional organisations including bringing together various regional cooperation frameworks in the Mekong region for the very first time to discuss opportunities for improved coordination and collaboration. I am also very pleased to say that we have continued our stakeholder outreach efforts at a high level through forums, targeted meetings, press releases and information shared

through the MRC website, social media, and numerous outreach campaigns. These efforts certainly resulted in more engaged participation from the public and a wide range of stakeholders.

Year 2019 also signified our renewed efforts to strengthen our internal operations, systems, and processes including the underlying information management, modelling, communications, financial, and M&E systems. The financial and internal control reforms we have instituted, and which were later validated with the MRC passing the EU Pillar Re-Assessment in late 2019, further galvanized the confidence and commitment of our Member Countries and development partners in our ability to perform our functions in the most transparent, accountable, and cost-effective manner. The completion of our strategic initiative to comprehensively assess the state of our current data, modelling and forecasting systems, and produce a design concept for their reinvigoration is important progress in further strengthening knowledge creation and management as a regional knowledge hub.

As we enter the final year of the current strategic plan, I am very proud of the progress we have made. It will enable us to prepare a Basin Development Strategy 2021-2030 and MRC Strategic Plan 2021-2025 that will bring about a more sustainable Mekong. These achievements would have not been possible without the unwavering commitment and cooperation of the MRC Member Countries and our development partners, the vision of our national leaders, and the steady guidance of the MRC Council and the Joint Committee. Finally, I cannot be more appreciative of the dedication and hard work that the staff of the Secretariat have exhibited throughout the year, as in other years, in providing the exemplary support and contributions that are expected from them by the MRC Member Countries and the people of the Mekong region. Thank you and keep up the great work.

EXECUTIVE SUMMARY

The Annual Report covers the key achievements and progress of the Mekong River Commission for 2019, the fourth year of implementation of the MRC Strategic Plan (MRC SP) 2016-2020. The MRC SP identifies four key result areas, seven outcomes, 44 outputs and 169 activities to be implemented during its 5-year period. The status of implementation progress shows 77% of outputs 'on-track', 9% 'delayed', and 14% 'not yet started'. An assessment of the status of the seven outcomes in terms of progress and level of change shows four outcomes rated as 'almost certain' and three as 'possible'. Overall, the MRC is on track to achieve the desired level of progress and impact and to meet its commitments in the MRC SP.

The year 2019 saw significant achievements in all areas. Major initiatives were successfully completed as summarised in the key highlights below.

Key Highlights

Better informed Basin Planning and Decision-Making using the MRC State of the Basin Report

The MRC State of Basin Report (SOBR), a flagship product of the organisation and an integral part of its strategic planning cycle, was completed and published in July 2019. Based for the first time on the new Mekong River Basin Indicator Framework (MRB-IF), formerly MRC IF, that establishes a comprehensive and consistent set of indicators covering all aspects of Mekong basin development and management, the 2018 SOBR provides an overall picture of the state of the Mekong Basin in terms of its ecological health, the social and economic circumstances of Mekong countries and their people, and the degree to which the cooperation between the countries is enhancing these conditions. The third in its series, the report reflects progress in achieving the aims and commitments set forth in the 1995 Mekong Agreement, and identifies critical issues and development opportunities that MRC Member Countries (MCs) must consider when making corrective actions and updating the Basin Development Strategy during the next strategic planning cycle.

Drought Management Strategy as a Unified Regional Response to the Increasing Risk of Drought in the Mekong Basin

The MRC Drought Management Strategy for 2020-2025, a regional strategy that serves as a response of MRC MCs to the urgent needs of the region to address the increasing risk of drought, was completed and subsequently endorsed by the Joint Committee (JC) and approved by the Council in November 2019. With initial funding secured for its implementation, the regional strategy is anticipated to immediately lead to tangible outcomes in the Mekong region. These outcomes include: i) gaps in monitoring data and models are filled to support drought forecasting and early warning; ii) drought conditions and trends in the basin are accurately assessed; iii) knowledge and capacity of MRCS, NMCS, and MCs in identifying and implementing drought mitigation and adaptation measures are enhanced; iv) impact mitigation and collaborations implemented; and v) drought forecasts and early warnings are effectively disseminated. To the public, the approval of the strategy was timely, as it came at a time of historical low flow year in the Mekong. Press and social media coverage of the strategy announcement were extensive, raising the profile and pro-activeness of the MRC in addressing this urgent issue.

Advancing Regional Cooperation to identify and protect Environmental and Ecological Assets through the Environment Strategy

The preparation of the Environmental Strategy for the region reached a crucial milestone when the final draft for submission for the JC's endorsement and the Council's approval in 2020 was completed on November 2019. The strategy represents a cooperative regional environmental strategy in response to the need to protect environmental and ecological assets, including those providing ecosystem services in the basin. As this is the first strategy of its kind, it focuses on the protection and conservation of 12 prioritised environmental assets in the LMB due to their regional importance in supporting basin-wide processes or due to their transboundary nature. The Environment Strategy, formally referred to as the Mekong Strategy for

Basin-wide Environmental Management for Environmental Assets of Regional Importance in the Lower Mekong Basin, is anticipated to complement the MRC Member Countries' national strategies with respect to addressing common challenges and limitations posed – for example, by lack of data, capacity, and funding – leading towards the collective and comprehensive protection and restoration of all environmental and ecological assets of importance in the region.

Agreement on the Draft Joint Environment Monitoring Programme and Proposed Pilot Testing

Three years after its first presentation to the MRC JC in 2016, the Joint Environment Monitoring Programme (JEM) for Mekong Mainstream Hydropower Projects reached a turning point in 2019 when the MCs agreed on a final draft JEM Programme document during the regional meeting of the Expert Group on Environmental Management in May 2019. The agreement also covered the two pilot project proposals for Don Sahong and Xayaburi hydropower projects to test the monitoring approaches described in the Programme Document for hydrology and hydraulics, sediment and geomorphology, water quality, aquatic ecology, and fish and fisheries. With the JC taking note of its progress during the JC Meeting in September 2019 and with the GIZ technical and financial assistance funding also secured, preparation for implementation of the pilot projects was subsequently initiated with a kick-off of the inception phase in November 2019. This proposed regional monitoring programme aims to address the need to determine impacts, including transboundary impacts, of mainstream hydropower projects and to distinguish the project-specific induced changes to the basin from the cumulative basin-wide impacts of all other developments. Ascertaining impacts attributable to a specific project is crucial in identifying and implementing (through joint cooperation) appropriate adaptive management approaches for that project in order to avoid, minimise, and mitigate negative impacts including both localized and transboundary impacts.

Successful Conclusion of the PNPCA Prior Consultation of Pak Lay Hydropower Project

The six-month PNPCA Prior Consultation (PC) process for the proposed Pak Lay Hydropower Project concluded on schedule in April 2019 with the MRC JC issuing its agreed Statement for the necessary efforts to address and mitigate potential adverse cross-border impacts of the project. Equally important and unprecedented is the JC's approval of the Joint Action Plan (JAP) for the project on the same day, marking it as the first time the PC process concluded with formal agreements among the MCs at the end of its six-month period. The speedy conclusion of the process for the Pak Lay Hydropower Project, which is the fourth Mekong mainstream hydropower project to go through the PC process, demonstrates the increased confidence of the MCs on the mechanism of the Statement and the JAP to push for sustainable hydropower development in an open and inclusive approach. The JC Statement and JAP, which were introduced first with the Pak Beng Hydropower Project and now with the Pak Lay Hydropower Project, have elevated cooperation among the MCs during the PC process and ensured the process' on-time, deliberate, and action-oriented conclusion. While remaining largely based on the TRR, the proposed actions in the JAP provide the notifying country and hydropower developer flexibility to do what is right and reasonable throughout the life cycle of the project in an open, transparent, consultative, and adaptive manner to avoid, minimise, and mitigate negative impacts of the hydropower project.

Reaching New Heights in Cooperation, Partnerships and Stakeholder Engagement in the Mekong Basin

Year 2019 saw several milestones completed as part of MRC's commitment to promote and strengthen cooperation and partnerships not only among MCs, but also with its growing list of strategic and technical partners regionally and internationally. The year also signified increasing efforts of the MRC to intensify its stakeholder communications and outreach efforts, resulting in more engaged and effective participation from a broad range of stakeholders that included national civil society organisations and the public. The strategic cooperation between the MRC and China has reached a new level as highlighted by the renewal of China's agreement to share Lancang hydrological data, which began in 2002, the granting of the right to the MRC to attend as an observer-participant in meetings of the Mekong-Lancang Cooperation (MLC) Joint Working Group on Water Resources, and finally, at the end of the year, the signing of the MOU between

Lancang-Mekong Cooperation (LMC) Water Center and the MRCS. The year not only demonstrated the continued commitments of MRC's development partners but the strengthening of ongoing partnerships with other river basin organisations such as the Mississippi River Commission in the U.S., and the revitalization of longstanding partnerships such as that with the Murray-Darling Basin Authority in Australia. Finally, 2019 also saw the MRC bring together senior representatives from the Mekong countries and seven major Mekong regional cooperation frameworks for the first time to discuss and explore opportunities for improved coordination and collaboration. The organisations and cooperation frameworks that were represented include the ASEAN Secretariat, ADB (supporting the Greater Mekong Subregion Economic Cooperation Program), Ayeyarwady-Chao Phraya-Mekong Economic Cooperation Strategy, Mekong-Japan Cooperation, Mekong-Korea Cooperation, the Lower Mekong Initiative, and the MLC.

Monitoring, Forecasting and Dissemination of Basin Conditions, in the context of Low Flows, Floods, and Droughts

Monitoring and forecasting of hydrologic conditions in the basin have been a mainstay of the MRC's core services since its beginning, signifying its utmost importance and chronic need in the region and MRC's critical role in addressing that need. In early 2019, the Regional Flood Management and Mitigation Centre (referred to as the Regional Flood Centre), which was established in 2006, was renamed as the Regional Flood and Drought Management Centre (RFDMC) to accurately reflect the expanded scope of services and also to bring the increasing threat of drought in the region front and centre. This event signified MRCs' heightened efforts to address both flood and drought issues in the Mekong region in an integrated manner, taking advantage of the significant improvements in the capability of the Centre to provide faster and more accurate flood and drought forecasting and early warning information throughout the year to potentially impacted communities. Continuing improvements in 2019 included the upgrade, operation and maintenance of the supporting monitoring and communications infrastructure such as the Mekong-HYCOS hydrometeorological network; the near real-time monitoring, and flood and drought forecasting websites; the timely delivery of both routine and emergency monitoring and forecasting services by the RFDMC; and the development and dissemination of routine flood and drought products such as bulletins, reports, and advisories.

Towards Comprehensive Reinvigoration of MRC Data, Information, Modelling, Forecasting and Communication Systems

The Siem Reap Declaration by the Prime Ministers of the four Governments of the MRC MCs at the MRC Summit in 2018 called for strengthening of the MRC basin-wide monitoring networks and forecasting systems, and the data and information management systems underpinning them. This declaration came with the urgency and increasing recognition of the importance of these systems in enabling the MRC to successfully deliver its mandate. Year 2019 may ultimately prove to be the turning point when the organisation embarked on a deliberate path towards overhauling its information system to take advantage of modern advances in data, science, and technology, and more importantly, to enable the organisation to meet its current and foreseeable needs. The completion in 2019 of the strategic initiative to conduct an assessment of its current systems and to prepare a Design Concept for their reinvigoration is a significant first step. Moreover, specific enhancements of the current MRC data portal in 2019 as a result of MRCS staff's increased proactivity and resourcefulness addressed to some extent a number of the short-term recommendations in the Design Concept.

Strengthening Internal Controls in Support of a Transparent, Accountable, and High Performing Organisation

The year 2019 represents the achievement of several key milestones for financial and accounting reforms as part of strengthening its internal operations and as the MRC continues to transition into a leaner and more efficient organisation towards a financially self-sustainable organisation by 2030. These milestones notably include the establishment of an independent Audit Committee and the revisions of operations manuals (i.e., Administration, Finance, Procurement, and HR). The completion of these milestones have culminated in the MRCS passing the European Union (EU) Pillar Re-Assessment in November 2019, which provided reasonable

assurance to the European Commission and other development partners as well as MCs, that the MRC fulfils applicable requirements with regards to the assessed pillars: internal control, accounting, external auditing, and procurement. Equally important, if not even more meaningful, is that the strengthened internal operations and the subsequent specificity, clarity, and certainty it brings to the “rules” have resulted in encouraging changes at the staff level in terms of morale and productivity. These instances of isolated positive results are anticipated to increase substantially and become more ingrained in the culture of the organisation, thereby helping propel it to successfully transition to a leaner, more efficient, self-financed organisation capable of delivering its 1995 mandate in the most transparent, accountable, and cost-effective manner.

Dashboards developed in support of Organisational Performance and River Basin Monitoring

The increasing recognition of the importance of dashboards and visualisation tools, and how they can be applied to enhance MRC core services is evident in the number of initiatives and activities that were conducted in 2019. This flurry of initiatives and activities were encouraged by a combination of factors including the MTR recommendations, the benefits demonstrated by using dashboards for financial management, and the increase in the commitment of the organisation to strengthen its internal operations and its systems for M&E, information management, modelling, forecasting, and communications. These initiatives and activities included the completion of the system reinvigoration initiative, which produced a Design Concept that reinforced the need and importance of dashboard and visualization for effective data and information management, modelling, forecasting, and communications; the enhancements of the data portal specifically in the use of visualization tools for effective dissemination of forecasts; the completion and deployment on the MRC website of the interactive tool for the Council Study to communicate more effectively its findings and recommendations to a wider range of stakeholders; the completion of the national workshops participated in by MCs on Shared Vision Planning, which represents an approach and offers sets of tools, techniques, and case studies to facilitate a common understanding of the natural resources system and provides a consensus-based forum for stakeholders to identify trade-offs and management options; and finally, the completion of an M&E dashboard training for technical staff from NMCS, from which they produced dashboards for several key monitoring needs, including water level and discharge monitoring data in Cambodia, Nam Ngum reservoir operation in Lao PDR, salinity intrusion in Viet Nam, reservoir storage volumes in Thailand, and enhanced financial performance monitoring for the MRC.

Financial Highlights

2019 was an exciting year; significant fluctuations in income and expenditure against the budget was recorded. The MRC received a total income of USD 12,242,948, which consisted of USD 6,910,954 for the Basket Fund (BF), USD 5,240,494 for the Earmarked Fund (EF), and USD 91,500 for the Administration Reserve Fund (ARF). On the expenditure side, the total for the year was USD 11,754,724, which included USD 7,156,856 for the BF, USD 4,497,287 for the EF, and USD 100,581 for the ARF. As a result, the movement in fund balance for 2019 was USD 488,224.

The opening fund balance on 1 January 2019 was USD 8,673,272, which is carried from the previous year. The total budget (AWP) for 2019 was USD 16,568,932. Disbursement rate was therefore 71%. The disbursement rate for 2019 would increase to 83% if obligated contracts and cash advances, at the amount of USD 1,915,450, were included.

In line with the roadmap for self-sustainability, MCs increased their financial contribution year by year. In 2019, total contribution from members was USD 3,420,348, compared to USD 3,109,406 in 2018. Besides, in 2019, the MRC received a total of USD 8,174,995 from development partners, compared to USD 5,021,943 at the end of 2018.

INTRODUCTION

The MRC Annual Report 2019 is the fourth annual report in the 5-year MRC Strategic Planning cycle, 2016-2020. The Annual Report highlights the key achievements of the MRC in 2019 as well as reports on the progress of outputs and activities set out in the MRC SP and the Annual Work Plan (AWP) 2019.

The Annual Reporting process is divided in two parts.

Part 1 – this report – reports at the level of outcomes for the year in the implementation of the overall MRC SP 2016-2020 and its Annual Work Plan for 2019, and includes a brief financial report summary.

- **Outcome reporting:** Showcases the outcomes which contain “evidence of change” (in awareness or knowledge, in behaviour or action, in policy or planning) in each of the MRC SP’s seven Outcomes (see below), as measured by their indicators. Outcome indicators were selected based on where evidence of change could be observed that occurred during 2019 – not all outcome indicators are reported as this part aims to highlight the indicators of success stories. Progress of all indicators are reported in Part 2.
- **Financial summary:** Summarises the MRCs financial performance in terms of actual expenditure compared to the forecasted budget in the Annual Work Plan 2019, and a comparison with the financial performance of the previous year, 2018.
- **Outcomes status:** Provides a report card on the status of the seven outcomes in the MRC SP 2016-2020 through an assessment of the likelihood of achieving the outputs identified to deliver on the outcome by the end of 2020 and the impact of the change when an output has been achieved. The report card also identifies key actions that should be undertaken to improve performance and increase the likelihood of achieving the outcomes.

Part 2 – a separate report – presents detailed progress reporting on implementation of the Annual Work Plan 2019 in terms of outputs and activities under each outcome, as well as detailed financial reporting.

- **Progress reporting:** This is presented in different annexes in which the progress of delivering each output under each outcome is reported in terms of completion of its activities (as planned in the AWP for the year), the percentage of progress of that output (against the 5-year MRC SP), and implementation status in terms of being “on track” or “delayed”. In addition, reports on the indicators of each output are provided, showing the rating and status at the end of the reporting year.
- **Financial reporting:** Detailed income and expenditure for the year by Basket and Earmarked funds.

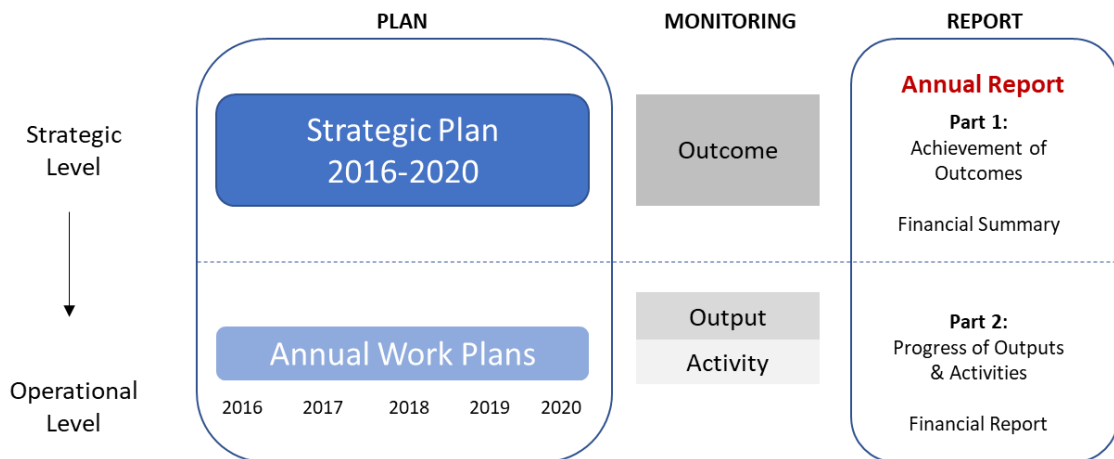


Figure 1: Relationships between SP, AWP & the Annual Report

MRC and its Strategic Plan

The mission of the **MRC**, established by the **1995 Mekong Agreement** between the governments of Cambodia, Lao PDR, Thailand and Viet Nam, is to promote and coordinate sustainable management and development of water and related resources in the Lower Mekong River Basin for the countries' mutual benefit and the people's wellbeing. Under the MRC framework, the countries cooperate in all fields of sustainable development, utilisation, management and conservation of the water and related resources of the Lower Mekong River Basin including, but not limited to: irrigation, hydro-power, navigation, flood control, fisheries, etc., in a manner that optimises the multiple-use and mutual benefits of all riparian's and to minimise harmful effects.

For 2016-2020, the **MRC SP** identifies 4 Key Result Areas, 7 Outcomes, 44 Outputs and 169 Activities to be implemented over 5 years. The MRC SP addresses the priorities identified in the Basin Development Strategy 2016-2020 at the regional/basin level. The National Indicative Plans 2016-2020, one for each country, address the BDS priorities at the national level through joint projects¹, national projects of basin significance, national activities, and decentralised activities.

Overall, the MRC strives for the following results and outcomes:

<p>Key Result Area 1: <i>Enhancement of national plans, projects and resources based on basin-wide perspectives</i></p>	<p>Outcome 1: Increased common understanding and application of evidence-based knowledge by policy makers and project planners</p> <p>Outcome 2: Environment management and sustainable water resource's development optimised for basin-wide benefits by national sector planning agencies</p> <p>Outcome 3: Guidance for the development and management of water and related projects and resources shared and applied by national planning and implementing agencies</p>
<p>Key Result Area 2: <i>Strengthening regional cooperation</i></p>	<p>Outcome 4: Effective and coherent implementation of MRC Procedures by the Member Countries</p> <p>Outcome 5: Effective dialogue and cooperation between Member Countries and strategic engagement of regional partners and stakeholders on transboundary water management</p>
<p>Key Result Area 3: <i>Better monitoring and communication of the Basin conditions</i></p>	<p>Outcome 6: Basin-wide monitoring, forecasting, impact assessment and dissemination of results strengthened for better decision-making by Member Countries</p>
<p>Key Result Area 4: <i>Leaner River Basin Organisation</i></p>	<p>Outcome 7: MRC transitioned to a more efficient and effective organisation in line with the Decentralisation Roadmap and related reform plans</p>

¹ Joint projects are projects between two member countries that address transboundary issues.

Annual Work Plan 2019 Implementation: Progress, Achievements and Challenges

To achieve the seven outcomes of the MRC SP 2016-2020, the Annual Work Plan for 2020 committed to implementing 36 outputs, with a budget of USD 16,568,932 and an expenditure of USD 11,754,724, resulting in a disbursement rate of 71%. The disbursement rate for 2019 would increase to 83% if obligated contracts and cash advances, at the amount of USD 1,915,450, were included. The total income received was USD 12,242,948, plus USD 8,673,272 carried over from 2018, resulting in total funds of USD 20,916,220 being available for 2019, inclusive of the Administrative Reserve Fund of USD 4,439,702.

2019 saw major achievements under each of the seven outcomes, which are highlighted through the stories of change in this report.

The MRC is interested in measuring and reporting not only the progress of an output, but also the level of change or impact the activity has produced. Figure 2 and Figure 3 show this pathway of change diagrammatically. An activity may lead to short-term change and building of awareness which is a good result; however, the ultimate goal is where a long-term sustainable impact occurs through the adoption of important data-sharing protocols, information, strategic priorities, or models (as examples) into the development and implementation of regional and national policies, plans, strategies, legislation and cooperation mechanisms.

In achieving long-term change, the MRC can then be more certain that it is achieving its mandate of sustainable management and development of water and related resources of the lower Mekong River Basin for the countries' mutual benefit and the people's well-being.

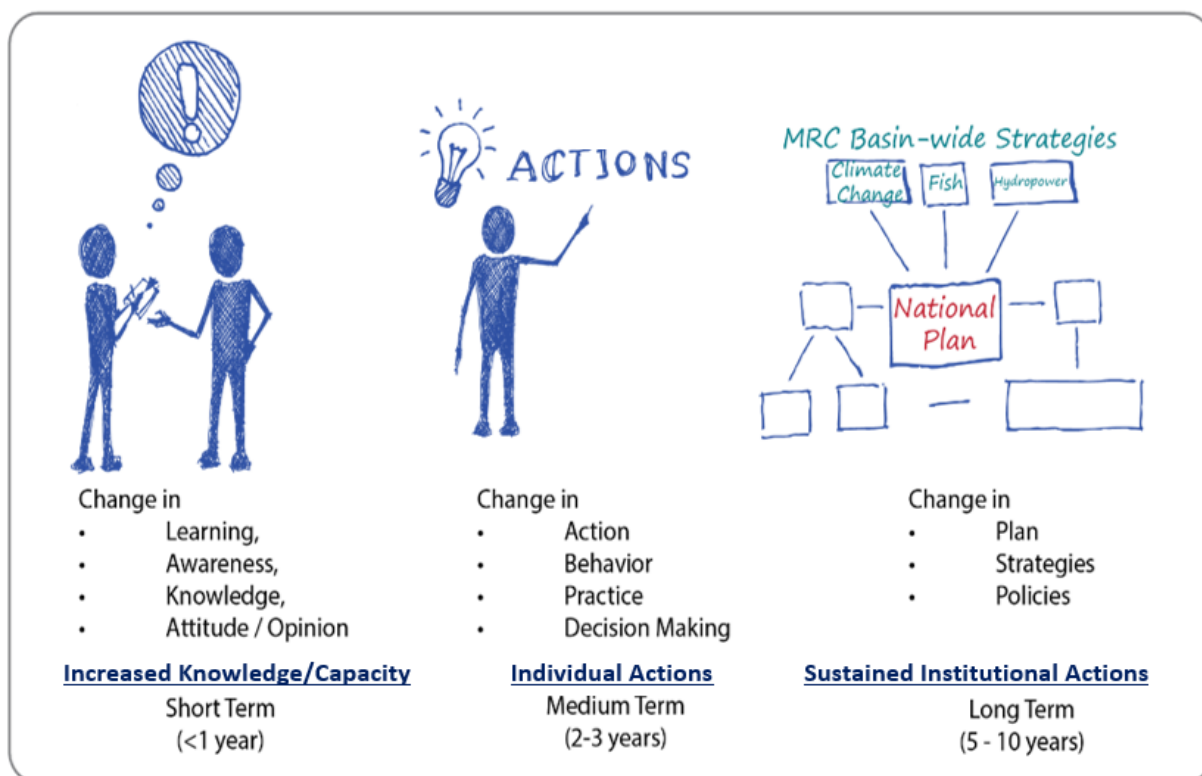


Figure 2: Types of change

Pathway to Change

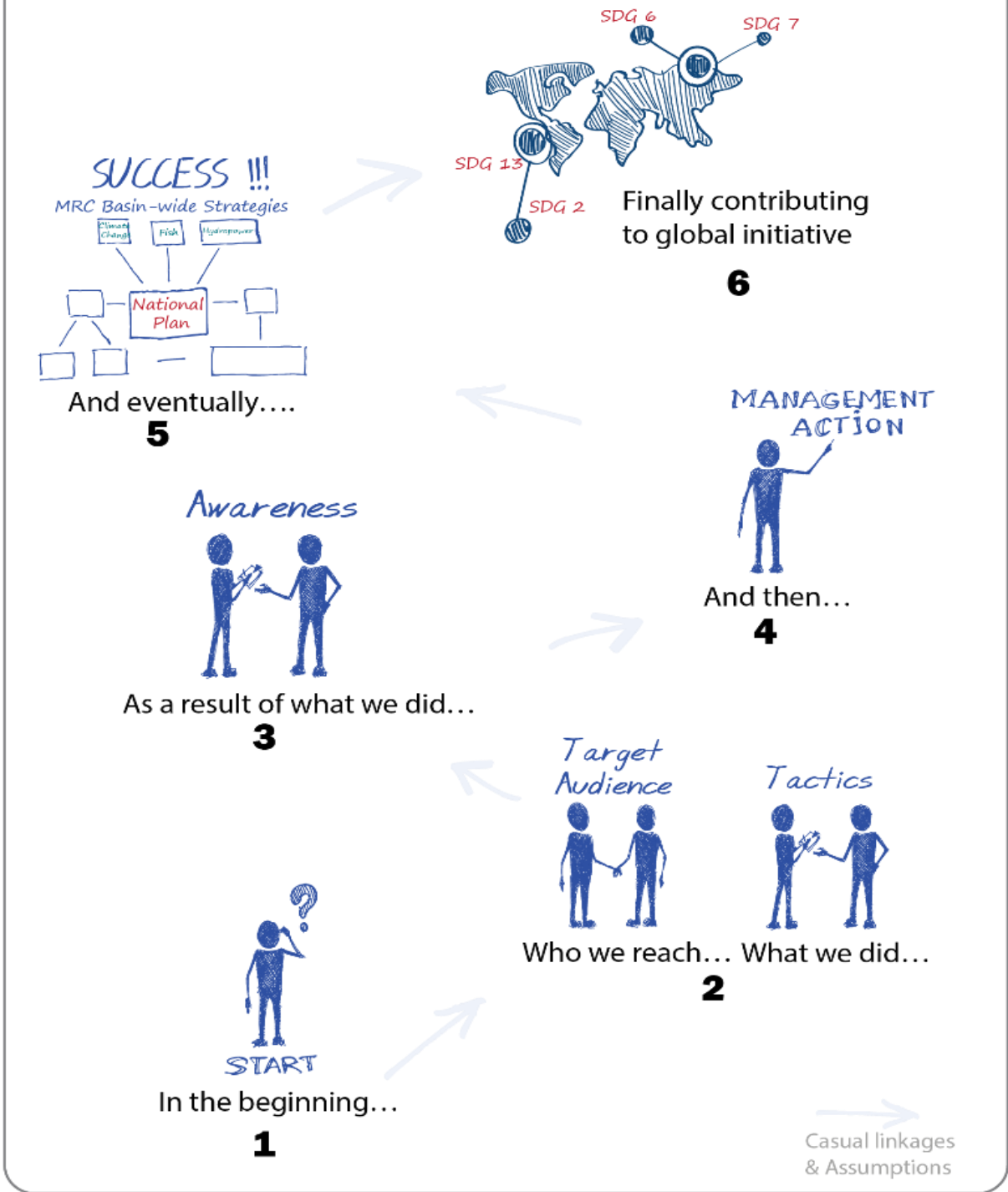


Figure 3: Pathway to change

Strategic Plan 2016-2020

Summary:
 Total MRC SP 2016-2020 Output: 44
 Delayed: 4
 On track: 34
 Not yet started: 6

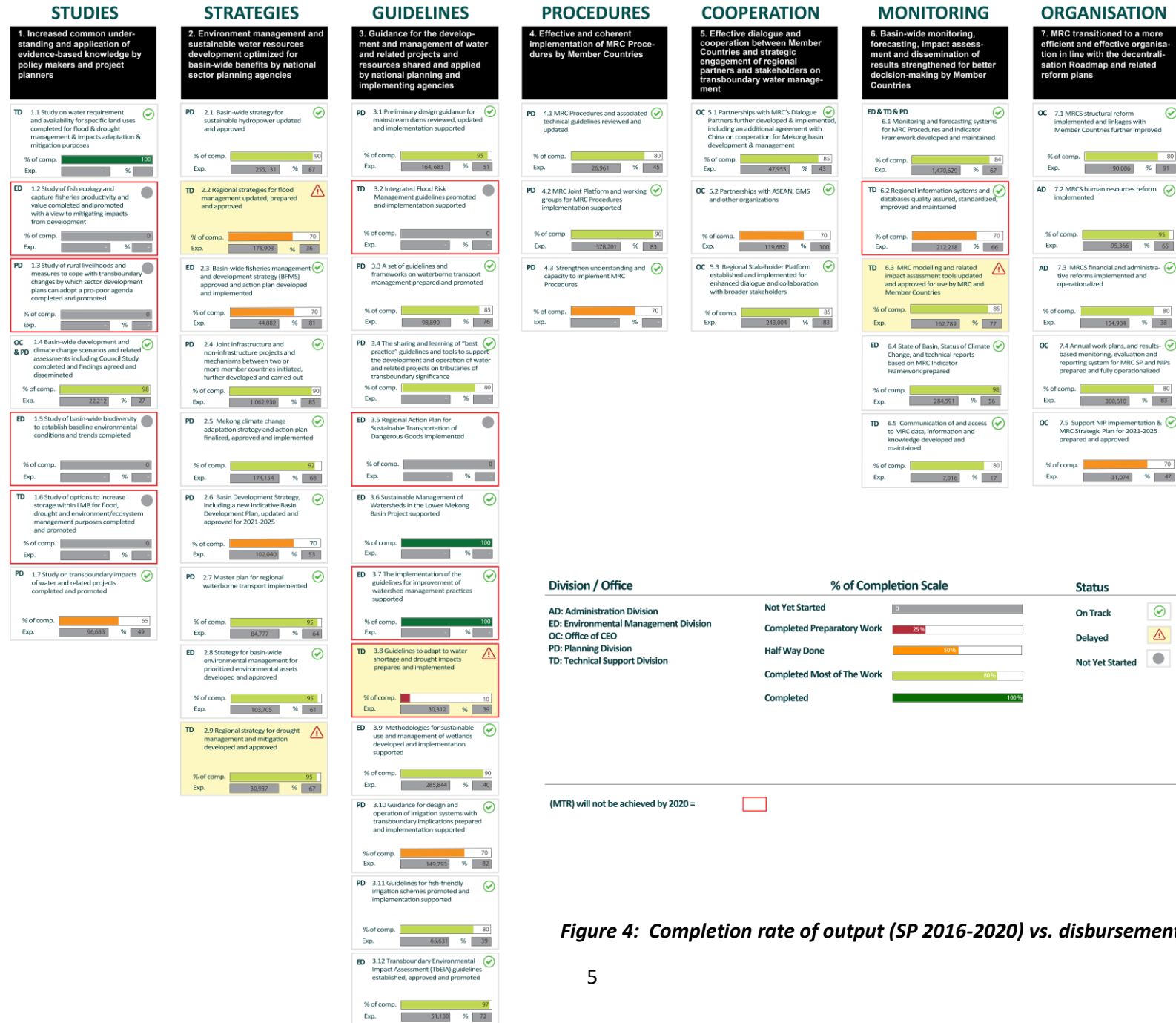


Figure 4: Completion rate of output (SP 2016-2020) vs. disbursement rate in 2019

In addition to assessing the progress of outputs planned for in the AWP 2020, an assessment was also undertaken to determine the overall status of the MRC's seven outcomes. To guide this assessment, an Outcome Evaluation matrix was applied based on the progress for each output in the MRC SP and the type of change an output has achieved so far. The output progress was given a status category from high to low: 'on-track', 'not yet started' and 'delayed'. The type of change an output achieved was assessed from high to low based on type of change: plans, policies and conditions; behaviour, practice or decision-making; or knowledge, awareness and opinion.

Using the results of the assessment of the outputs for each Outcome, an overall status was then determined as:

- 'Almost Certain': change is expected to occur;
- 'Possible': change is expected to occur but significant effort is necessary to achieve influence; or
- 'Unlikely': change is not expected but may occur if critical issues are resolved.

Part 2 of this report includes the Outcome Status Summary for each outcome and its supporting outputs with detailed commentary on progress with outputs and challenges that were experienced. Recommended actions are also made to improve progress and/or increase the level of change of an output to ensure the outcome delivers by the end of the MRC SP 2016-2020. Suggestions are also made where outputs should be discontinued or implemented through the next MRC SP planning phase.

The Report Card (Table 1 below) provides a snapshot of the Outcomes status for 2019 and identifies key actions that are necessary to improve the status of each outcome through implementation of the Annual Work Plan 2020. An assessment is then made of the expected result from implementing these actions by the end of 2020.

At a regional scale, the MRC in addressing basin-wide needs, challenges and opportunities contributing to the United Nations (UN) Sustainable Development Goals (SDGs). The MRC's activities directly link to the following SDGs: Goal 1: No Poverty, Goal 2: Zero Hunger, Goal 5: Gender Equality, Goal 6: Clean Water and Sanitation, Goal 7: Affordable and Clean Energy, Goal 9: Industry, Innovation and Infrastructure, Goal 12: Responsible Consumption and Production, Goal 13: Climate Action, Goal 15: Life on Land and Goal 17: Partnerships for the Goals. Figure 5 illustrates in detail the linkages between the MRC's outcomes and outputs and the SDGs and relevant targets.

Following the section on SDGs, the most significant achievements and stories of change in 2019 are provided through key outputs undertaken to progress the MRCs important work on the development and implementation of its studies, strategies, guidelines, procedures, cooperation mechanisms, monitoring, and organisational matters.

Table 1: Report card on Outcome Status for 2019

Outcome Status as of December 2019								
	Outcome 1: Studies	Outcome 2: Strategies	Outcome 3: Guidelines	Outcome 4: Procedures	Outcome 5: Cooperation	Outcome 6: Monitoring	Outcome 7: Organisation	
Likelihood of the output producing	Almost Certain	2	7	6	2	3	3	5
	Possible	1	2	1	1	2	2	5
	Unlikely	4		5				
Total # of Outputs under each outcome	7	9	12	3	3	5	5	
Outcome Status	Unlikely	Almost Certain	Possible	Almost Certain	Almost Certain	Almost Certain	Almost Certain	
Key Actions to improve Outcome Status based on the Annual Work Plan 2020	Continue to take into account the Council Study results when formulating/updating sectoral strategies. Its national uptake plans will have to be finalized within the context of the national uptake guidance. An agreement for the next steps for the de-prioritized outputs 1.3.,1.5. and 1.6 should be reached and in lieu, take advantage of the relevant aspects already covered by the Council Study.	Seek approval of outstanding strategies and initiate/continue implementation of action plans. Integrate top priorities of sectoral strategies and action plans in BDS 2021-2030 placing emphasis on promoting national uptake and integration with national systems.	Seek approval of draft guidelines such as PDG and for Waterborne Transport. Examine outstanding outputs and determine whether to postpone for the next strategic planning cycle. Focus on ensuring the national and regional use of the existing guidelines and standards including the implementation of RSAT and the Waterborne Transport guidelines.	Focus on implementing the JAPs for Pak Beng, Pak Lay and Luang Prabang hydropower projects. Improve the MRC procedures, such as PDIES, PWUM and PMFM. Continue to strengthen MRC's capacity to implement all Procedures including water diplomacy.	Continue MRC's efforts in promoting and strengthening stakeholder participation and partnerships and collaborations including more specifically the implementation of the MOUs with China, and other partners, and also the implementation of MRC regional cooperation framework.	Deploy the new enhanced version of the data portal. Begin preparation of the implementation plan for the systems reinvigoration. Continue to maintain the operation of the Mekong-HYCOS at a high level and to deliver quality and timely flood and drought forecasting services. Output 6.3 will be expedited in 2020.	Continue to strengthen the MRC's Expert Groups including their role in promoting national uptake. Continue to strengthen MRC's internal operations including resolving a number of functional issues relating to the current financial software. Expedite fund raising to secure funding for SP 2021-2025.	
Expected Results from implementing the Annual Work Plan 2020	Almost Certain	Almost Certain	Almost Certain	Almost Certain	Almost Certain	Almost Certain	Almost Certain	

Enhancing Joint Efforts and Partnerships towards Achievement of the SDGs in the Mekong River Basin

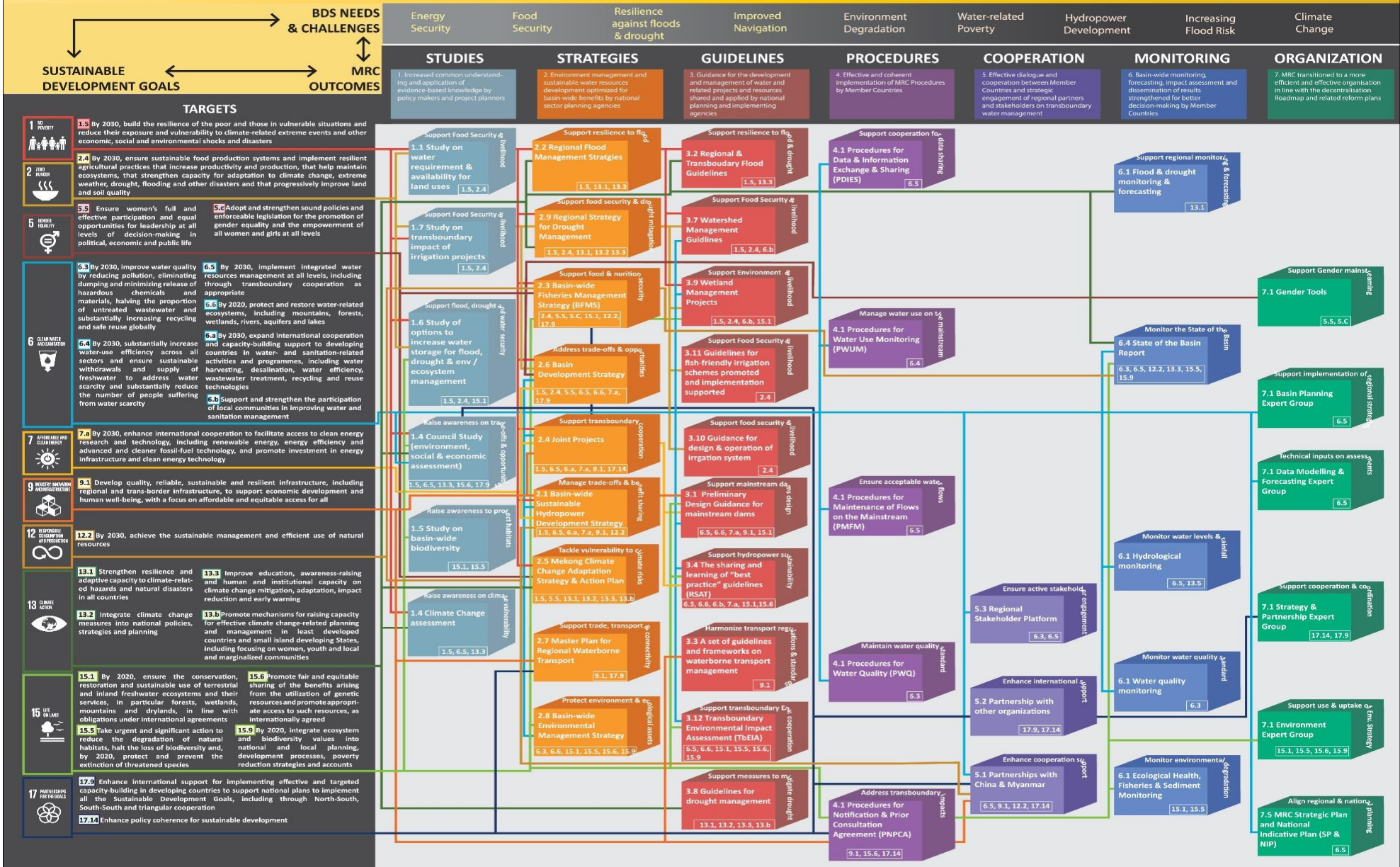


Figure 5: Linkages between the MRC's outcomes and outputs, and the SDGs and relevant Targets



ACHIEVEMENTS

OUTCOME 1

Better informed Basin Planning and Decision-Making using the MRC State of the Basin Report

INDICATORS:

- Evidence of national and regional decisions made based on or referring to MRC knowledge products
- The extent to which Line / Implementing Agencies use MRC reports and information systems for better decision-making (Outcome 6)*

The MRC State of Basin Report (SOBR) is a flagship product of the organisation and an integral part of the organisation's strategic planning cycle. Envisioned to be published every five years to coincide with the MRC's 5-year strategic planning cycle, the SOBR aims to provide an overall picture of the state of the Mekong Basin in terms of its ecological health, social and economic circumstances of the Mekong countries and its people, and the degree to which cooperation between riparian countries envisaged under the 1995 Mekong Agreement is enhancing these conditions. As part of the strategic planning cycle, the SOBR is intended to reflect on the aims and commitments of the 1995 Mekong Agreement, to determine progress towards achieving these aims, and to identify issues and development opportunities that the Member Countries need to consider when making corrective actions and updating the Basin Development Strategy for the next planning cycle.

In summary, the SOBR can be used to meet the following purposes:

- inform a broad audience on the social, environmental and economic status and trends in the Mekong Basin;
- record and evaluate the development impacts, positive and negative, within the Mekong Basin as a measure of the effectiveness of the implementation of the Basin Development Strategy;
- highlight arising development opportunities and issues which could be explored through scenario assessment, or need to be addressed in the next update of the Basin Development Strategy;
- provide decision makers with concise and relevant information on the issues they consider relevant in determining the benefits and impacts derived from basin- wide cooperation;
- provide relevant information on how well the MRC achieves its vision of "an economically prosperous, socially just and environmentally sound Mekong River Basin".

Completed and published in 2019, the 2018 SOBR is the third in the series but the first to be presented within the Mekong River Basin Indicator Framework (MRB-IF), formerly the MRC IF, a new framework based on a comprehensive and consistent set of indicators that address most aspects of Mekong River Basin management. These indicators cover five critical dimensions namely: environmental, social and economic conditions, climate change, and cooperation. In addition, and for the first time, the 2018 report includes a review of conditions within the Upper Mekong Basin, known as the Lancang Basin in China.

*Note: The preparation of 2018 SOBR is an activity under Outcome 6. For this annual report, it is presented under Outcome 1 as it represents the common knowledge and understanding of the Mekong Basin's current conditions and trends based on findings from MRC monitoring and numerous studies, including MRC studies such as the Council Study, which was completed in 2017.

PROGRESS

The 2018 SOBR, which is the third in the series of SOBR reports, was completed and published in July 2019. The first two reports were published in 2003 and 2010.

The completion of the SOBR involved the mobilization of significant MRCS staff and consultant resources, and extensive consultations with MCs over a three-year period beginning in 2016. This reflects the challenges in developing this version of the SOBR that represents a comprehensive and replicable approach to monitoring, assessing, and reporting the state of the basin. Major milestones that preceded the 2018 SOBR include the preparatory SOBR in 2016 and the draft MRC Indicator Framework in 2017, which was rebranded more appropriately to the Mekong River Basin Indicator Framework (MRB-IF) to reflect its use not only by the MRC but also by cooperating partners and actors in the region. The completion of these key milestones cleared the path towards the completion of the 2018 SOBR. It should be noted that the MRB-IF, another flagship product of the MRC, provides a consistent and streamlined approach to data collection, analysis, and reporting, and therefore is designed to be used by the SOBR.



After the 2018 SOBR's publication, the MRC further disseminated the findings and recommendations during key events, including the launching event of the SOBR at MRCS Headquarters in Vientiane on August 2019, which was attended by about 100 participants from embassies, development partners and international organisations, international NGOs, and MCs; and the 8th MRC Regional Stakeholder Forum in Vientiane, which was attended by about 200 participants. In addition, the MRC used social media to broadcast the events live, which included soliciting feedback from the online audience, as well as regularly posting "key figures and snapshots of findings" to the public. A synthesis version (short concise analytical summary) was also produced for a broad audience and a web-based version is being worked on for launch in 2020.

2018 SOBR Key Findings and Recommended Priority Actions

The key findings and recommended priority actions are provided in detail in Table 3. In summary, the findings for each of the five dimensions are summarized as follows:

Environmental conditions: Reservoir developments in the basin have caused a significant change in the flow regime of the Mekong and are contributing to the observed substantial decrease in sediment concentrations. 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 loss of wetlands and riverine habitats continues alongside increasing pressures on capture fisheries, and urgent actions are needed to protect remaining assets before they are lost.

Social conditions: Living conditions within the basin are improving, but much better information is needed to identify specific water sector impacts and to determine where vulnerabilities lie.

Economic conditions: Substantial economic benefits are being derived in water-related sectors, but a comprehensive assessment of equity between countries and trade-offs between sectors is not yet possible with the available data. A proactive and cooperative approach to basin planning is needed to achieve optimal and sustainable development of the basin in line with MRC's aims.

Climate change: Both temperature and sea level are rising, but other predicted aspects of climate change are not yet evident. MCs are all engaged in managing climate change and this should be reinforced through the MRC's regional basin planning efforts.




Cooperation: New challenges arising from flow regime changes, sediment reduction, and growing pressure on environmental assets and fisheries reinforce the need to build upon existing cooperation through regional planning and joint projects, investments and monitoring.






Table 2: Mekong River Basin Indicator Framework strategic indicators.






Dimension	Strategic indicators
Environment	<input type="checkbox"/> Water flow conditions in mainstream
	<input type="checkbox"/> Water quality and sediment conditions
	<input type="checkbox"/> Status of environmental assets
	<input type="checkbox"/> Overall environmental condition
Social	<input type="checkbox"/> Living conditions and well-being
	<input type="checkbox"/> Employment in MRC water-related sectors
	<input type="checkbox"/> Overall social condition
Economic	<input type="checkbox"/> Aggregate economic value of MRC water-related sectors
	<input type="checkbox"/> Contribution to basin economy
Climate change	<input type="checkbox"/> Greenhouse gas emissions
	<input type="checkbox"/> Climate change trends and extremes
	<input type="checkbox"/> Adaptation to climate change
Cooperation	<input type="checkbox"/> Equity of benefits from the Mekong River system
	<input type="checkbox"/> Benefits derived from cooperation
	<input type="checkbox"/> Self-finance of the MRC

Table 3: SOBR 2018 Summary of conclusions and challenges and recommended priority actions

 No immediate concerns
  Some significant concerns to address
  Considerable concern, urgent action needed
  Insufficient data to form a view, requires action to address knowledge gaps

Strategic indicators	Key questions	Strategic	Status /condition	Challenges	Recommended priority actions
Environment					
Water flow conditions in the mainstream	<i>Are the conditions of water flow in the Mekong mainstream acceptable?</i>		Generally compliant with PMFM, but induced changes in flow regime are of some concern	Managing the impacts of an apparent decrease of wet season flow during the recession period, the increase in dry season low flows and the increase in daily fluctuation in flows experienced in some reaches of the mainstream	Continue monitoring programmes and, in addition to PMFM reporting, monitor decreases in wet season flows and daily fluctuations and consider implications of impacts that may arise, Improve monitoring of water use for various sectors to ensure balance is maintained with increased development
Water quality and sediment conditions	<i>Are the conditions of water quality and sediment acceptable?</i>		Generally compliant with PWQ, but sediment concentrations much reduced	Identifying and implementing practical measures to mitigate the effects of reduced sediment concentrations and minimise further reductions	Continue the sediment and water quality monitoring programmes. Address the implications of reduced sediment concentrations through mechanisms to better manage sediment flows and mitigate transboundary impacts of reduced concentrations
Status of environmental assets	<i>Are key environmental assets in the Mekong basin being adequately preserved and protected?</i>		Loss of wetlands and riverine habitats continues, pressure on capture fisheries becoming evident	Taking urgent action to protect remaining assets and to better manage fisheries Addressing the lack of sufficient data on wetland and riverine habits	Agree clear regional objectives, joint strategies and action plans for protecting and sustainably managing the remaining environmental assets and fisheries. Establish regular monitoring and data collection to address knowledge gaps and conservation activities for wetlands and other environmental assets including fisheries.

Strategic indicators	Key questions	strategic	Status /condition	Challenges	Recommended priority actions
Social					
Living conditions and wellbeing	<i>What social benefits, direct and indirect, are being derived from water resource developments in the Mekong Basin?</i>		Living conditions improving but water sector impacts unclear	Provincial and district level data needed to better understand relationship with water-related sectors alongside greater consistency of data quality and accuracy	Review and refinement of indicators and develop and implement a data acquisition, generation and requirements action plan to address knowledge gaps
Employment in MRC water-related sectors	<i>How are the river-related livelihoods in each country being affected by land and water management decisions?</i>		<i>More information is needed to form a view</i>	Provincial and district level data needed to better understand relationship with water-related sectors alongside greater consistency of data quality and accuracy	Review and refinement of indicators and develop and implement a data acquisition, generation and requirements action plan to address knowledge gaps
Economic					
Aggregate economic value of MRC water-related sectors	<i>What economic value does each Member Country derive from the use of the Mekong river system within the water-related sectors?</i>		<i>More information is needed to form a view</i>	Comprehensive data on all water-related sectors need to be assembled and analysed. Promotion of economic development consistent with the aims of the 1995 Mekong Agreement.	Review and refinement of indicators and develop and implement a data acquisition, generation and requirements action plan to address knowledge gaps Adoption of pro-active regional planning to promote optimal and equitable development through increased cooperation and to identify opportunities for both socio-economic development and environmental protection consistent with these aims
Contribution to basin economy	<i>How important is the economic value of the water-related sectors to the economy of the basin?</i>		<i>More information is needed to form a view</i>	Comprehensive data on all water-related sectors need to be assembled and analysed. Promotion of economic development consistent with the aims of the 1995 Mekong Agreement.	Review and refinement of indicators and develop and implement a data acquisition, generation and requirements action plan to address knowledge gaps Adoption of pro-active regional planning to promote optimal and equitable development through increased cooperation and to identify opportunities for both socio-economic development and environmental protection consistent with these aims
Climate Change					
Greenhouse gas emissions	<i>To what extent is the Mekong Basin contributing to global GHG emissions?</i>		LMB countries (as a whole) emission is about 1.5% of global total	Promote development practices within the basin that minimise GHG emissions consistent with each country's Nationally Determined Contribution under the Paris Agreement	Promotion of development practices that minimise GHG emissions Develop and implement a data acquisition, generation and requirements action plan to address knowledge gaps

Strategic indicators	Key strategic questions	Status /condition	Challenges	Recommended priority actions
Climate change trends and extremes	<i>Is there evidence of climate change within the basin?</i>	 Some evidence of rising temperatures and sea levels. Flood damages are also higher. Other CC impacts are not seen.	Continued monitoring needed Continued assessment of potential future CC impacts based on latest available global and regional forecasts	Incorporate sea-level rise as an indicator in future SOBRs Continue hydro-meteorological data collection programmes
Adaptation to climate change	<i>How resilient are the current water infrastructure and plans to climate change?</i>	 All countries have policies and strategies in place and 166 climate adaptation projects identified (2016)	To ensure that climate change is fully factored into development plans and that resilience is assured	Adoption of pro-active regional planning to address climate change and promote optimal and equitable development through increased cooperation
Cooperation				
Equity of benefits from the Mekong River system	<i>How well is Mekong Basin development moving towards optimal and sustainable development?</i>	 Significant development in all countries, <i>but equity considerations need more data as above</i>		
Benefits derived from cooperation	<i>What is the added value of cooperation under the 1995 Mekong Agreement facilitated by the MRC?</i>	 USD 838m of projects supporting cooperation identified in National Indicative Plans	Adoption of pro-active regional planning to promote <i>equitable</i> use of basin's resources, together with establishment of a clear mechanism to define equity of benefit and trade-off arising from development throughout the basin in water-related sectors	Adoption of pro-active regional planning to address climate change, promote optimal and equitable development through increased cooperation and to identify opportunities for both socio-economic development and environmental protection consistent with these aims
Self-finance of the MRC	<i>Is the MRC on-track to self-financing by 2030?</i>	 MRC budgets in line with achieving self-financing by 2030, alongside renewed commitments to this end	Retain focus on core function activities and look to ways to improve efficiency in delivering these	Identify smart and cost-effective approaches to basin monitoring, and information and knowledge sharing

The 2018 SOBR Key Recommendations for the Next Basin Development Strategy

The following five recommendations are to be considered when updating the Basin Development Strategy:

- Continue and enhance monitoring of flow conditions and water quality
- Develop and implement an MRC Data Acquisition and Generation Action Plan
- Address the problem of reduced sediment concentrations
- Address the need to take urgent action to preserve and protect remaining environmental assets
- Adopt a more proactive approach to basin planning and the management of trade-offs between sectors and countries

EVIDENCE OF CHANGE

Numerous regional and national meetings have been held with national line and implementing agencies during preparation of the SOBR. The Report represents the consolidated efforts of more than 100 national, regional, and international experts on Mekong issues, making it a comprehensive body of knowledge that is not only regionally relevant but internationally as well, thus contributing to the positive reputation of the MRC globally. It is also the first time that an MRC activity required the participation and input of almost all the ministries in the four countries (i.e., over 50 ministries). Such an extensive undertaking helped build closer working relationships between the MRCS and the various line and implementing agencies that will certainly benefit future cooperation.

The inclusion of a review of conditions in the Upper Mekong Basin for the first time not only makes the analysis more holistic but also creates yet another avenue to promote closer cooperation with China and Myanmar in the years to come. Data collection for the SOBR was for the first time more coherent, systematic and deliberate as it was guided by the set of indicators in the MRB-IF that needed to be measured or assessed.

The final 2018 SOBR version was completed in early 2019 and received agreement of the MRC JC for publication as a technical reference during the JC meeting on 24 April 2019 in Vung Tao City, Viet Nam. Correspondingly, the final version of the MRB-IF was also completed in early 2019 and published in December 2019. More meetings attended by a broader range of stakeholders were held after its publication in 2019. These meetings have promoted greater awareness and common understanding of the findings and recommendations of the SOBR. With the knowledge of the environmental and socio-economic conditions and trends in the basin as brought by development pressures and the changing climate, the MRC and its partners are in a better position to propose evidence-based management interventions and have great urgency to pursue the necessary cooperation to promote a more sustainable development pathway for the basin.

The SOBR brings focus on the critical issues that the MRC and its partners must seek to address. While living conditions within the basin are rapidly improving in general, it is at considerable cost to the environment as a result of permanent modifications to the mainstream flow regime, substantial reduction in sediment flows, continuing loss of wetlands, deterioration of riverine habitats, and the growing pressure on capture fisheries. It is anticipated that national line and implementing agencies will also use the new baseline conditions to further inform, and if needed, update their development plans and projects.

The MRC for its part wasted no time incorporating 2018 SOBR's findings and recommendations into various MRC activities in 2019. The most important one is the preparation of the next 10-year Basin Development Strategy for 2021 – 2030 and the MRC SP 2021-2025, which followed a new approach in having the BDS strategic priorities directly target the five dimensions of the SOBR. For the first time, the effectiveness of BDS implementation will be measured in terms of the (positive) changes it will bring in the state of the basin through the collective efforts of the MRC and all relevant actors.

To have even better information in the next SOBR, the MCs also agreed to pursue the development of the Data Acquisition and Generation Action Plan (DAGAP). DAGAP aims to address specific data and information

gaps that currently exist to completely and accurately monitor and evaluate basin conditions based on the MRB-IF.

CONTRIBUTION TO SDGs

The 2018 SOBR presents a comprehensive report of the environmental and socio-economic conditions and trends in the Mekong Basin within the context of a changing climate. It also identifies issues and challenges and recommends priority actions to address them for optimal and sustainable development of the basin. The report can support the achievement of the following SDGs:

Goal 6: Water and Sanitation, specifically target 6.3: by 2030, improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe re-use globally and 6.5: by 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

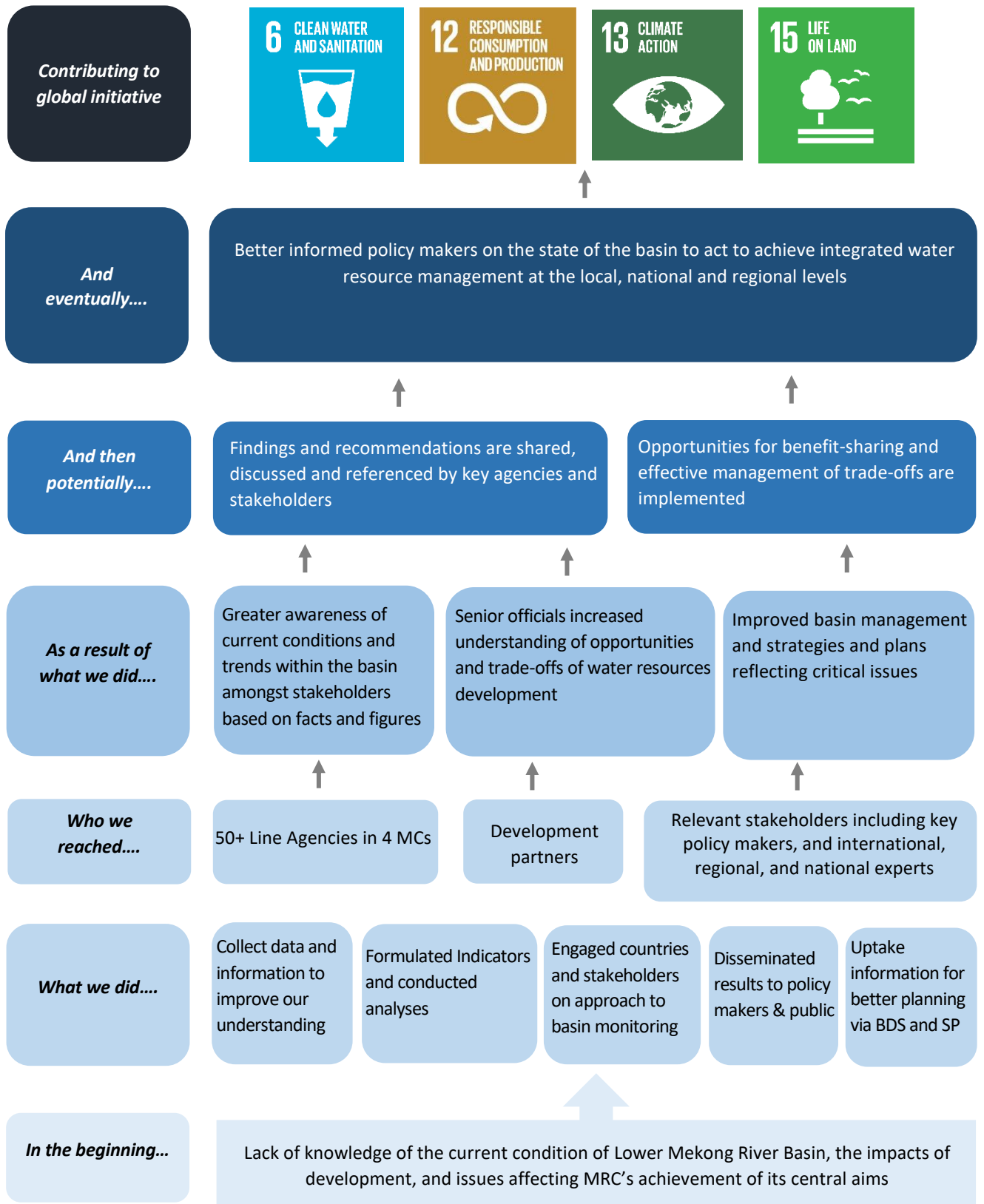
Goal 12: Responsible Consumption and Production, specifically target 12.2: by 2030, achieve the sustainable management and efficient use of natural resources.

Goal 13: Climate Action, specifically target 13.3: improve education, awareness-raising, and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

Goal 15: Life on Land, specifically target 15.5: take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species; and target 15.9: by 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies, and accounts.

Pathway to Change

Better informed Basin Planning and Decision-Making using the MRC State of the Basin Report



OUTCOME 2

Drought Management Strategy as a Unified Regional Response to the Increasing Risk of Drought in the Mekong Basin

INDICATOR:

- Evidence that National Plans benefit from basin-wide strategies and action plans

There is a strong indication that the lower Mekong region is currently at high risk of droughts and the trend is for the risk to continue to exacerbate as evidenced by the increasing intensity and duration of the droughts that occurred in the past two decades. This is further confirmed by the findings of several climate change studies by the MRC and other organisations showing the LMB is likely to see more severe droughts in the next 30 to 90 years due to less precipitation, high air temperatures, and high evapotranspiration combined with increasing demand for water as a result of the growing population in the basin. The severe droughts in the Lower Mekong Basin have caused substantial economic losses due to damage to agricultural crops, negative impacts on the environment, and adverse effects on people's livelihoods. These impacts have also been observed to put significant stress on agricultural, domestic, and industrial water use.

Year 2019 saw the completion of MRC's Drought Management Strategy for 2020-2025, a regional strategy that serves as a response of MRC Member Countries to the urgent needs to address the increasing risk of drought across the region.

Endorsed by the JC and approved by the Council in November 2019, the regional drought strategy aims to bring improvements in five priority areas namely: i) water use, hydrometeorology, groundwater, soil moisture, and salinity monitoring; ii) drought monitoring, forecasting, and early warning; iii) MRC capacity on drought assessment and planning; iv) impact mitigation and regional collaboration; and v) information and data sharing.

PROGRESS

The DMS was completed at the end of 2019 following consultations at regional and national levels. The strategy was based on several studies and investigations including a regional study on drought risk assessment for the LMB in 2013, national studies and fact-finding missions between 2013 and 2017, and a regional study on land and water resources analysis in 2017-2018. The first draft of the strategy was discussed in a regional consultation workshop on 12 December 2017 in Siem Reap, Cambodia, followed by national consultation workshops in February and March 2018.

After several revisions to address the MCs' feedback during the consultations, the strategy went through a final review and consultation at the second and final regional consultation workshop in Bangkok, Thailand on 26 February 2019. The strategy was further revised following internal MRCS review and directives, as well as final comments from the JC in April 2019. It was then submitted again for consideration, endorsement and approval of the JC and Council in November of that year.



MRC ministerial council approves a drought management strategy, other policies, boosting Mekong countries' ability to prepare for future disaster

Picture: The MRC Council approved the MRC Drought Management Strategy 2020-2025 during the 26th Meeting of the MRC Council on 26 November 2019 in Phnom Penh, Cambodia

Strategic Priority Areas

The DMS 2020-2025 priority areas, hence its proposed outputs and activities, are organised into five main clusters:

1. **Indicator Monitoring:** This includes hydrometeorological and reservoir monitoring, monitoring of dry season flows under PMFM and PWUM, groundwater monitoring, soil moisture and crop condition monitoring, and salinity level monitoring.
2. **Drought Forecasting and Early Warning:** This includes drought monitoring, forecasting and early warning.
3. **Capacity Building in Drought Assessment and Planning:** This includes national and regional trainings, regional and international workshops and conferences, and experience of exchanges with other river organisations.

4. **Mitigation Measures:** This includes collaboration with MRC Dialogue Partners and with national agencies and regional institutions on drought disaster management. It also includes the feasibility study on basin water retention through collaboration with Thailand on the Monkey Cheeks or Kaeng Ling project, water demand management measures, development of guidelines on drought adaptation, and pilot activities on drought adaptation measures.
5. **Information Sharing and Dissemination:** This includes drought information dissemination, and drought data and information documentation.

EVIDENCE OF CHANGE

The JC's endorsement and the Council's approval of the Drought Management Strategy 2020 – 2025 on 26 November 2019 during the 26th MRC Council Meeting in Phnom Penh, Cambodia, was the culmination of years of preparation of successive drafts that began in 2017 and which involved several national and regional consultations. To the public, the approval of the strategy was also timely, as it came at a time of historical low flow year in the Mekong. Press and social media coverage of the strategy announcement was extensive, raising the profile and pro-activeness of the MRC in addressing an urgent issue. Following the JC's endorsement and Council approval, some of the funding needed for implementation was subsequently endorsed by the Japanese Government with a financial commitment of USD 1.9 million under Official Development Assistance (ODA).

The DMS is anticipated to immediately lead to tangible changes and benefits in the Mekong region as it is implemented and begins to generate the target outputs under each of its strategic priority areas. These results will include: i) gaps in monitoring data and models are filled to support drought forecasting and early warning; ii) drought conditions and trends in the basin are accurately assessed; iii) knowledge and capacity of MRCS, NMCS, and MCs in identifying and implementing drought mitigation and adaptation measures are enhanced; iv) impact mitigation and collaboration implemented; and v) drought forecasts and early warnings are effectively disseminated.

While MRC's drought management activities began as early as 2011, the development of the strategy has significantly raised the institutional knowledge of the MRC and MCs' at a holistic and encompassing level in particular of the pressing issues that need to be addressed with urgency. This has led to MCs' acknowledging the need to coordinate their drought mitigation actions, such as those shown in the table below, which lists such actions by responsible line and implementing agencies.

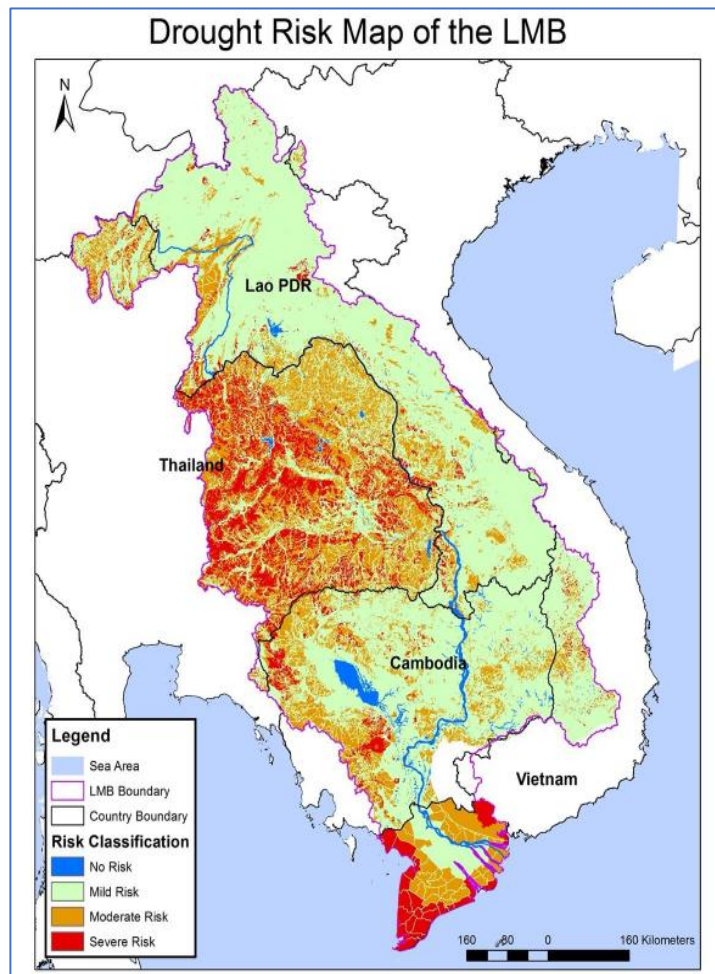


Figure 6: Drought risk assessment map of the LMB

Table 4: Drought adaptation actions by MRC and MCs mapped by responsible line agencies

	Cambodia	Lao PDR	Thailand	Viet Nam	MRC
Mitigation Actions	<ul style="list-style-type: none"> • Early notification by MOWRAM / Seasonal Outlook • NCDM provide water pumps to irrigate agriculture • Supply water tank to drought-prone areas • Introduce crop diversification (resilience crops) • Build hydro-met monitoring stations in drought-prone areas 	<ul style="list-style-type: none"> • Build hydro-met monitoring stations in drought-prone areas • Carry out rehabilitation project on agricultural irrigation 	<ul style="list-style-type: none"> • Use of ground water • Water diversion from the mainstream • Monkey Cheek dams • Crop diversification • Drought monitoring & seasonal outlook • Rainmaking 	<ul style="list-style-type: none"> • Request upstream countries to release water • Provide drought monitoring on meteo and hydrological indicators • Notify farmers on salinity intrusion level 	<ul style="list-style-type: none"> • Provide technical support in adding drought monitoring indicators and extending new monitoring stations • Provide drought forecasting and early information including seasonal outlook • Assist MCs in building capacity on drought management work • Build regional mechanism on cross-country collaboration and data sharing • Help MCs develop regional drought adaptation guidelines • Carry out necessary studies on drought related issues as needed • Issue monthly bulletin on drought forecasting
Implementing Line agencies	<p>MOWRAM:</p> <ul style="list-style-type: none"> - Early warning on seasonal outlook - Release water from dams to the farms - Provide generators to farmers for water pumping - Build hydro-met stations in drought-prone areas <p>NCDM:</p> <ul style="list-style-type: none"> - Provide water tanks to farmers - Report disaster impacts to the Council Ministers - Develop drought management strategy <p>MAFF:</p> <ul style="list-style-type: none"> - Provide generators to farmers for water pumping - Introduce water-resilient crops to farmers <p>CRC:</p> <ul style="list-style-type: none"> - Provide post disaster aid to drought victims 	<p>MONRE:</p> <ul style="list-style-type: none"> - Build hydro-met monitoring stations in drought-prone areas - Carry out rehabilitation project on agricultural irrigation <p>Ministry of Agriculture and Forestry (MAF):</p> <ul style="list-style-type: none"> - Carry out rehabilitation project on agricultural irrigation <p>NDMC:</p> <ul style="list-style-type: none"> - Develop disaster management strategy 	<p>DDPM:</p> <p>Set up policy and coordinate on drought mitigation</p> <p>DWR of MOENRE:</p> <ul style="list-style-type: none"> - Develop knowledge-based technology including early warning system - Collect data on water resources management <p>RID:</p> <ul style="list-style-type: none"> - Carry out groundwater projects - Carry out rain making activities - Carry out water diversion - Collect drought impacts and conditions from community level - Conduct water resources planning <p>DAE:</p> <ul style="list-style-type: none"> - Monitor crop growing progress <p>DLD:</p> <ul style="list-style-type: none"> - Map drought frequency occurrence <p>GISTDA:</p> <ul style="list-style-type: none"> - Carry out drought monitoring and seasonal outlook 	<p>MARD:</p> <ul style="list-style-type: none"> - Design national disaster prevention and control strategy <p>HMS of MONRE:</p> <ul style="list-style-type: none"> - Provide drought monitoring, forecasting, and early warning <p>Viet Nam Television and Voice of Viet Nam:</p> <ul style="list-style-type: none"> - Disseminate the forecasting and early warning information <p>PPCS and MARD:</p> <ul style="list-style-type: none"> - Record damages and estimate economic losses 	<p>RFDMC of TD:</p> <ul style="list-style-type: none"> - Develop action plan and budget allocation for the DMS 2020-2025 - Coordinate with MCs to implement the whole DMS: <ul style="list-style-type: none"> • Support MCs in providing technical guidelines at national areas e.g. extend hydro-met stations, install new drought parameter monitoring stations • Build capacity on drought management subjects to MCs and extend collaboration with academic institutes • Develop drought adaptation guidelines at regional level addressing both national and transboundary issues • Enhance collaboration with dialogue partners in data and information sharing • Develop regional drought forecasting platform with monthly drought condition analysis dissemination - Conduct M&E on DMS implementation - Develop new drought management strategy beyond 2025

CONTRIBUTION TO SDGs

MRC's regional drought management strategy for 2020-2025, which aims to improve drought monitoring and forecasting in the LMB and the region's capacity to implement mitigation and adaptation measures, will contribute to the achievement of the following UN SDGs:

Goal 1: No Poverty, specifically target 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.

Goal 2: Zero Hunger, specifically target 2.4: By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, help maintain ecosystems, strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters, and progressively improve land and soil quality.

Goal 3: Good Health and Wellbeing, specifically target 3.D: Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks.

Goal 6: Water and Sanitation, specifically target 6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity, and substantially reduce the number of people suffering from water scarcity; target 6.5: by 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate; and target 6.6: by 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.

Goal 13: Climate Action, specifically target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries; target 13.2: Integrate climate change measures into national policies, strategies and planning; and target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

Goal 15: Life on Land, specifically target 15.3: By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.

Pathway to Change

Drought Management Strategy as a Unified Regional Response to the Increasing Risk of Drought in the Mekong Basin



Contributing to global initiative

And eventually....

Economic losses due to damage of agricultural crops, negative impacts on the environment, and adverse effects on people's livelihoods in the Lower Mekong Basin are reduced

And then potentially....

Monitoring data gaps are filled and models enhanced to support drought forecasting and early warning

Drought conditions and trends in the basin are accurately assessed

Knowledge and capacity of MRCS, NMCS, and Member Countries on drought mitigation and adaptation measures are enhanced

Drought forecasting/early warnings are effectively disseminated & adaptation actions and collaborations are implemented

As a result of what we did....

Drought management strategy 2020-2025 prepared, endorsed by the JC and approved by the Council

Implementation plan prepared and donor funding commitment secured

Who we reached....

Cambodia (MOWRAM, NCDM, MAFF, CRC)

Lao PDR (MONRE, MAF, NDMC)

Thailand (DDPM, MONRE DWR, RID, DAE, DLD, GISTDA)

Viet Nam (MARD, MONRE HMS, Viet Nam Television, Voice of Viet Nam, PPCS, MARD)

What we did....

Regional drought risk assessment conducted

Drought-prone areas in the region identified through national studies and fact-finding missions

National drought early warning systems surveyed

Regional crop water demand and supply conducted

National drought adaptation actions identified

In the beginning...

Lack of a regional response to address the increasing risk of drought across the region

OUTCOME 2

Advancing Regional Cooperation to identify and protect Environmental and Ecological Assets through the Environment Strategy

INDICATORS:

- Number of TB national and provincial policies and plans integrating MRC basin-wide analysis and strategies
- Evidence that National Plans benefit from basin-wide strategies and action plans

Basin-wide scenarios assessments and the State of Basin Report have shown that environmental assets in the Mekong Basin will continue to erode unless the four member countries in cooperation with its partners and broader stakeholders implement a strategy to preserve prioritised environmental assets that are of mutual value – economically, socially and environmentally – from a basin-wide perspective. Environmental assets in the LMB as defined by the Member Countries are:

“Naturally occurring areas that provide environmental ‘functions’ and ‘services’ for sustainable generations (current and future) of the Lower Mekong Basin and could include but are not limited to terrestrial, aquatic ecosystems, including biodiversity hotspots, wetlands, fish species, etc., which provide important ecosystem functions and/or services that are mutually beneficial to the four Lower Mekong countries’ and their current and future generations”.

The Mekong Strategy for Basin-wide Environmental Management for Environmental Assets of Regional Importance in the Lower Mekong Basin (Environment Strategy) was therefore developed as a cooperative regional environmental strategy in response to this need to protect environmental and ecological assets, including those providing ecosystem services in the basin. While each Member Country has existing national strategies and associated legal and institutional frameworks that govern the use and conservation of natural resources and the protection of environmental assets within their respective jurisdictions, they have all nevertheless recognize the need for such a regional strategy.

As this is the first strategy of its kind, the Environment Strategy identifies strategies to protect and conserve an initial list of 12 environmental assets due to their importance regionally in supporting basin-wide processes or due to their transboundary nature. Underpinning the importance of the 12 REAs are the ecosystem services (ES) they provide to the Mekong in the provisioning of food, water, medicine, fibre and wood to support sustainable livelihoods; regulating important processes such as soil formation and composition, pest and disease control, and climate; and supporting other services such as nutrient cycling, and aesthetic and cultural benefits - all of which are mutually beneficial for sustainable generations (current and future) in the LMB.

PROGRESS

The final draft strategy (Version 4.0) was completed in November 2019 and will be submitted for endorsement by the MRC JC and approval by the MRC Council in 2020. A Project-Based Action Plan for the implementation of the Strategy is expected to be completed in 2020.

To support the development of the Environment Strategy, a regional review was undertaken of environmental assets with national and regional importance and existing studies, policies, strategies and action plans for the management of environmental assets in the LMB, which identified the relevance of adopting an ES approach when managing important environmental assets. The regional review resulted in the development of a baseline of national and regional environmental assets through the national and regional inventories to support the next steps in identifying the environmental assets of high economic, social and environmental value at a basin-wide level.

Following regional consultation at the first meeting of the Expert Group on Environmental Management in Bangkok, Thailand, on 26 October 2018, and subsequent National Consultations with the four MCs in March 2019, a set of selection criteria for prioritising environmental assets of regional importance was agreed. The criteria include biodiversity/ecology, hydrology, rareness and uniqueness, ecosystem services, and global / regional / transboundary (basin-wide processes) importance.

This led to a mutually agreed final list of the top 12 REAs from more than 120 environmental assets. The finalization of the Selection Criteria and the top 12 REAs highlighted the accomplishment of the second expert group meeting in Hanoi, Viet Nam on 5 June 2019. The completion of these key milestones allowed MRCS and the expert group to begin ramping up their efforts to finalise the Strategy itself. This involved several successive drafts of the Environment Strategy to incorporate the inputs received. The final draft was produced as a result of the final expert group meeting in Bangkok, Thailand on 30th October 2019.



Picture: Members of the Expert Group on Environmental Management discuss and agreed on the 12 REAs during its meeting in Hanoi, Viet Nam on 5 June 2019

In summary, year 2019 saw the completion of the following three key documents as a result of intensive and highly collaborative work between the MRCS, MCs, and other international/regional organisations including the International Union for Conservation of Nature (IUCN):

- Report on Environmental Assets with National and Regional Importance and Existing Studies, Policies, Strategies and Action Plans for the Management of Environmental Assets in the Lower Mekong Basin
- Selection Criteria for the Prioritised Environmental Assets with Regional Importance
- Draft Mekong Strategy for Basin-wide Environmental Management for Environmental Assets of Regional Importance in the Lower Mekong Basin 2021-2025

Strategic Priorities

The Strategy includes the following strategic priorities:

1. Identify and explicitly define regional policy drivers that are currently or will in the future significantly impact (positively and negatively) on regional environmental assets and develop a process for these regional environmental assets to be considered in terms of trade-offs, risks and synergy benefits in project design;
2. Identify and establish an integrated permanent regional environmental asset network across the whole of the LMB landscape;
3. Identify actions to improve or maintain REAs so that they are well-functioning and develop strategies for them to adapt (and transform if necessary) to mounting pressures;
4. Ensure community engagement and awareness programs are central to the protection and management of regional environmental assets;
5. Nurture existing partnerships and investigate new opportunities;
6. Review social and economic instruments and other incentive mechanisms to manage regional environmental assets;
7. Identify opportunities for regional funding;
8. Review social and economic instruments and other incentive mechanisms to manage regional environmental assets;
9. Develop guidance and regional action plans for agriculture, tourism, fisheries and forestry, and other activities in REAs;
10. Develop complementary legal frameworks to enhance cross-border collaboration in the management of REAs.

EVIDENCE OF CHANGE

While each MC has existing national strategies and associated legal and institutional frameworks that govern the use and conservation of natural resources and the protection environmental assets, their extensive participation in the development of the Environment Strategy demonstrates the desire and need for a regional strategy. Such recognition of this need arose from increased awareness, common understanding, and urgency of the importance of taking a basin-wide approach in managing and protecting assets, knowing that development pressures are increasing. It is also a recognition that sustainable development could not be simply achieved by managing risks of development projects alone. Some areas of the basin that have high value environmental assets should be protected more fully.

Taking advantage of the synergies and combined knowledge and capacity of the MCs to protect environmental assets, there is also an increase in confidence in the MCs that the regional strategy will complement the national strategies and potentially alleviate many of the common challenges and limitations posed, for example, by lack of data, capacity, and funding. For example, the Mekong Fund which started as a general concept, is now under more serious consideration as a potential mechanism to meet the strategic priority on regional funding.

The development of the Environment Strategy, and in particular securing an agreement on the 12 prioritised environmental assets of regional importance (see table and map below), was anticipated to involve a difficult and contentious process. The fact that it did not demonstrates a change for the better in which the MCs' strong commitments, increased environmental value, and active participation have resulted in the relatively speedy completion of the project. Moreover, the highly collaborative work in late 2018 and throughout 2019 that led to the completion of the Environment Strategy and its accompanying technical reports represents a

tremendous increase in knowledge and capacity of key actors and decision makers at the national level, which will only further fuel the effective implementation of both the regional and national frameworks. For example, the collaborative work has revealed the following issues and opportunities at the national level:

- The importance of inter-ministry collaboration since protection of environmental assets such as wetlands are part of the mandate of several ministries (e.g., agriculture, environment, natural resources, forestry, water resources, etc.) which may have competing interests and goals.
- Insufficient data and information available as a result of ineffective monitoring programs which, lead to lack of accountability. The MCs have realized that the regional inventory and maps of the environmental assets can contribute in driving effective monitoring programs at the national level
- The existing national frameworks are cumbersome and there are benefits to simplifying and making them complementary to enhance opportunity for greater collaboration. The MCs have also expressed the possibility of adopting at the national level the selection criteria that led to the selection of the 12 REAs. It is conceivable that countries may adopt some of the strategic priorities in the Environment Strategy to strengthen their existing national legislation, policies, and strategies.

Regional Environmental Assets

The 12 REAs are shown in the table and map below indicating their regional risks and opportunities. They cover six percent of the LMB in terms of area and are a representative selection of similar types of sites throughout the basin. Whilst the 12 REAs have been identified by the four MCs as a priority on the basin-wide scale, they do not preclude the need for all environmental assets, including those transboundary hotspots, to be eventually protected and managed.

Table 5: Twelve regional environmental assets of importance and priority in the Lower Mekong Basin indicating their respective risks and opportunities

Name of REA and location ⁱⁱ	Ecoregions Represented ⁱⁱⁱ	Regional Risks ^{iv} and Opportunities
Nam Et Phoulei National Park, north eastern Lao PDR	1. Northern Indochina Subtropical Forest 2. Luang Prabang Mountain Rainforest	Planned hydropower, mining and agriculture development within the NP could affect its condition and integrity. Provides watershed protection, groundwater recharge and reduced sedimentation and erosion.
Nong Bong Kai, Wiang Nong Lhom and Mainstream Mekong, northern Thailand	1. Northern Indochina Subtropical Forest 2. Northern Thailand/Lao Moist Deciduous Forest	At risk from cascading hydropower development, agriculture development, rock blasting and dredging for international navigation and land use/resource conflict. Provides flood protection, groundwater recharge and reduced drought impacts.
Lower Songkhram River, north-eastern Thailand	1. Northern Khorat Plateau Moist Deciduous Forests 2. Northern Annamites Rainforest	At risk from cascading hydropower development, agriculture development and land use/resource conflict. Provides flood protection, groundwater recharge and reduced erosion and drought impacts. Occasionally creates a backflow effect similar to Tonle Sap, Cambodia.

ⁱⁱ In order from upstream to downstream.

ⁱⁱⁱ The 12 regional environmental assets of importance in the LMB are representative of all ecoregions that fall within the basin, except for the Southern Annamites Montaine Rainforests, where a small portion of these forest types are located in southern mountainous areas of Lao PDR and Viet Nam.

^{iv} Risks include increased soil erosion, decline in water quality and fisheries populations, obstruction of migratory fish species, decrease in sedimentation, increase in water pollution, increased vulnerability to changes in climate, etc.

Name of REA and location ⁱⁱ	Ecoregions Represented ⁱⁱⁱ	Regional Risks ^{iv} and Opportunities
Xe Champhone Ramsar Wetland, south-eastern Lao PDR	<ol style="list-style-type: none"> Central Indochina Dry Forest Southern Eastern Indochina Evergreen Forest 	At risk from cascading hydropower development, agriculture development and land use/resource conflict. Provides watershed protection, groundwater recharge, maintains dry season flow and reduces erosion, flooding and impact of drought.
Beung Kiat Ngong Ramsar Wetland, southern Lao PDR	<ol style="list-style-type: none"> Central Indochina Dry Forest 	At risk from cascading hydropower development, agriculture development and land use/resource conflict. Provides important component of the site's hydrological system, with lateral groundwater inflows critical for maintaining the wetlands water balance. Also provides protection from flooding, and erosion.
Khao Yai and Thap Lan National Park (Dongphayayen-Khaoyai Forest Complex), eastern Thailand	<ol style="list-style-type: none"> Central Indochina Dry Forest Southern Eastern Indochina Evergreen Forest Cardamom Mountain Rainforest 	At risk from large scale linear developments. Provides watershed protection, freshwater supply, groundwater recharge and discharge, and reduced sedimentation and erosion.
Virachey National Park, north-eastern Cambodia	<ol style="list-style-type: none"> Central Indochina Dry Forest Southern Eastern Indochina Evergreen Forest 	At risk from upstream hydropower development, agriculture development and land use/resource conflict. Provides watershed protection to the Sesan and Sekong Rivers, ground water recharge, carbon storage, protection from flooding and reduced sedimentation and erosion.
Sre Pok Wildlife Sanctuary, eastern Cambodia	<ol style="list-style-type: none"> Central Indochina Dry Forest 	At risk from upstream hydropower development, mining, agriculture development, impacts of climate change and land use/resource conflict. Provides watershed protection, ground water recharge, and reduced flooding, erosion and drought impacts.
Yok Don National Park, central highlands, Viet Nam	<ol style="list-style-type: none"> Central Indochina Dry Forest Southern Eastern Indochina Evergreen Forest 	Provides watershed protection, fresh water supply, ground water recharge and discharge, and reduced sedimentation and erosion.
Tonle Sap Multiple Use Area, central Cambodia	<ol style="list-style-type: none"> Tonle Sap Freshwater Swamp Forest 	At risk from cascading hydropower development, agriculture development and land use/resource conflict. Provides important function for the LMB hydrological system for the 12,876 km ² Cambodian floodplain that the Mekong replenishes with water and sediments annually.
U Minh Thuong National Park, Mekong Delta, Viet Nam	<ol style="list-style-type: none"> Indochina Mangroves Tonle Sap Mekong Peat Swamp Forest 	At risk from cascading hydropower development, agriculture development and land use/resource conflict. Provides important role in maintaining the soil and water quality in the buffer zone by preventing the acidification of topsoil and surface water, filtering ground water, and storing freshwater during the dry season.
Mui Ca Mau National Park, Mekong Delta, Viet Nam	<ol style="list-style-type: none"> Indochina Mangroves 	At risk from cascading hydropower development, agriculture development and land use/resource conflict. Provides important protection from saltwater intrusion and erosion, and transports sedimentation and nutrients upstream.

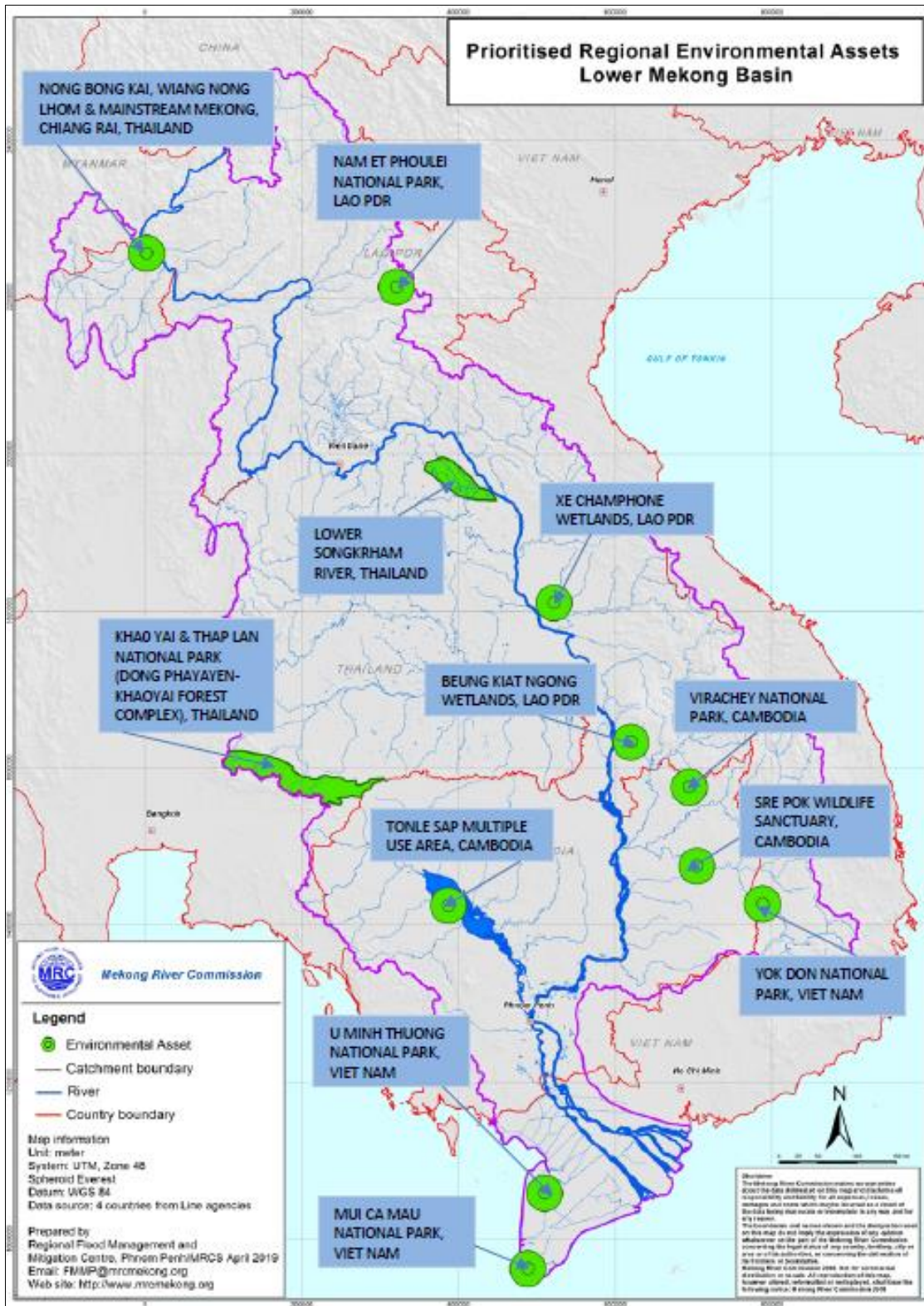


Figure 7: Locations of prioritised regional environmental assets in the Lower Mekong Basin

CONTRIBUTION TO SDGs

The Environmental Strategy as a cooperative regional environmental strategy aims to provide a framework and strategic priority actions for the protection of environmental and ecological assets, including those providing ecosystem services in the LMB. It can contribute to the achievement of the following UN SDGs:

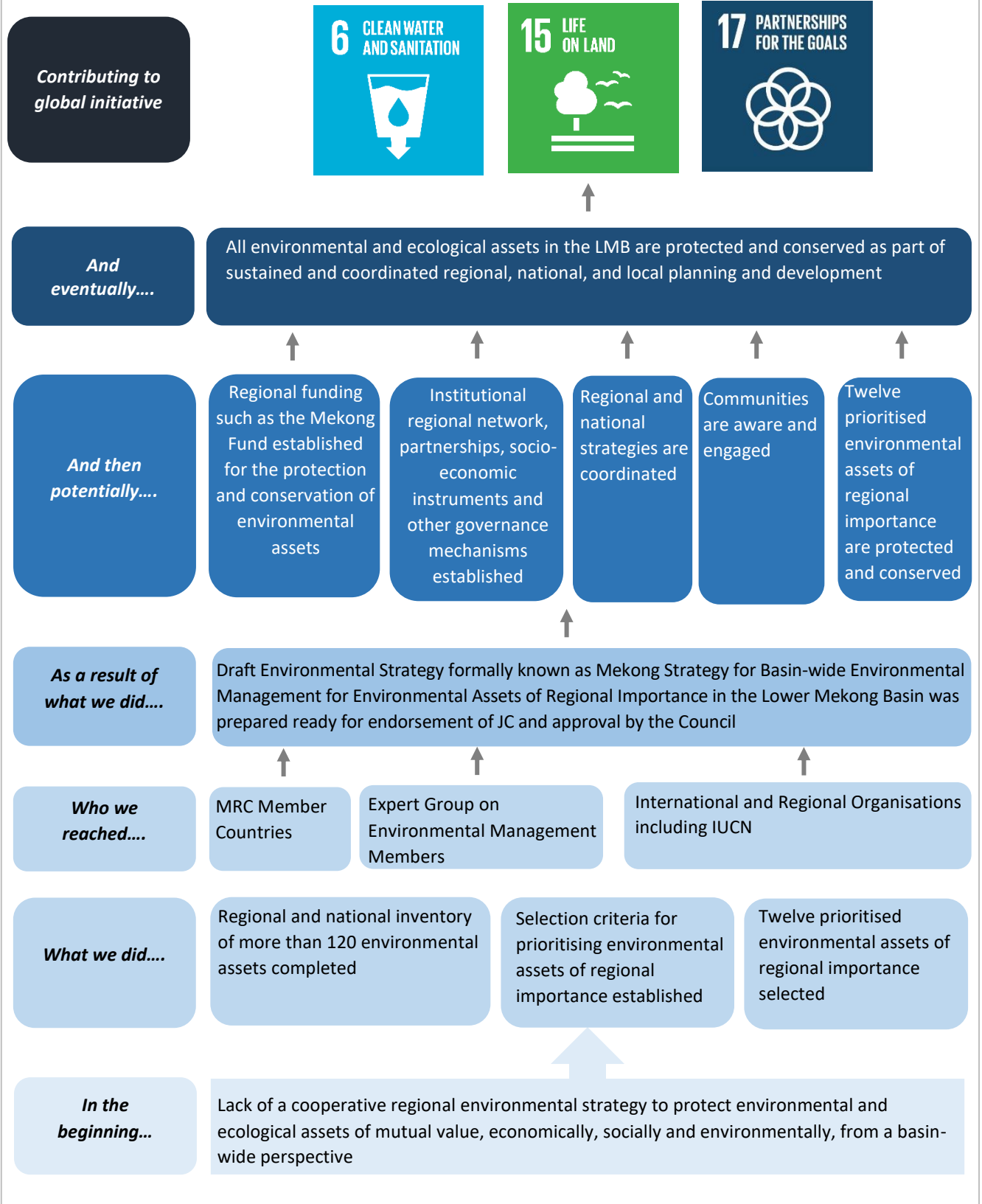
Goal 6: Water and Sanitation, specifically target 6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate; and target 6.6: By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.

Goal 15: Life on Land, specifically target 15.1: By 2020, 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; target 15.4: By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development; target 15.5: Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species; target 15.9: By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts; target 15.A: Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems; and target 15.B: Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation.

Goal 17: Partnerships for the Goals, specifically target 17.9: Enhance international support for implementing effective and targeted capacity building in developing countries to support national plans to implement all the Sustainable Development Goals, including through North-South, South-South and triangular cooperation; target 17.14: Enhance policy coherence for sustainable development; target 17.16: Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries; and target 17.17: Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships.

Pathway to Change

Advancing Regional Cooperation to identify and protect Environmental and Ecological Assets through the Environment Strategy



OUTCOME 3

Agreement on the Draft Joint Environment Monitoring Programme and Proposed Pilot Testing

INDICATORS:

- Number of TB national and provincial projects applying MRC guidelines
- Evidence of national and basin benefits in using MRC guidelines and standards

There is a strong need to determine impacts, including the transboundary impacts of mainstream hydropower projects, and to distinguish project-specific induced changes to the basin from the cumulative basin-wide impacts of all other developments. Ascertaining the impacts attributable to a specific project is crucial in identifying and implementing appropriate adaptive management approaches for that project in order to avoid, minimise, and mitigate negative impacts including both localized and transboundary impacts. MRC's Joint Environment Monitoring for Mekong Mainstream Hydropower Projects (JEM) Programme is designed to address this critical knowledge gap and to serve as a decision-support framework to elevate joint cooperation and enable Member Countries to monitor and assess with more certainty whether targeted mainstream hydropower projects are having any impacts, and if there are concerns, to build confidence about any proposals for revised management approaches for these projects.

The JEM Programme provides a common, standardised and scientifically robust programme for the joint monitoring of key environmental indicators to support impact assessments of Mekong mainstream hydropower projects on five main monitoring disciplines: hydrology and hydraulics, sediment and geomorphology, water quality, aquatic ecology, and fish and fisheries. The overall objective is for the JEM Programme to be established as a regional monitoring programme that generates and shares reliable scientific data and information in a continuous and timely manner from appropriate locations to detect site- or project-specific environmental changes (or impacts). The JEM Programme builds on existing MRC basin-wide river monitoring and existing monitoring efforts by other stakeholders and developers within the localized area of the development site. The combination of data and information from the basin-wide monitoring network which provides basin-wide monitoring and assessments, and the JEM Programme, will provide a more complete, scientific, and reasonably accurate determination of both project-specific and basin-wide cumulative and transboundary impacts.

PROGRESS

On 27 July 2016 during the 44th MRC JC Meeting in Phnom Penh, Cambodia, the JEM Programme was presented for the first time resulting in the JC's agreement and instruction to develop the programme further and pilot it on some mainstream hydropower projects before rolling it out basin wide. The idea for joint monitoring was raised and welcomed by Lao PDR during the Prior Consultation process for the Don Sahong Dam. It was further agreed as part of a Joint Project between Cambodia and Lao for the Khone Falls under the National Indicative Plan 2016-2020.

Three years later, after a series of national and regional consultations in 2018 and early 2019, including regional Expert Group on Environmental Management (EGEM) meetings in January and May 2019 with participation of the project developers of Xayaburi, Don Sahong, Pak Beng and Pak Lay hydropower dams, a final draft JEM Programme document, including two pilot project proposals for Don Sahong and Xayaburi hydropower projects, was agreed upon by MCs during the EGEM Meeting in Luang Prabang in May 2019. The JEM Programme and the proposed pilot projects were presented during the 49th JC Meeting in September 2019 at which JC Members took note of progress.

Bolstered by GIZ's technical and financial assistance, USD 1,500,000 has been secured to cover the contracts for international experts to technically support the implementation of the JEM pilot projects, with the contribution from the MRC Basket Funds of about USD 700,000 to implement the 11 top-up work agreements during 2020-2021. The project kick-off for the JEM pilot implementation phase took place at the end of November 2019, marking the beginning of the inception phase for the two pilot projects. Prior to this, development of the overall JEM Programme and its two pilot designs had taken nearly four years with costs of about USD 350,000: USD 170,000 from MRC basket funds and about USD 170,000 from GIZ earmarked funds.

2019 also saw the achievement of another key milestone when the MRC Council in Phnom Penh, Cambodia on 26-27 November 2019 approved funding of about USD 400,000 from the MRC Basket Fund to financially cover the actual monitoring of the JEM pilot projects in 2020 by the national routine monitoring teams of Cambodia, Lao PDR, and Thailand. It is anticipated that Working Agreements on the technical and financial implementation arrangements between MRCS, LNMCS, CNMCS and TNMC together with the line and implementing agencies of each MC will be agreed upon by February 2020 to pave the way for deployment of the national routine monitoring teams.

JEM Programme

The JEM Programme document (version 3.0) was completed in May 2019. The document describes the overall framework for the JEM data acquisition and sharing, including integration of JEM data into the MRC database systems and MRC routine monitoring in the long-term. For each of the five monitoring disciplines, considerations, best-practice methodologies, and recommendations for monitoring design (e.g., sites, parameters, frequency, timing, information management, etc.), monitoring protocols (i.e., standard operating procedures, measurement techniques, laboratory analysis, QA/QC, etc.) and subsequent data analysis, interpretation and reporting are described in detail. The document also includes equipment specifications and details on equipment deployment. With the recognition that hydropower projects can be uniquely different from each other, the JEM Programme document provides several monitoring options to choose from for each of the disciplines.

As per the major recommendations received during the national and regional consultations, the JEM Programme is designed to be consistent with the following requirements:

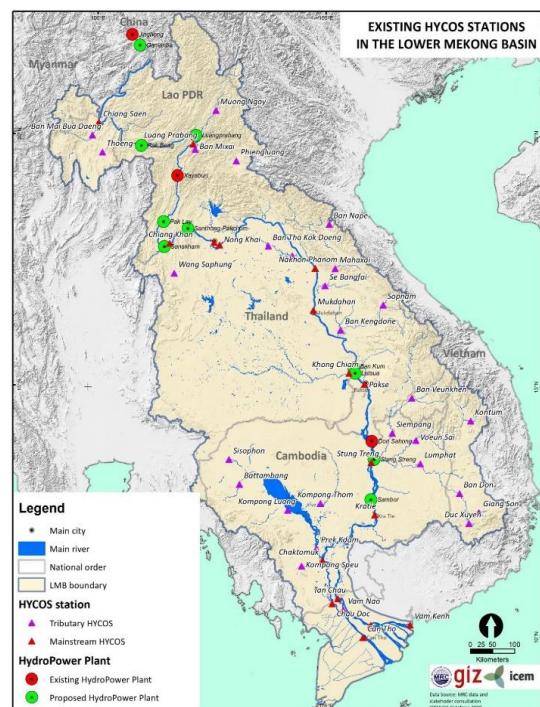


Figure 8: Map of HYCOS hydrometeorological stations in the Lower Mekong Basin

- Aligns with and complements developers' monitoring programmes;
- Integrates and interlinks the parameters among different disciplines to provide a clear view of impacts on individual projects and the basin;
- Ensures long-term sustainability of the JEM Programme without excessive additional burdens on MCs; and
- Is integrated with current MRC monitoring efforts and ensures data sharing with different stakeholders.

Pilot Project Proposals for Xayaburi and Don Sahong Hydropower dams

The pilot design for the Xayaburi and Don Sahong pilot projects have been finalized and were agreed upon during the EGEM meeting in Luang Prabang in May 2019. The implementation of the two pilots involves testing the proposed monitoring approaches for the five key environment disciplines mentioned earlier with the aim of testing, fine-tuning, and finalising the draft JEM Programme. The fisheries monitoring discipline includes several monitoring activities: the monitoring of fish abundance and diversity (FADM), larvae drift and juvenile monitoring, and the monitoring of fish passage efficiency and effectiveness. For the initial piloting, fish passage monitoring will be carried out only at the Don Sahong HPP.

The final objective of the JEM Programme is to determine the impacts of developments on the Mekong Basin. As the pilots have been designed to test the JEM Programme on existing infrastructure projects, the baseline data that will be used to inform and assess initial potential impacts and changes is the data that have been collected by the MRC at a basin scale for more than 25 years. With the routine monitoring data and the newly collected data at the project sites, initial assessments can be made and preliminary adaptive management measures proposed.

However, it is understood that to be able to fully understand the changes that the basin is undergoing due to specific projects, the long-term implementation of the JEM Programme, especially from the early stages of project planning and onwards, is necessary and will be carried out once the JEM Programme has been finalized and approved.

Below are the snapshot summaries of the pilot project designs.

Xayaburi Hydropower Dam

The Xayaburi dam is the third dam in the hydropower cascade of the six proposed mainstream projects in the territory of Lao PDR upstream of Vientiane. Xayaburi Hydropower Project (XBR) is located between Luang Prabang in its upstream reach and the potential Pak Lay project dam site downstream. Xayaburi is a run-of-river scheme designed to provide hydropower generation capability comprising seven turbine-generator units with a total of 1225 MW for export to Thailand, and one unit of 60 MW capacity for use in Lao PDR. Construction of the dam and powerhouse has created a 93-km long impoundment. The main facilities are the dam structure itself (820 m long, 32.6 m high, rated head of 18.3 m), the spillway for discharge of river flow greater than the powerhouse discharge capacity, sluices for bypassing of suspended sediment at the powerhouse inlets, a navigation lock, and fish bypass facilities.

The Xayaburi pilot design proposes to trial the draft JEM Programme for all five environmental monitoring disciplines by enhancing and expanding the current routine monitoring activities in the river reaches upstream (u/s) and downstream (d/s) of the project site. In order to do so, the Xayaburi pilot design proposes to add several new monitoring stations or locations and a few new monitoring parameters. New stations and locations include:

- one new manual hydrological monitoring station u/s of the current Luang Prabang station to assess the backwater effects of the impoundment and potential need for a new HYCOS station further upstream, and one new HYCOS station d/s at approximately 5-10 km of the HPP;
- to have one new sediment monitoring location at the new HYCOS station d/s of the dam site and to move the LPB monitoring location u/s to the new manual hydrological monitoring site, outside of the

backwater effects of the impoundment; to monitor the river cross-section at three new locations between Chiang Khan and Vientiane;

- to include five new Water Quality monitoring stations (one located within the dam impoundment, one u/s of the impoundment confluence and three d/s of which one should be before the dam wall (1.500 m) and one soon after the first significant tributary; the third should be in between these two);
- to include up to six new Aquatic Ecology monitoring sites of which one should be u/s of the impoundment area, one should be located within the dam impoundment area and four sites should be d/s of the dam. The d/s station locations should be similar to water quality sites with one close to the dam, in this case two between the next significant tributary and the dam and one after the first major tributary; and to identify and monitor fisheries (FADM & Larvae and Juveniles) at three new sites (one located within the dam impoundment, one u/s of the impoundment and one d/s of the dam site).
- The fish passage efficiency and effectiveness monitoring methodology has been included in the draft but is currently not expected to be piloted yet due to budgetary constraints.

The exact locations for each site were identified during the field surveys at the end of 2019. New monitoring parameters (on top of routine parameters that will be extended to the new sites) include bed load movement and photographic monitoring of riverbed morphology for Sediment Monitoring; Chlorophyll and Turbidity for Water Quality Monitoring; Phytoplankton for Aquatic Ecology Monitoring; and Larvae Drift and Juvenile monitoring in Lao PDR for Fisheries Monitoring.

Monitoring frequencies for routine Sediment and Ecological Health Monitoring are suggested to be increased, both for new stations and some current stations up and down stream of the dam site. Specifically, the Chiang Khan station will increase the sediment sampling frequencies during the pilot phase, the monitoring methodology will be updated, and new equipment will be bought. The Luang Prabang monitoring location for sediment will be moved u/s and sampling frequency will be increased too.

Don Sahong Hydropower Dam

Don Sahong Hydropower Plant (DSH) is a run-of-river scheme located in Lao PDR in the middle reach of the Mekong River in the southern area of Khong District, Champasak Province, 150 km downstream of the provincial capital, Pakse, about 2 km above the Lao-Cambodian border. This area is generally known as Si Phan Don (Four Thousand Islands): a relatively flat and level land surface into which the Mekong River has eroded seven main channels and numerous smaller channels forming a complex of islands along about 10 km of the Mekong. The Don Sahong Dam is located on one of the seven main channels: the 5 km-long Hou Sahong Channel. The power plant is proposed to have a nominal installed capacity of 260 MW, developed by discharging the design flow of 1600 m³/s operating at the rated head of 17.8 m. Power output will vary with the seasonal flow variation.

The Don Sahong pilot design proposes testing the draft JEM Programme for all five environmental monitoring disciplines by enhancing and expanding the current routine monitoring activities in the river reaches u/s and d/s of the project site. In order to do so, the DSH pilot design proposes to add:

- one new HYCOS station approximately 45 km d/s of the dam, (u/s of the 3S convergence) (partially covered by the HYCOS routine programme as location overlaps with HYCOS expansion);
- one new sediment monitoring location u/s of the 3S convergence, preferably where the new HYCO station will be installed; include cross section monitoring of dolphin pools in Cambodia; include four new Water Quality monitoring stations (one located within the dam impoundment);
- one site immediately u/s of the dam, one immediately d/s of the dam and one further d/s; include up to four new Aquatic Ecology monitoring sites, one site upstream and two sites downstream of the dam, immediately below the dam wall and on the edge of the next enlarged section of the stream and one site located within the dam impoundment;
- two new fisheries monitoring sites upstream and downstream of the Khone Falls to assess the effectiveness and efficiency of the modified channels for fish migration (fish passage monitoring).

The exact locations for each site were identified during the field surveys at the end of 2019. New parameters include bed load movement and photographic monitoring of riverbed morphology (sediment); Chlorophyll and Turbidity (Water Quality); Phytoplankton (Aquatic Ecology); Larvae Drift and Juvenile monitoring in Lao PDR and Cambodia (Fish); and fish passage monitoring (Fish).

Monitoring frequencies for routine Sediment and Ecological Health Monitoring are suggested to be increased, both for new stations and some current stations up and down stream of the dam site. Specifically, the Pakse station will increase sediment sampling frequencies during the pilot phase, the monitoring methodology will be updated, and new equipment will be bought. The new HYCOS station and sediment and discharge monitoring location u/s of the 3S convergence and Stung Treng will also increase sampling frequency. The Cambodian team will also be asked to carry out cross-section samples twice a year at the dolphin pools on the Cambodian side.

For fish passage monitoring, the international experts that will support the piloting process will assess and propose a fish pass monitoring methodology that will allow an understanding of the technical and financial strengths and weaknesses of the available technologies. This will then be piloted throughout the different river channels in the Si Pan Don area, a few of which will have to be located close to the dam site and the upper entrance of the project impoundment. The international experts will train and collaborate with Lao fisheries staff in fish capture and tagging, including fish surgeries.

EVIDENCE OF CHANGE

This major MRC undertaking would not have been successful in 2019 without the cooperation of the Lao Government and the MCs coming together to agree on the development and pilot testing of the proposed JEM Programme.

There is plenty of evidence that key actors (i.e. relevant line and implementing agencies), decision makers from all MCs and hydropower project developers, have transitioned from being aware of the issues to having more of a solid understanding not only of the need but also of the steps to be taken to address that need. This transition has allowed the project to make significant progress in 2019. This is particularly demonstrated by the Government of Lao PDR's deliberate yet proactive approach to making informed decisions on critical issues as described below.

On 26 August 2019, the LNMCS facilitated a meeting between MRCS, the Faculty of Natural Science of the National University of Laos, and relevant departments/offices under the Lao Ministry of Energy and Mines (MEM), the Ministry of Agriculture and Forestry (MAF), and the Ministry of Natural Resources and Environment (MONRE) to discuss the proposed approach for the pilot projects, including the detailed locations for the monitoring sites for all disciplines.

While the participants have expressed conformity with the proposed approach, MEM's Department of Energy Business (DEB) requested the MRCS to verify whether the monitoring locations fall within the hydropower developer's concession area as this will require coordination with the developer and their agreement. Once it was confirmed that the monitoring locations were outside the concession area, DEB, which is a signatory to the contracts between the hydropower developers and the Government of Lao PDR, on 23 September 2019 informed LNMCS that they had no objection to the implementation of the JEM pilots as proposed. In response, the MEM expressed its willingness to facilitate cooperation with hydropower developers if needed. This key decision milestone has led to LNMCS and relevant line and implementing agencies in Cambodia, Lao PDR and Thailand being able to carry out site surveys in November and December 2019 confirming the technical adequacy and logistical feasibility of the proposed monitoring locations.

Another noteworthy change is the increased awareness of government leaders of the importance of JEM and the increased pro-activeness to consider it for other projects. For instance, during the past two stakeholder forums for the proposed Luang Prabang Hydropower Dam, the Lao PDR MONRE Vice Minister made references about JEM and its importance in improving the management and operation of hydropower dams. The need to apply JEM has also been referenced in the Joint Action Plans for Pak Lay and Pak Beng, and Transboundary Environmental Impact Assessment Guidelines and Preliminary Design Guidance for Proposed Mainstream Dams in the Lower Mekong Basin.

To implement the JEM Programme successfully as a standardized regional monitoring program, active support, participation and buy-in are necessary from the relevant national line and implementing agencies. As per the outcome indicators, the ultimate evidence of change would be for MCs to adopt JEM in monitoring the environmental changes caused by national projects with potential transboundary impacts to support informed planning and decision-making for managing water resources projects.

CONTRIBUTION TO SDGs

The JEM Programme provides a framework to help MCs consider whether hydropower projects are having impacts, and if there are concerns, to build confidence about any proposals to implement adaptive management approaches for sustainability of these hydropower projects. Overall, the anticipated outcome is for MCs to adopt JEM in monitoring the environmental and fisheries changes caused by mainstream projects and conceivably other national and provincial projects with potential transboundary impacts to support informed planning and decision-making. Therefore, JEM will contribute to the achievement of the following UN SDGs:

Goal 1: No Poverty, specifically target 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.

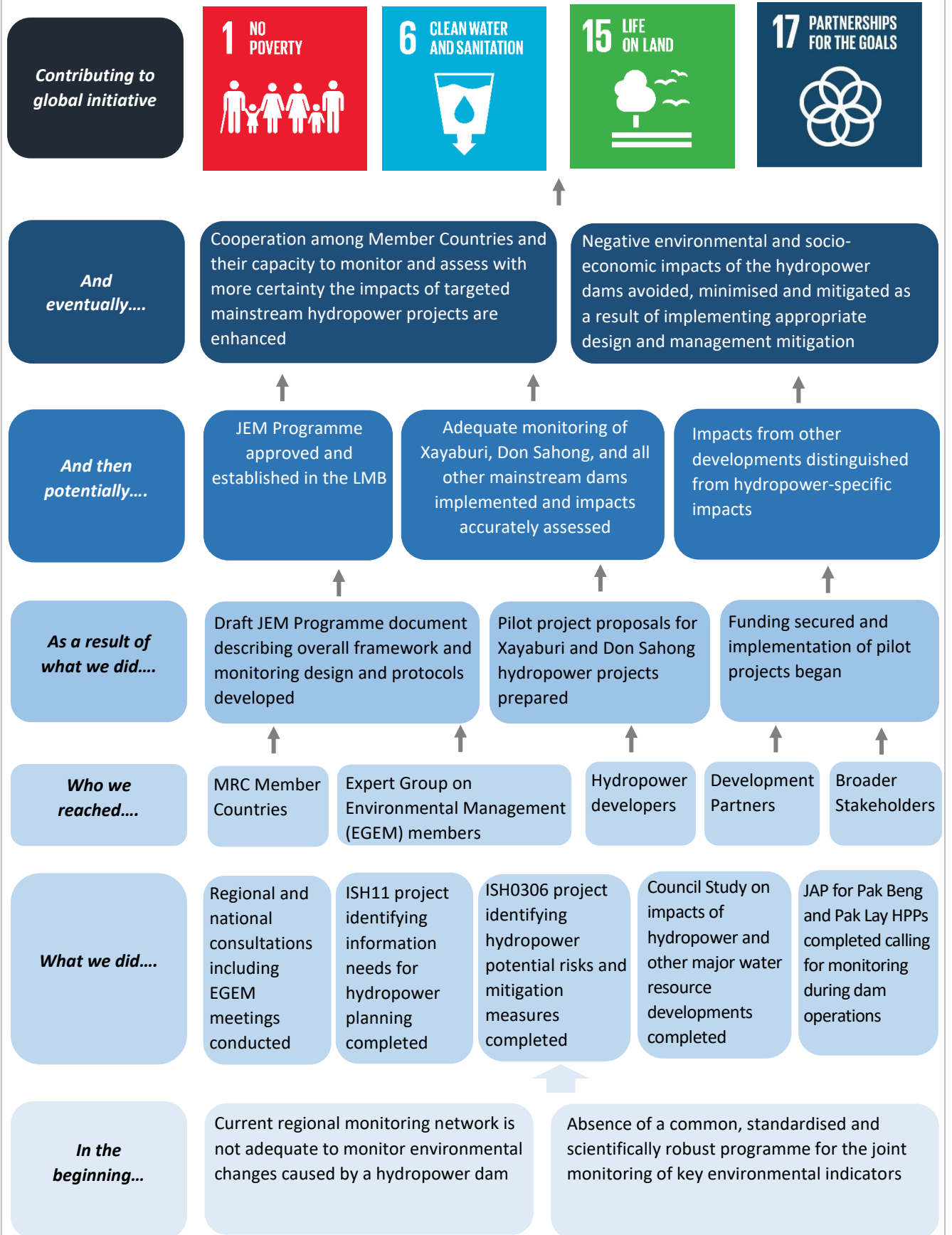
Goal 6: Clean Water and Sanitation, specifically target 6.5: by 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

Goal 15: Life on Land, specifically target 15.1: By 2020, 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.

Goal 17: Partnerships for the Goals, specifically target 17.9: Enhance international support for implementing effective and targeted capacity building in developing countries to support national plans to implement all the Sustainable Development Goals, including through North-South, South-South and triangular cooperation; and target 17.16: Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries.

Pathway to Change

Agreement on the Draft Joint Environment Monitoring Programme and Proposed Pilot Testing



OUTCOME 4

Successful conclusion of the PNPCHA Prior Consultation of Pak Lay Hydropower project

INDICATORS:

- Evidence of adverse transboundary impacts that were mitigated, minimised, or avoided in basin planning and management by using the MRC procedures
- Number of water utilisation projects notified and consulted on, and improved agreement under the consultation and notification process of PNPCHA

On 13 June 2018, the MRCS received notification from the Lao National Mekong Committee of their intention to submit the Pak Lay Hydropower Project (PLHPP) for prior consultation (PC) under the PNPCHA. The proposed PLHPP lies in Lao PDR's northwestern province of Xayaburi and is planned as a run-of-river project with an installed capacity of 770 MW. The six-month PC began on 8 August 2018 and concluded on 4 April 2019.

PLHPP is the fourth Mekong mainstream hydropower project that went through the PC. The PC for the first two mainstream hydropower dams Xayaburi and Don Sahong were conducted in 2011 and 2015, and since then both dams have been constructed and are now in full operation. While the PC led to desired changes in the original design of the Xayaburi Dam to address some of the concerns raised by the Member Countries during the PC, both PCs ended with no formal agreements among the Member Countries. This has changed with the PC of Pak Beng Hydropower Project in 2017 as it concluded with an agreed Statement by the Joint Committee. The Statement included key recommendations to avoid, minimise and mitigate potential transboundary impacts and increase potential benefits. The Statement also suggested the formulation of the Joint Action Plan (JAP), which is an innovative way to clearly identify the actions to ensure the Statement is implemented after the end of the six-month PC. The JAP also provides the MRC Joint Committee with a way to monitor its implementation as a post-PC process.

The JAP for the Pak Beng Hydropower Project was finally approved by the JC on 4 April 2019 during its Special Session on the Prior Consultation process for PLHPP in Vientiane, Lao PDR. Equally important was the approval of the Statement and the JAP for PLHPP on the same day. The speedy conclusion of the Pak Lay PC process demonstrates the increased confidence of the Member Countries on the mechanism of the Statement and the JAP to push for sustainable hydropower development in an open and inclusive approach.

PROGRESS

Following the six-month PC process for the PLHPP, the JC convened its Special Session to discuss PLHPP on 4 April 2019, in Vientiane, Lao PDR and issued a Statement to conclude the PLHPP's PC process. The JC also discussed and approved the JAP to implement the PLHPP Statement during the Special Session.

The Tracking Matrix to implement the JAP for PLHPP was formulated and agreed upon after discussions during the seventh meeting of the MRC Joint Platform on 9 October 2019, in Vientiane, and by the MCs in November 2019 as planned.

The conclusion of the PNPCA PC process involved the timely completion of several milestones during the 6-month period. These milestones as depicted in the Pak Lay PNPCA PC process roadmap include the following information sharing/consultations and stakeholder outreach:

- First Regional Information Sharing/Consultation Meeting held during the Fifth Regional Stakeholder Forum in Vientiane, Lao PDR on 20-21 September 2018
- Second Regional Information Sharing/Consultation Meeting held during the Sixth Regional Stakeholder Forum in Luang Prabang, Lao PDR on 17 January 2019
- Several national consultation meetings: two in Cambodia, three in Thailand, three in Viet Nam, and two in Lao PDR

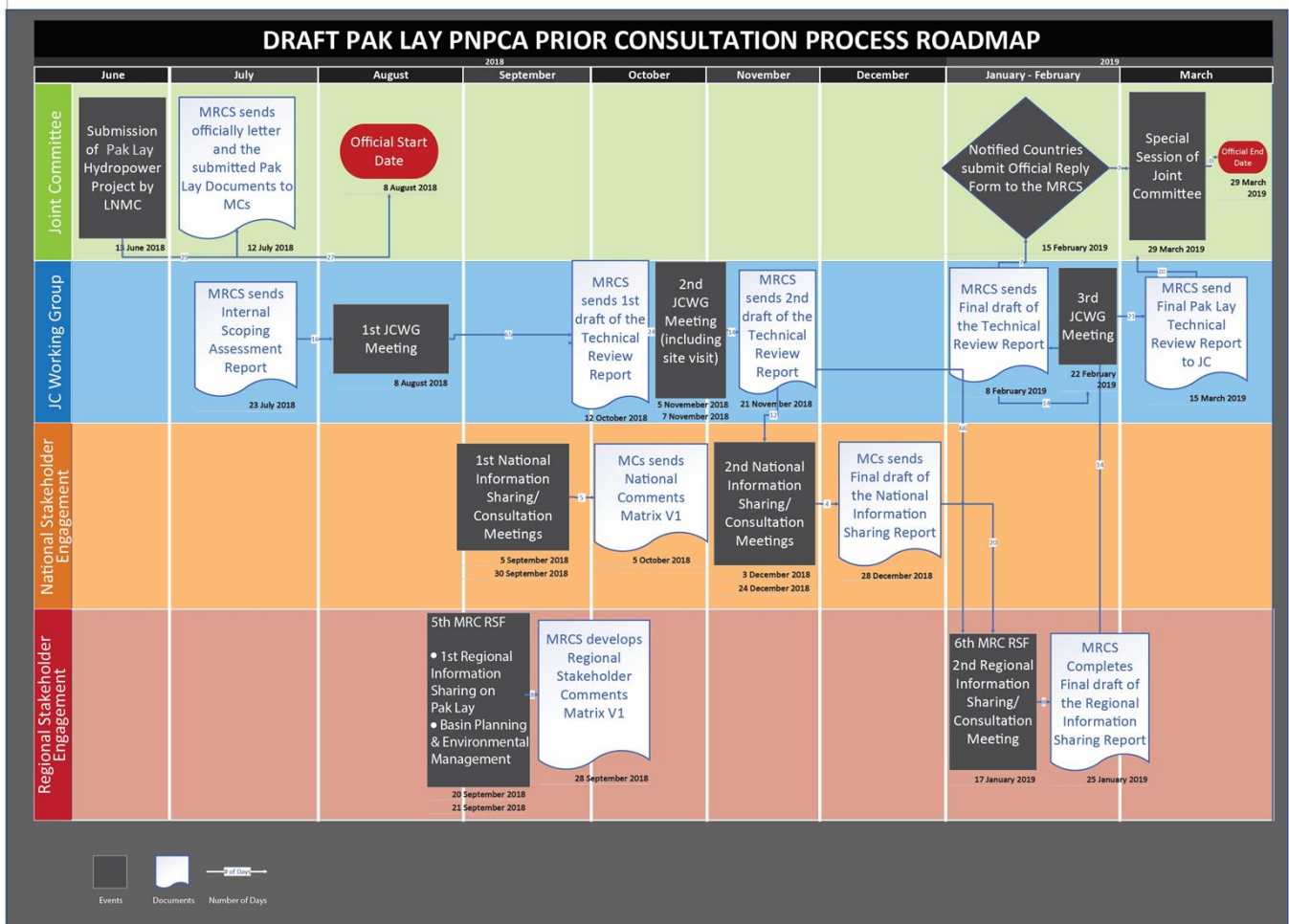


Figure 9: Draft Pak Lay Hydropower project PNPCA Prior Consultation Process roadmap

Statement for PLHPP

The JC Statement calls on Lao PDR, as the notifying country of the project, to make every necessary effort to address and mitigate potential adverse cross-border impacts by taking into account recommendations provided in the Technical Review Report resulting from the prior consultation process. The notified countries – Cambodia, Thailand and Viet Nam – also made their statements as to what exactly they wished Lao PDR to consider in order to improve the proposed project and address adverse impacts. The JC Statement specifically calls for measures to address impacts of the changed hydrology, increase the transport of sediment through the head pond, improve fish passage facilities, improve design safety, consider socio-economic impacts, increase safety of navigation facilities, maintain an open communication channel for inputs during the design and development, expand joint monitoring, and periodically share information such as monitoring data, detailed design updates and operating rules. Lao PDR, in an official response, underscored the country's commitment to addressing negative impacts raised and welcomed future engagement to improve the project. The JC member for Lao PDR Mr. Chanthanet Boualapa, stated during the April 2019 JC Special Session, "the Lao government is committed to addressing your key concerns and welcomes further engagement, information sharing, site visits and joint monitoring to ensure that the project does not cause significant transboundary impacts and provides benefits to all parties".

Joint Action Plan for PLHPP

The approved JAP consists of a four-phase approach, which is implemented throughout the life of the project. The purpose is to enhance existing measures to avoid, minimise and mitigate the potential for transboundary impacts, and to enhance the benefits of the project and the sharing of knowledge and experience amongst MCs. The JAP also lays out the projects' post prior consultation process and provides mechanisms for ongoing feedback, data exchange, and knowledge sharing between the Lao Government, its developer, and the MRC and stakeholders concerning the ongoing design, construction and operation.

EVIDENCE OF CHANGE

The introduction of, and agreement to the Statement of the JC and Joint Action Plan (see table below listing required actions) as concrete final outputs of the PNPCA PC process is important in elevating cooperation among the MCs during the PC process and ensuring the process' speedy, deliberate, and action-oriented conclusion. These outputs also represent the official agreed opinions of the four governments at the highest level thereby signifying their importance and urgency. While remaining largely based on the Technical Review Report (TRR), the proposed actions in the JAP provide the notifying country and hydropower developer the flexibility to do what is right and reasonable throughout the life cycle of the project in an open, transparent, consultative, and adaptive manner to avoid, minimise, and mitigate negative impacts of the hydropower project. There is clear evidence that this has resulted in increased confidence in the PC process and commitment from the notifying country.



Picture: Chairperson of the MRC JC for 2019, Dr. Le Duc Trung (left), and CEO of the MRCS, Dr An Pich Hatda (right), addressed the JC Special Session held on 4 April 2019 in Vientiane, Lao PDR to conclude the six-month prior consultation process for the Pak Lay hydropower project

During the Informal Development Partners Meeting in Vientiane, Lao PDR in June 2019, the development partners appreciated the innovative evolution of the PC process and congratulated the MRC for successful completion of the PLHPP PNPCA PC and its efforts to facilitate the involvement of different stakeholder groups. They also acknowledged the dedication of the Government of Lao PDR to the post-prior consultation process, through approval of the Joint Action Plans for the Pak Beng and Pak Lay hydropower projects.

As this is the fourth time the PNPCA PC has been applied for a mainstream hydropower project, the increased awareness and understanding of the process among all PC participants has led to more constructive interactions all round. There is increasing evidence that the developers are becoming more proactive, for example, by reviewing in advance the 2009 MRC Preliminary Design Guidance for Proposed Mainstream Dams in the Lower Mekong Basin to increase alignment of their designs to the PDG. The PLHPP developer (Power China) provided additional documents related to China's standards for dam safety in response to an MRCS request.

With Xayaburi, Pak Beng, Pak Lay, and Luang Prabang (in 2020) dams representing a cascade of dams, there is also an increasing recognition that cascade operation and management has become both a key issue to review and a management measure to consider in the JAP during the PC process. The Lao Government also recognizes this issue. Due to the important role in establishing best practices for cascade operation, the Lao Ministry of Energy and Mines is conducting a study with financial support from France, a development partner of MRC, and technical support from CNR on the feasibility of establishing a Coordination Monitoring Centre to serve as a state agency dedicated to the management of hydropower projects in Lao PDR including their multi-purpose use.

Finally, as demonstrated by the on-time conclusion of the PLHPP, it is anticipated that future PNPCA PCs will continue to benefit from the lessons learnt from these previous PCs leading to continuous improvements not only in the process but also in the performance of the hydropower dams themselves.

The MRC and its PNPCA will constantly be improved. But for now, most stakeholders acknowledge their importance. Writing for the NGO International Rivers’ Expert Commentary on the “MRC Review of Design Changes for the Xayaburi Hydropower Project”, Dr. Oliver Hensengerth stated: the MRC “provided a forum for discussion and conflict resolution that was observable in real time by civil society organisations, media, donors, academics and other interested parties. Without the MRC and its PNPCA process, there would have been a lack of procedures and guidelines to facilitate regional discussion of the impact of large-scale infrastructure. There would also have been a lack of transparency in planning, publicly accessible project documents, and various forms of research, which were made available via the MRC website. The MRC, therefore, provided an important channel of communication, discussion, research, and information dissemination.”

Table 6: Pak Lay Hydropower project Joint Action Plan scope of work.

Phase	Key Activities
Initiation	<ul style="list-style-type: none"> • Mobilise resources required for implementation; • Inform stakeholders of the outcomes of the prior consultation process and the content of the JAP; • Initiate implementation of the JAP within the MRC and the GoL. This will include agreement in the JC on the modalities of collaboration, and lines of communication and reporting; and • Development of a Monitoring/Lessons Learnt Matrix, to be maintained by the MRCS, so that the JC can exercise effective oversight over the implementation of the JAP.
Project Design (including Operating Rules)	<ul style="list-style-type: none"> • Establish mechanisms to maximise the technical expertise available to support implementation of the Statement. This may for example include the appointment of monitoring expertise by the GoL, and opportunities to engage MRC and MC experts; • Working sessions at key design milestones bringing together relevant expertise around the following subjects: <ul style="list-style-type: none"> - Dam safety; - Sediment flushing infrastructure and operations; - Dam release infrastructure, regulation and operations; - Fish passage infrastructure and operations; - Navigation lock infrastructure and operations; and - Positive and negative impacts on socio-economic issues. • Working sessions to gain a better understanding of potential transboundary socio-economic and ecological impacts, and options to further reduce these as far as reasonably practical; and • After review by the JC, making recommendations on the project design and operating rules for the GoL to consider.
Construction	<ul style="list-style-type: none"> • Periodic visits to the site by MRCS and MC experts to observe the process. These visits will be arranged through the GoL;

Phase	Key Activities
	<ul style="list-style-type: none"> • Working sessions or meetings to discuss any major design changes made during the construction phase; • Exchange of data on the efficacy of measures agreed to avoid, minimise and mitigate impacts during construction; and • Regular updates on progress of construction, provided via the LNMC and MRCS as outlined in the following section.
Operations	<ul style="list-style-type: none"> • Monitor daily changes in water levels in the impounded reach, and downstream of the dam; • Monitor water quality and ecological impacts; • Monitor transboundary and cumulative impacts on fish and fisheries (with assistance from the MRC Secretariat); • Monitor the efficacy of the fish passage facilities, including navigation locks; • Monitor sediment volume trapping in the impoundment area; • Monitor suspended sediment concentrations downstream through PLHPP; • Monitor the number of vessels using the locking system and waiting times; • Monitor any cavitation damage in the ship lock structure; • Sediment deposits which can occur at the upstream and downstream approach channels; and • Warn shipping, the MRC and the MCs in the event of a dam break or water level changes.

CONTRIBUTION TO SDGs

The PNPCA, and in particular the PC process for the hydropower projects on the mainstream of the lower Mekong, provide an opportunity for a consultative process among the MCs to identify and implement hydropower design and management measures to avoid, minimise, and mitigate adverse transboundary impacts. The introduction of the Statement of the JC and Joint Action Plan as concrete final outputs of the PNPCA PC process has elevated cooperation among countries thereby increasing the PNPCA contribution to a sustainable Mekong. Therefore, the PNPCA will contribute to the achievement of the following UN SDGs:

Goal 6: Water and Sanitation, specifically target 6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

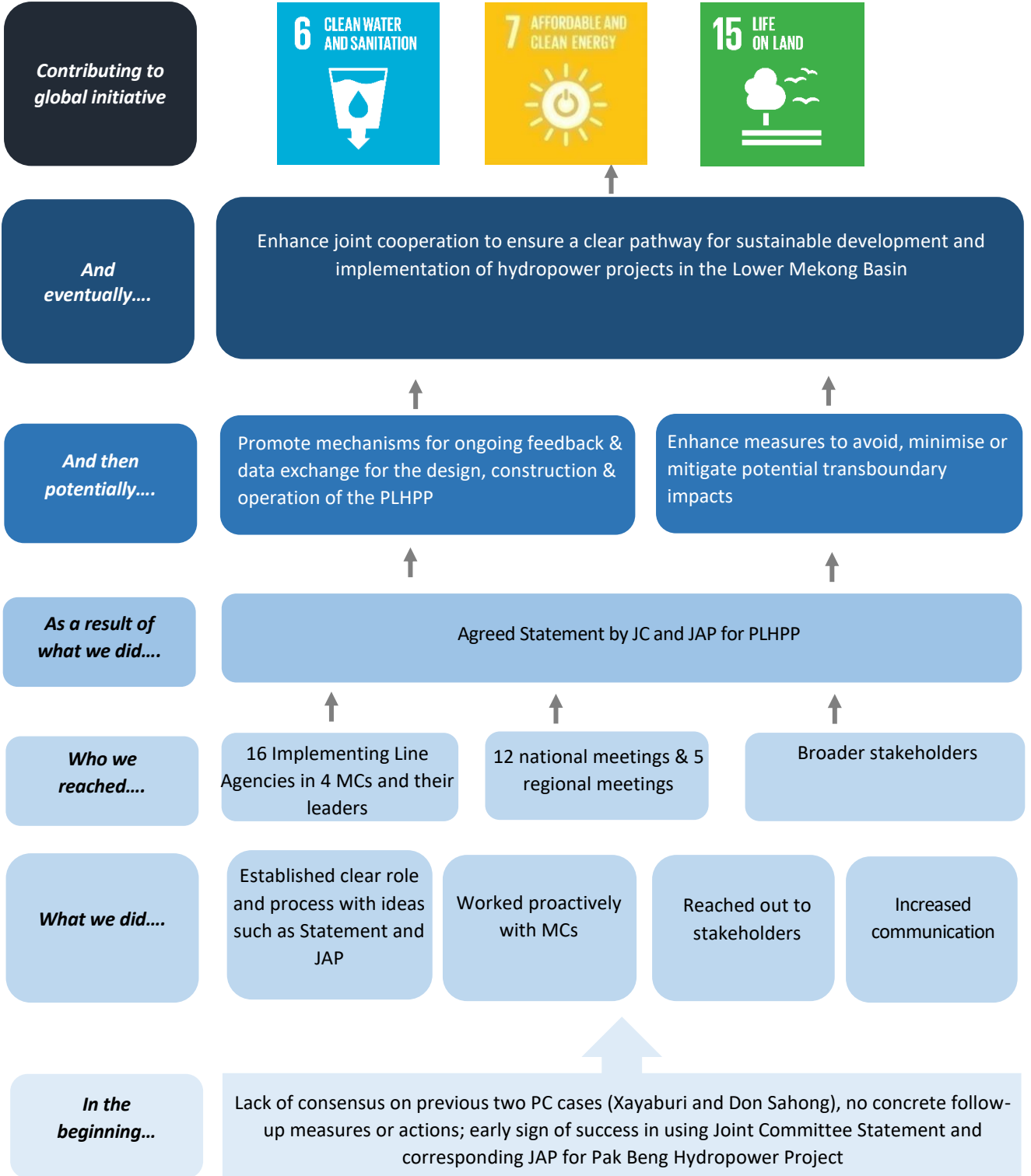
Goal 7: Affordable and Clean Energy, target 7b: By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support.

Goal 9.1: Develop quality, reliable, **sustainable and resilient infrastructure**, including regional and trans-border infrastructure, to support economic development.

Goal 15: Life on Land specifically target 15.6: Promote fair and equitable sharing of the benefits arising from the utilisation of genetic resources and promote appropriate access to such resources, as internationally agreed.

Pathway to Change

Successful Conclusion of the PNPCA Prior Consultation of Pak Lay Hydropower Project



The background of the page is a photograph of a wide, brown river with several small, dark-colored boats on the water. The boats are scattered across the frame, some in the foreground and some further away. The water has a textured, rippled surface. The overall tone is warm and natural.

OUTCOME 5

Reaching New Heights in Cooperation, Partnerships and Stakeholder Engagement in the Mekong Basin

INDICATORS:

- Number of deals and agreements to secure specific cost and benefit sharing arrangements especially joint projects among riparian countries
- Evidence of strong engagement with China and Myanmar
- Evidence of ASEAN and GMS Mekong related strategies, forums and meetings reflect MRC basin-wide perspectives
- Evidence that the opinions/perspectives of academic/research institutions, civil society and private sector are taken into consideration by MRCS and Member Countries
- Extent of continuing dialogue of MCs to resolve critical basin issues and challenges.

The MRC recognizes that its success in delivering its 1995 Mekong Agreement mandate is very much predicated on its ability to promote effective dialogue and cooperation not only among MRC Member Countries but also the strategic engagement of its regional partners and stakeholders. While the Member Countries have in recent years demonstrated an unprecedented high level of cooperation among one another and the development partners have continued to strongly provide their support, the MRC has also achieved significant progress in its pursuit of strategic and practical collaboration with its Dialogue Partners in the Upper Mekong – China and Myanmar – including with and through a stronger engagement with Mekong-Lancang Cooperation. MRC's strategic efforts to pursue broader collaboration have also resulted in a growing list of strategic and technical partners internationally who are strongly interested in contributing to a sustainable and secure Mekong region. Such efforts include the revitalization of longstanding partnerships such as that with the Murray--Darling Basin Authority in Australia and the strengthening of ongoing partnerships such as those with the U.S. Army Corps of Engineers and the Mississippi River Commission in the U.S.

PROGRESS

Advancing cooperation with China and the Mekong-Lancang Cooperation

Since 1996, the MRC and China as a Dialogue Partner, have cooperated in several ways including annual dialogue meetings, data and information sharing, joint symposiums, joint studies, and technical exchanges on water resources development, environmental protection, flood and drought, and hydropower development. Building on these past efforts, the cooperation with China registered multiple achievements in 2019 that included several exchange visits, China's agreement to continue providing hydrological data during flood season, and the completion of a report on joint research between the MRC, China, and IWMI on the hydrological impacts of the Lancang dam cascade on extreme floods and droughts.

The data sharing agreement signed by the Consul (DG level) of China's Ministry of Water Resources on July 17, 2019 in Beijing, and the MRCS CEO was a renewal of past agreements in 2002, 2008, and 2013. The joint research report was discussed at the Dialogue Meeting in September 2019 and disseminated during the MRC Regional Stakeholder Forum in November 2019.

Information exchange visits included a first ever high-level visit to China by the MRC Council of Water and Environment ministers from the four MCs in December 2019 to demonstrate the high-level commitment, goodwill, and desire for sincere cooperation with China from the four lower Mekong countries. To demonstrate their continuing commitment to the MRC and cooperation with the Mekong-Lancang Cooperation (MLC) mechanism, the visit coincided with the first Ministerial Meeting of the MLC Water Resources Cooperation (MLC Water), in which the four Mekong ministers and ministerial representatives joined their counterparts from China and Myanmar. As significant was the MOU between the MRCS and the Lancang-Mekong Cooperation (LMC) Water Center was signed on 17 December 2019 during the meeting. The signing of the MOU, which had been under discussion for nearly two years was a critical milestone for further strengthening the cooperation between the MRC and MLC.



Picture: MRC CEO, Dr An Pich Hatda, signed the MOU with Dr Zhong Yong, Secretary General of the LMC Water Center in Beijing

Last but not least, the MRC Secretariat was granted observer status at the Joint Working Group and was invited to join the 3rd Special Meeting of the Group for the first time on 29-30 October 2019 in Guangdong, China. The head of delegations at this meeting included Mr Chanthanet Boualapha of Lao PDR (also JC

Member for Lao PDR), Dr Somkiat Prajumwong of Thailand (also JC Member for Thailand), and Dr Le Duc Trung of Viet Nam (also JC Member for Viet Nam).



Picture: MRCS Chief of Strategy and Partnership, Dr Anoulak Kittikhoun, at the 3rd Special Meeting of the Mekong-Lancang Cooperation Joint Working Group on Water Resources Cooperation on 29-30 October 2019 in Guangdong, China

This high-level meeting was preceded by several invitations to the MRC to participate in meetings and exchanges to build understanding and relationships among those working on cooperation at the MRC and MLC. This included the Second Global Center for Mekong Studies Think Tank Forum on 21-22 March 2019 in Vientiane; the Lancang-Mekong Roundtable Dialogue on the Outlook for Strategic Environmental Assessment (SEA) by Lancang-Mekong Environmental Cooperation Center in Kunming on 20-22 March 2019; the high-level 2nd Belt and Road Initiative (BRI) Forum in April 2019 (invited but could not attend); the China-ASEAN Countries Workshop on Flood Control, Drought Relief and Integrated Water Resources Management by the LMC Water Center on 4-8 August 2019 in Yunnan province; and the Workshop on Integrated Planning and Management of River Basin by the LMC Water Center in Guanzhou in November.

Increased information sharing and coordination on Mekong cooperation

With the recent burgeoning of Mekong related cooperation frameworks, the MRC, which has a clear mandate for promoting and coordinating the sustainable development and management of the Mekong water and related resources, had made numerous efforts to strengthen cooperation with these frameworks as well as to provide a platform for information sharing and coordination among them on water and related issues. On 15 August 2019 in Phnom Penh, Cambodia, during its 2nd Expert Group on Strategy and Partnership meeting, the MRC brought together senior representatives from the Mekong countries and seven major Mekong related regional cooperation frameworks for the first time to discuss and explore opportunities for improved coordination and collaboration. The organisations and cooperation frameworks that were represented included the ASEAN Secretariat, ADB (supports the Greater Mekong Subregion Economic Cooperation Program), Ayeyawady-Chao Phraya-Mekong Economic Cooperation Strategy, Mekong-Japan Cooperation, Mekong-Korea Cooperation, Lower Mekong Initiative and the Mekong-Lancang Cooperation. The participating organisations presented the status of their ongoing and future projects and programs in the

water, energy, disaster and environment related fields in supporting the Mekong countries. The Chair of the meeting, H.E. Mr Te Navuth of Cambodia and Co-Chair CEO An Pich Hatda of the MRCS agreed that overlapping of activities between the frameworks is unavoidable, but what is vital is to create a more coherent and effective coordination mechanism that ensures joint efforts.

Added value from cooperation with other partners

Year 2019 also marked yet another strong indication of the continuing strategic partnership between the MRC and the Mississippi River Commission (MiRC), which is technically supported by the US Army Corps of Engineers (USACE). From 17-24 August 2019, a senior delegation of the MRC JC and MRCS participated in a week-long exchange visit in the U.S. with MiRC and USACE featuring presentations and discussions on critical topics such as flood management, sediment modelling, fish mitigation, transboundary cooperation and benefit sharing. By attending a public hearing meeting in Vicksburg (Mississippi), the delegation learned first-hand how MiRC is using the public hearing process to increase community participation.

The renewal of the MOU between Murray-Darling Basin Authority (MDBA) and the MRC to collaborate on many areas including Mekong basin-wide planning, environmental monitoring, flood and drought management, climate change adaptation and stakeholder engagement was yet another significant accomplishment in 2019. The MOU revitalizes the technical cooperation between the two basins which began in 1996, one year after the MRC was established. The signing was held as part of MRCS and MCs as well as Myanmar senior energy officials participation in the first Mekong-Australia Energy Policy Dialogue, hosted by Australia's Department of Foreign Affairs and Trade in Melbourne, Canberra, and Sydney from 2-7 June 2019.

Of note also during 2019 was the completion of the Study on Basin Management and Environmental Conservation in the Mekong River Basin with Japan's International Cooperation Agency in July 2019 and its dissemination during a regional seminar in July 2019, in Vientiane, Lao PDR; Cambodia with support from the MRC, hosting the 8th Asia-Europe Sustainable Development Dialogue (ASEM-SDD) on Enhancing Water Partnership towards Sustainable Development and Inclusive Growth on 19-20 September 2019 in Siem Reap, Cambodia; the MRC CEO making an official visit on 4 October 2019 to Morocco, which is MRC's first development partner in Africa, on the invitation of the country's Secretary of State for Foreign Affairs to discuss ongoing collaboration and future initiatives notably in renewable energy and ecotourism; the signing of a new MOU between the MRC and the United Nations Environment Program on November 2019 to facilitate cooperation on water quality monitoring, exchanges and capacity development; and finally the MRC CEO participating in the 23rd Ministerial Conference of the Greater Mekong Sub-region (GMS) on 17-18 November in Phnom Penh to pursue the renewal of collaboration between MRC and GMS through the ADB.

Continued stakeholder engagement and outreach

MRCS has maintained engagement with diverse stakeholder groups that include international NGOs (Oxfam, International Rivers), regional and national river networks and coalitions (Save the Mekong, Viet Nam River Network, NGO Forum in Cambodia, Rivers Coalition in Cambodia, Living River Association, Green Community Alliance), civil society organisations, academia and the private sector. It also hosted and participated in numerous events in 2019 as part of its stakeholder outreach.

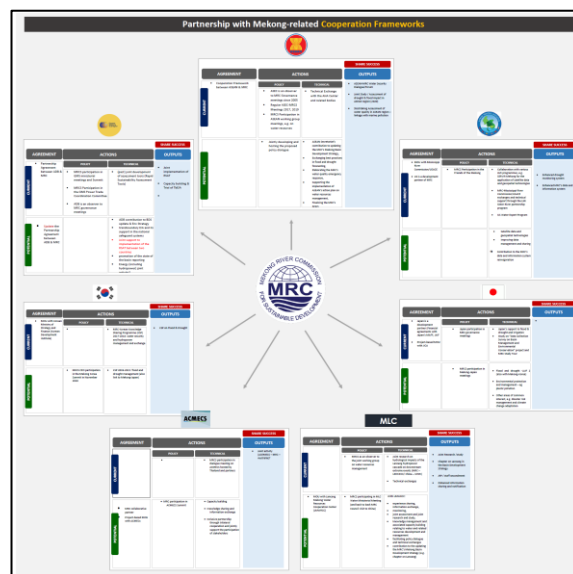


Figure 10: Mekong-related Regional Cooperation Frameworks

Under its institutionalized and standing Regional Stakeholder Forum, MRCS hosted the 6th MRC Stakeholder Forum on “2nd Regional Information-Sharing Meeting on the Pak Lay Hydropower Prior Consultation Process” on 17 January 2019; the 7th MRC Stakeholder Forum on “Mekong transboundary integrated water resources management” on 20-21 May 2019; and the 8th MRC Stakeholder Forum on the State of the Basin Report, the Basin Development Strategy Update, and the proposed Luang Prabang Hydropower Project on 5-6 November 2019 in Vientiane, Lao PDR, which attracted hundreds of participants from a broad range of stakeholders.

In addition, the MRCS invited specific groups to the MRC HQ for ongoing dialogue, including hosting on 20 March 2019 and 4 November 2019 the Save the Mekong Coalition for dialogue on Mekong river issues. The MRCS also participated in the First Mekong Dialogue: Transboundary Water Resources Management in the Mekong Region in Chiang Rai on 7-9 October 2019 and the Mekong Research Forum in Hanoi, Viet Nam on 16-19 December 2019.

Continued strong support from all development partners

MRC’s continuing partnerships with development partners have enhanced the organisation’s capacity not only in terms of its financial wherewithal but in terms of management and technical expertise, internal processes and operations, and strategic planning and project management. In addition to existing funding for the MRC SP 2016-2020 period from Australia, Belgium, the European Union, France, Germany, Japan, Luxemburg, Netherlands, Sweden, Switzerland and the World Bank, in 2019, Australia provided additional USD 500,000 to the Basket Fund as well as AUD 430,000 to eWater for technical support for reinvigoration of MRC data, information, modelling, forecasting and communication systems for 2019-2020. Germany contributed an additional EUR 2 million to the MRC for 2019-2023. The United States provided USD 60,000 for the Exchange visit to Mississippi. China (Permanent Representative to ESCAP and MRC) contributed USD 30,000 for the Council Visit to China.

EVIDENCE OF CHANGE

Evidence of positive changes and benefits resulting from MRC’s continuous pursuit for effective dialogue and cooperation with its regional and international partners include increased awareness and common understanding among partners of the critical basin issues and challenges; increased capacity of MRCS staff and MCs as a result of technical information exchanges, exchange visits, and workshops; improvements in MRC processes as a result of lessons and best practices learned from other cooperation frameworks and other basin organisations; and increased funding as a result of both new and emboldened commitments from development partners.

The renewal of the data sharing agreement with China in July 2019 is critical as it helps continue MRC’s river water monitoring and flood forecasting capability, and timely notification and support to implement management measures. In addition to sharing hydrological data during the flood season, China has also agreed to notify MRC and Mekong countries of abnormal rises and falls in water level and discharge from the Jinghong Dam that may have an impact downstream. There were two specific instances in 2019 that demonstrated the importance of these notifications: 1) a temporary 50 percent reduction in the outflow of the Jinghong hydropower Dam over a week-long period in April 2019 to accommodate the traditional activities on the Lancang river during the Water Splashing Festival of the Dai ethnic group; and 2) a temporary 25-45 percent reduction in the outflow of the Jinghong hydropower Dam over a 5-day period in August 2019 to accommodate maintenance for the transmission lines of the power grid. These notifications allowed the MRC to perform the necessary hydrologic analysis to determine any corresponding decrease in water levels downstream that may have an impact on river communities along the Mekong river. In both cases, the MRC was able to determine with confidence that appreciable changes in water levels were limited in Chiang Saen, Thailand.

The recently signed MOU between LMC Water Center and the MRCS at the end of 2019 is largely a result of MRC’s water diplomacy and outreach to China, and with strong support from MCs, to promote synergy rather than duplication and even competition with the MLC Water. The technical areas of collaboration covered by the MOU include experience sharing, data and information exchange, basin monitoring, joint assessment and

study, knowledge management, and associated skills building and training. The MOU has led to MRCS and LMC Water Center to agree to conduct joint research on the 2019 drought and low flow situation in the Mekong-Lancang river basin to determine the cause and impacts, and identify management and coordination measures, including coordinated cascade operations of the hydropower dams, to effectively respond to similar drought conditions in the future. The 2019 drought represented the lowest water levels in the Mekong river in over 60 years.



Picture: Senior delegates from the MRC JC and MRC Secretariat participated in a week-long exchange visit with the Mississippi River Commission from 17-24 August 2019

The newly signed MOU with MDBA yet again presents many opportunities to directly learn from another basin organisation facing similar basin challenges related to flooding, climate change adaption, and stakeholder engagement.

Information exchange with MiRC and USACE allowed the MRC delegation to learn and experience first-hand how the U.S. uses the public hearing process to engage their communities closely in shaping management and policy on the river. This immediately led to the addition of the JC/CEO panel session as an agenda item in the MRC Regional Stakeholder Forum, beginning with the Eighth MRC Stakeholder Forum in Vientiane on 5-6 November 2019, in order to continue to strengthen MRC's decision-making by connecting directly one group of decision makers (the MRC JC) with the public.



Picture: The MRC JC members and CEO fielded questions and comments from stakeholders in November 2019, with facilitation by the MRCS Chief Strategy and Partnership Officer

The Mekong-Australia renewable energy dialogue was yet another opportune experience for senior leaders and decision makers from the MRC MCs to learn the breadth of experience and innovation Australia has to offer in the renewable energy sector. This experience, including how to deal with enormous challenges both in Australia and the Mekong, and new knowledge gained could influence national energy policy- and decision-making in the Mekong region that may prove to have a lasting impact on the sustainability of the basin. The immediate feedback from participants was positive and encouraging. H.E. Keo Rattanak of Cambodia, the Minister attached to the Prime Minister and the current Managing Director for Electricite du Cambodge has noted that the discussion on renewable energy, like solar and wind power, is relevant to Cambodia as it wants to build a cleaner energy that is healthy to the environment and affordable for the people. Dr. Daovong Phonekeo, who was the Permanent Secretary (and now Vice Minister) of the Lao PDR Ministry of Energy and Mines, also noted that the new information and knowledge around how to increase the share of renewable energy in Australia is inspiring and important to Lao PDR.



Picture: The MRC visit to Australia included two key senior energy officials from Cambodia (Minister Keo Rattanak – middle) and Lao PDR (Vice Minister Daovong Phonekeo – right)

Finally, there is evidence of a broader range of actively engaged stakeholders as a result of increased stakeholder efforts by MRC and stronger commitment for an open, transparent and inclusive process. In addition to holding RSFs, the MRC stakeholder efforts include the following among many others:

- Regular update of the MRC website to communicate important MRC and Mekong events, and disseminate key products (e.g., 38 news releases)
- Facebook campaigns, competitions and livestreams of important events such as the three MRC RSFs in 2019
- Hundreds of posts on the MRC Facebook page, Twitter and LinkedIn. MRC Facebook page

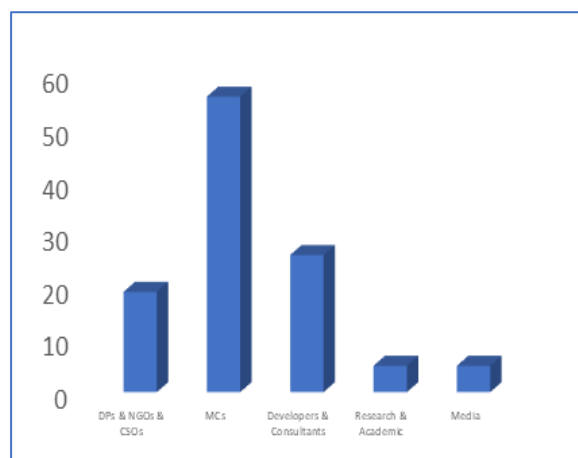


Figure 11: Level of stakeholder participation at the 6th Regional Stakeholder Forum

- received about 100,000 page likes by the end of 2019, 45,000 of which were new in 2019
- Several outreach events, including Green Campaign “Let’s Act Green for a Greener Mekong”, brown bag lunch events, Mekong 2030 project that supports five films on the future of the Mekong, and study visits to the MRC by students from undergraduate and graduate programs from around the region and the world.

These efforts have resulted in about 1,040 media pieces (i.e., the MRC was quoted or mentioned in the news) and numerous instances of positive feedback. For example, satisfaction surveys conducted during the regional stakeholder forums showed a level of satisfaction between 80 – 90 percent. The surveys were drawn from a broad cross-section of participants from government, media, civil society, academia, the private sector, and development partners.

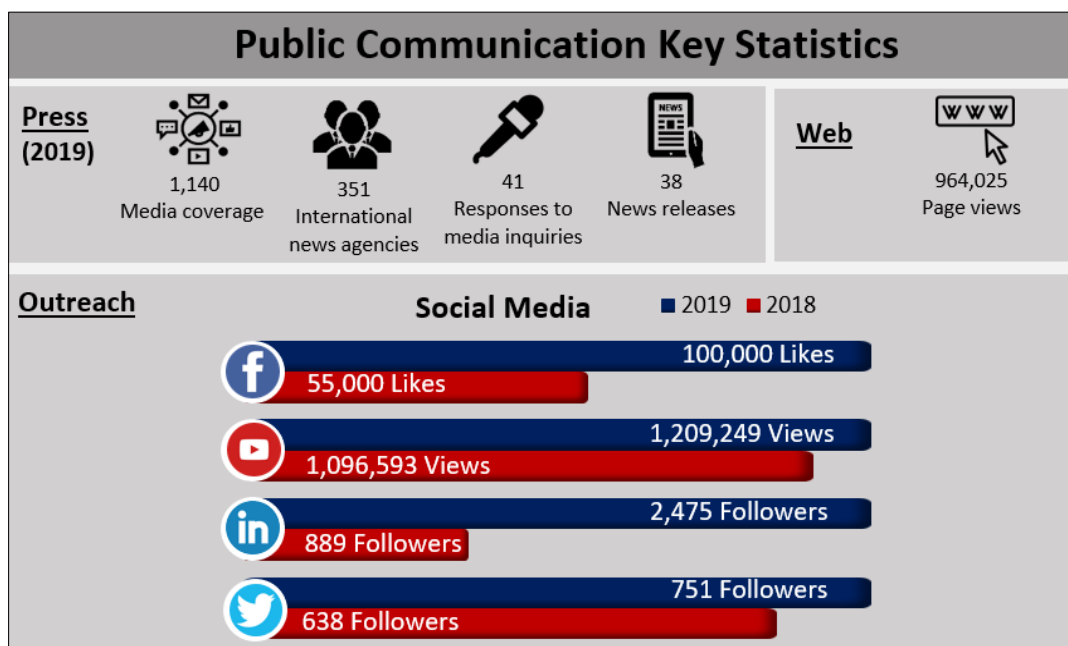


Figure 12: Key statistics indicating the MRC’s stakeholder outreach efforts

CONTRIBUTION TO SDGs

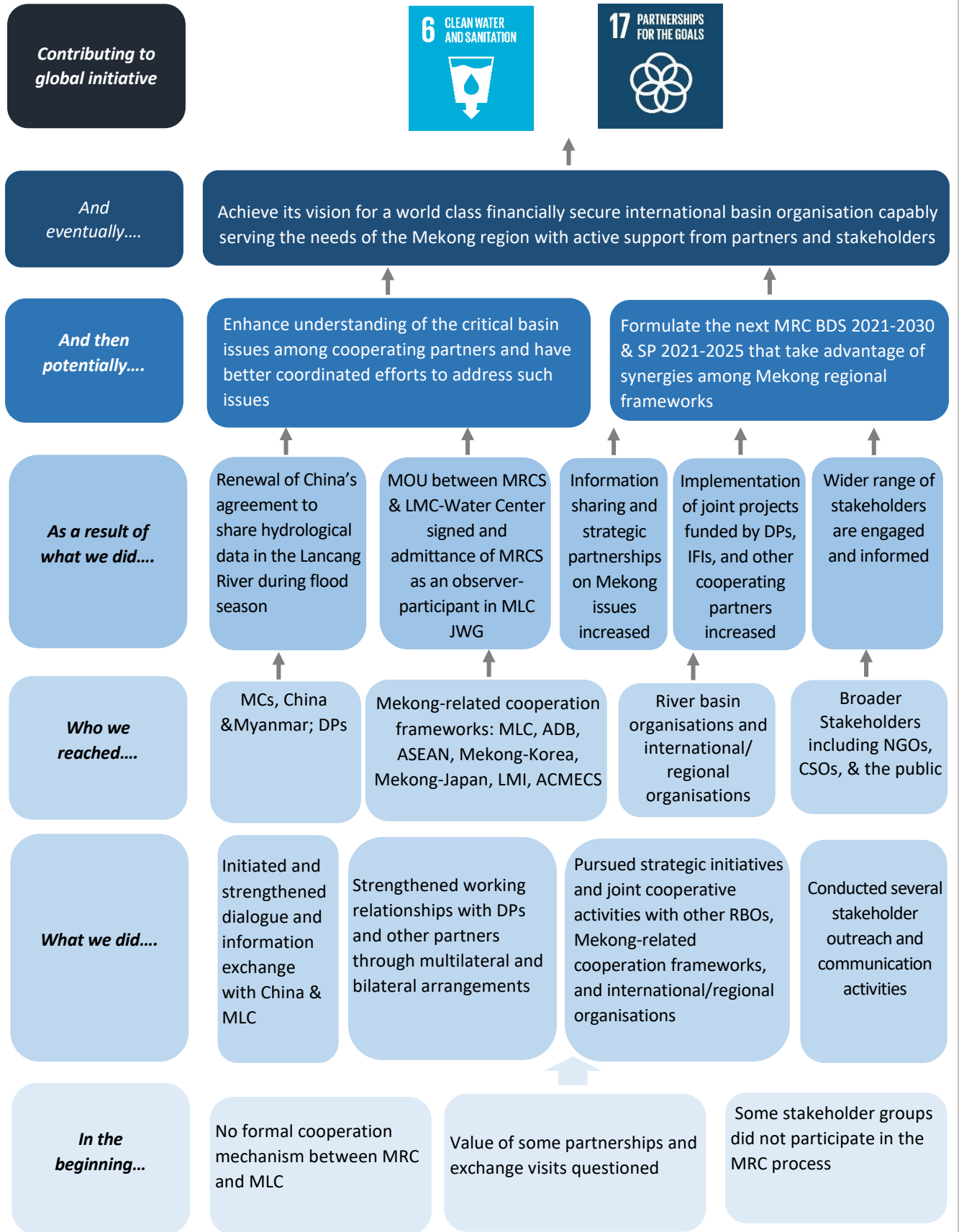
MRC’s commitment and continuous pursuit for effective dialogue and cooperation with its regional and international partners enables it to deliver meaningful contributions to the Mekong Basin as per its 1995 mandate. This can contribute to the achievement of the following SDGs:

Goal 6: Water and Sanitation, specifically target 6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

Goal 17: Partnerships for the Goals, specifically target 17.9: Enhance international support for implementing effective and targeted capacity building in developing countries to support national plans to implement all the Sustainable Development Goals, including through North-South, South-South and triangular cooperation; and target 17.14: Enhance policy coherence for sustainable development.

Pathway to Change

Reaching New Heights in Cooperation, Partnerships and Stakeholder Engagement in the Mekong Basin



OUTCOME 6

Monitoring, Forecasting and Dissemination of Basin Conditions in the Context of Low Flows, Floods, and Droughts

INDICATORS:

- The extent to which Line / Implementing Agencies use MRC reports and information systems for better decision-making
- Quality (timeliness and accuracy) of MRC forecasting information in critical or emergency situations.

Since a very large flood in 1996, the MRC has been monitoring hydrologic conditions in the LMB not only in support of its historical core planning and management functions but also to provide forecasting services for potential flooding, and more recently for drought conditions in the basin. In 2016, the Regional Flood Management and Mitigation Centre (referred to as the Regional Flood Centre) was established in 2006 in Phnom Penh, Cambodia to serve as the lead entity for the MRC in delivering flood forecasting services. In early 2019, the Regional Flood Centre, which remained in Phnom Penh after MRC's restructuring, was renamed as the Regional Flood and Drought Management Centre (RFDMC) to accurately reflect its expanded scope of services. This event signified MRCs' heightened efforts to address flood and drought issues in the Mekong region in an integrated manner and take advantage of the significant improvements in the capability of the centre to provide faster and accurate flood and drought forecasting and early warning information throughout the year to potentially impacted communities. These improvements are consistent with the MRC's strategic initiatives to strengthen its operations and reinvigorate its underlying information and related systems to improve delivery of its core river basin management functions.

RFDMC services fall under four components: 1) River monitoring; 2) River flood forecasting; 3) Flash flood guidance; and 4) Drought forecasting and early warning. Crucial to the effective delivery of these services is maintaining at a high level the reliability of the underlying technological infrastructure of these services, such as the Mekong-HYCOS Hydromet network for monitoring and MRC's websites for communicating forecasts and early warnings not only to Member Countries but directly to the public. In his remarks during the MRC JC Meeting in Vung Tau City, Viet Nam on 25 April 2019, the JC Chairperson, Dr. Le Duc Trung aptly pointed out that "the centre, as MRC's answer to the call for the organisation to be agile and responsive to the changing context of the basin and its vulnerability to more extreme weather events due to climate change, has to be equipped with advance technologies and appropriate capacities to perform effectively."

PROGRESS

The year 2019 saw several milestones completed in the upgrade, operation and maintenance of the supporting monitoring and communication infrastructure; the timely delivery of both routine and emergency monitoring and forecasting services; and the development and dissemination of routine flood and drought products such as bulletins, reports, and advisories.

The current Mekong-HYCOS Hydromet network, which provides basin-wide automated and near real-time water level and rainfall data, now includes 45 HYCOS stations and 13 new drought stations on the Mekong mainstream and major tributaries. These include 12 HYCOS stations each in Cambodia and Lao PDR, 11 in Thailand, and 10 in Viet Nam. Corresponding numbers for drought stations are three in Cambodia, five in Lao PDR, and five in Viet Nam. Each station transmits near real-time data in 15-minute intervals to the respective line agencies in each MC and also to the MRCS. The network includes flood season data manually shared by China for two stations in the upper Mekong (i.e., Lancang River) as part of a data sharing agreement with the MRC that began in 2002.

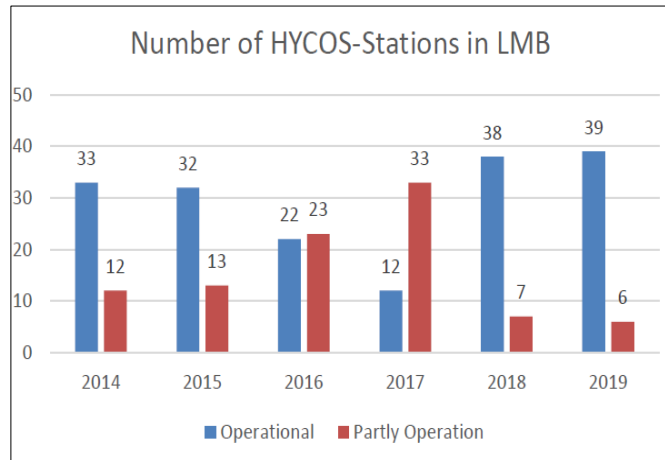


Figure 13: Annual operational status of the HYCOS stations in the Lower Mekong Basin from 2014- 2019

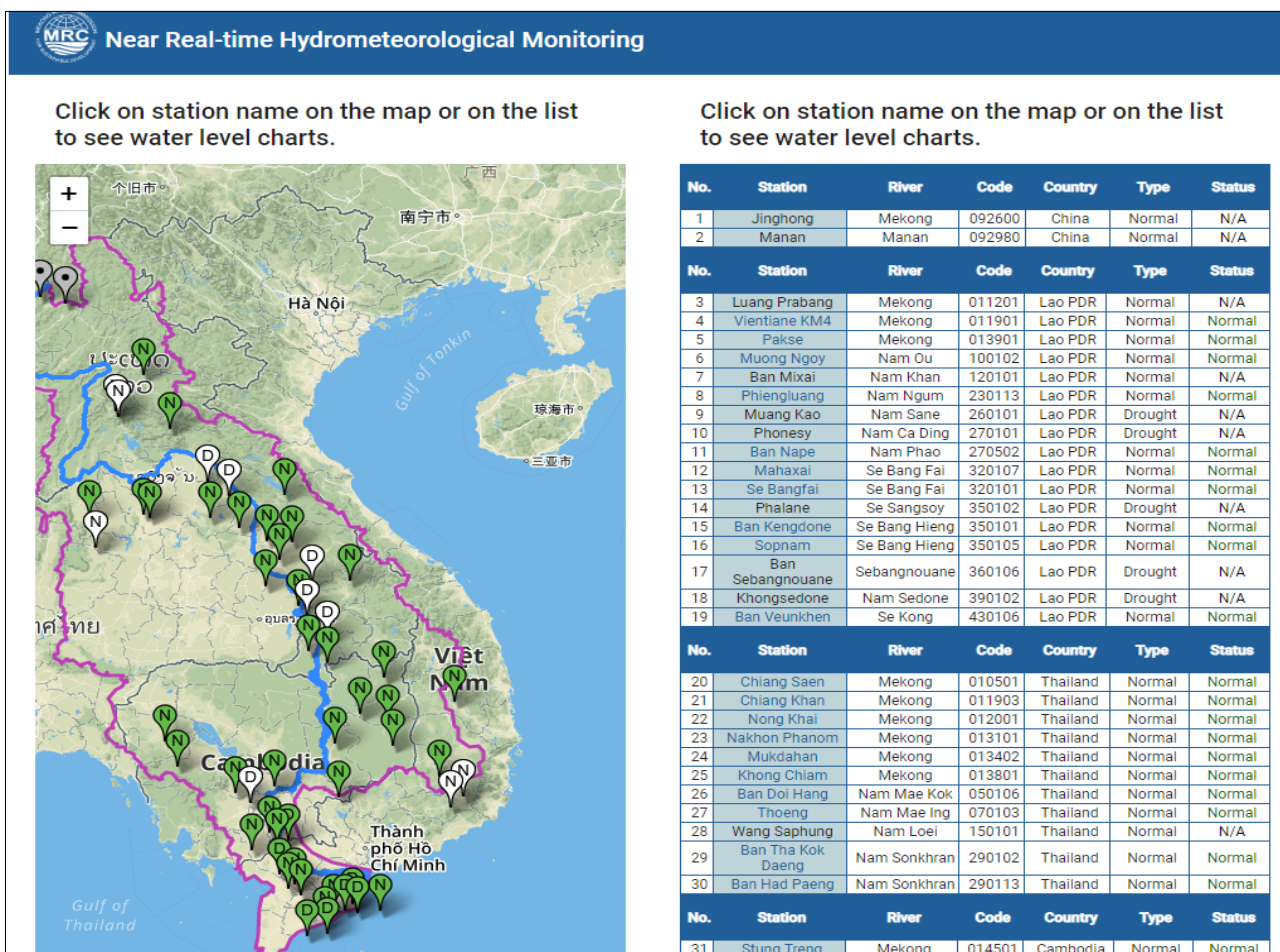


Figure 14: The MRC interactive web page showing near real-time hydrologic monitoring data in the Lower Mekong Basin

Recovery and field maintenance of the HYCOS stations

Year 2019 involved the continuation of MRC's concerted efforts that began in 2018 to address the O&M issues that plagued the proper functioning of the HYCOS stations in prior years, in particular during the period of 2014-2017, were continued in 2019. Several maintenance trips were completed in 2019 to address these issues, many of which were related to equipment malfunctions or lack of spare parts. These trips fixed many of the O&M issues in four HYCOS stations in Cambodia, two HYCOS stations in Thailand, and seven in Lao PDR. These efforts have resulted in maintaining a high level of up-time of the HYCOS stations since 2018 as depicted in Figure 14. The MRCS, NMCs, and relevant MC line agencies are continuously working together to address outstanding issues, including new issues that may arise as a result of emergency situations.

Expansion of the Mekong-HYCOS Hydromet Network

Year 2019 also saw significant progress towards expanding the Hydromet network to include additional stations. Five additional stations were identified: one station in Cambodia located at Preah Romkel; two in Lao PDR located at Xieng Kok and Ban Mai Singsamphan; and two in Thailand located at Bung Karn and Amnat Charoen. In addition, seven existing stations were identified for upgrading: Koh Kel in Cambodia; Thakhek, Paksan, and Savannakhet in Lao PDR; Nong Khai in Thailand; and Tra Vinh and Dai Ngai in Viet Nam. The civil works for the stations in Viet Nam were completed while the rest are scheduled for completion by mid-2020.

Improvements in the MRC monitoring and forecasting websites

The MRC maintains the following websites to communicate historical and near-real time data on rainfall and water levels, drought monitoring data, and flood and drought forecasting bulletins, reports, and other advisories to MCs, other stakeholders, and the public.

- Near real-time monitoring (HYCOS) website (<http://monitoring.mrcmekong.org/>)
- Flood forecasting website (<http://ffw.mrcmekong.org>)
- Drought forecasting and early warning website (<http://droughtforecast.mrcmekong.org/maps>)

The development of the MRC drought forecasting and early warning website began in 2015 in collaboration with the USAID SERVIR Mekong team led by ADPC. The website was finally integrated with the MRC website in December 2019. Year 2019 was devoted to the O&M of the near real-time monitoring and flood forecasting websites following concerted efforts enhancing them in 2018.

Spurred in part by the MRC systems reinvigoration initiative, MRCS initiated work on major improvements to the current MRC IS data portal. Scheduled for release in March 2020, the improved portal offers a more seamless integration of the websites highlighted above and the PMFM website.

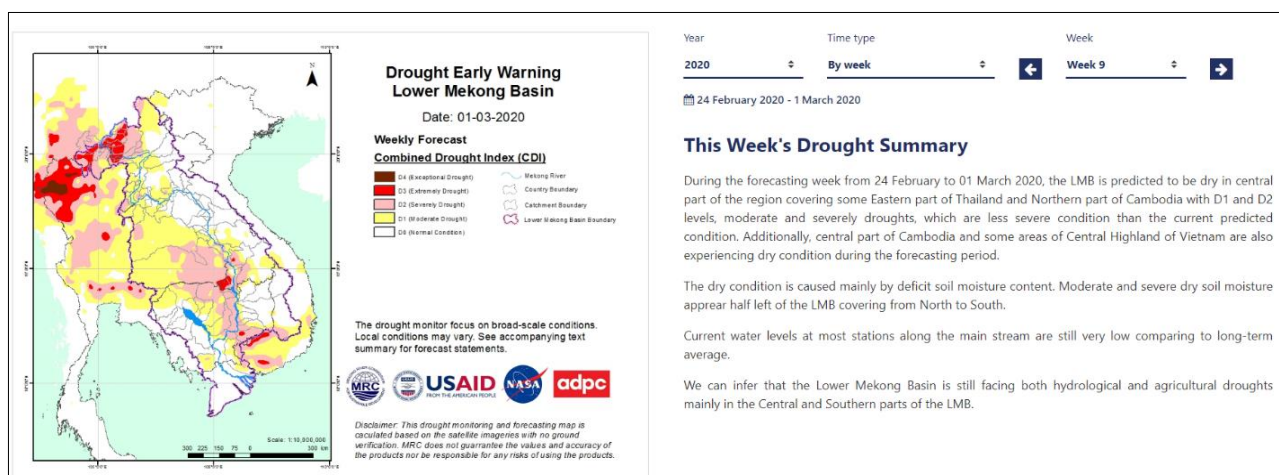


Figure 15: The MRC interactive web page showing weekly drought conditions in the Lower Mekong Basin

Daily / Weekly Flood Bulletins and Seasonal / Annual Reports

RFDMC successfully performed its routine river monitoring and forecasting services resulting in the completion and dissemination of 153 daily flood forecasting bulletins during the flood season (June – October 2019); 32 weekly river monitoring bulletins during the dry season (January – May 2019, and November – December 2019); 230 daily flash flood bulletins; 20 weekly flood situation reports; sub-daily weather station email notices for flash flood guidance to NLAs; and the integrated annual hydrology, flood and drought report. In addition to these routine services is the critical task of continuously enhancing, operating, and maintaining the database and modelling systems that underpin these services, and identifying other forecasting products that can be generated by these systems. Examples of RFDMC efforts in 2019 along these lines include:

- Initiating discussions on new forecasting products, such as long-term (1-, 3-, 6-month) flood forecasting bulletins, and national drought early warning system and bulletins
- Testing of bias correction methodology of satellite rainfall data using ground observation data from rainfall stations to improve river flood forecasting
- Information exchange to identify potential forecasting model improvements such as with the Thailand Hydro and Agro-Informatics Institute on flash flood guidance systems, and partners of ASEAN in November 2019 on river flood forecasting

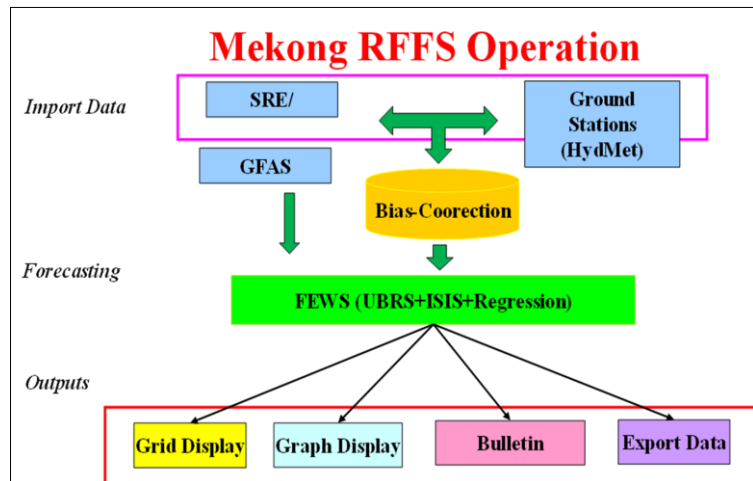


Figure 16: Conceptual architectural diagram of the Mekong River flood forecasting system

EVIDENCE OF CHANGE

The high level of performance of the Mekong-HYCOS Hydromet network, which began in 2018 due to the MRC's concerted O&M interventions, continued in 2019. This demonstrated an encouraging trajectory in the organisation's capability to sustain the reliable and timely delivery of its monitoring and forecasting services. In addition to improved capacity of the national routine monitoring teams, there is evidence of an increased maturity in the workflow processes followed by the MCs, NMCS, and MRCS to perform field maintenance visits and related O&M tasks. The new KPI that automatically measures the percentage of data transmitted by each HYCOS station is enabling MRC to detect and respond to potential station O&M issues early on. As repeatedly expressed by MCs, MRC's heightened interest in modernizing its information management and related systems has encouraged the MRCS Technical Support Division and RFDMC staff to proactively make incremental significant enhancements of the data portal, forecasting websites, and underlying models. These system enhancements, which began in earnest in 2018 and continued in 2019, have certainly contributed to the increased level of MRC's service with respect to its monitoring and forecasting CRBMFs.

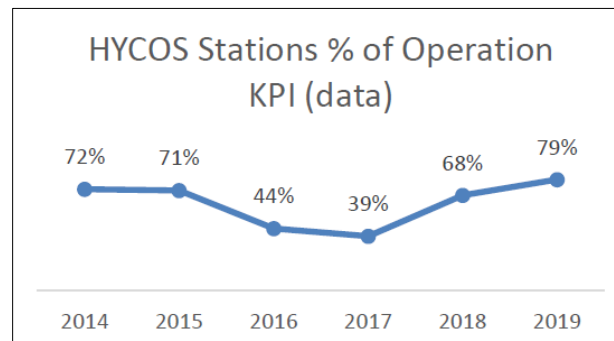
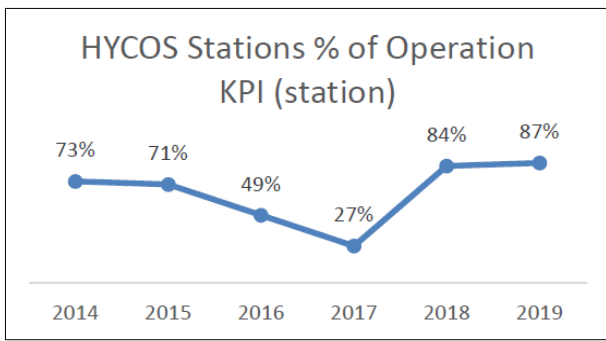


Figure 17: Annual average level of performance of the Mekong-Hycos Hydromet Network in the Lower Mekong Basin from 2014 – 2019 in terms of percent of stations in operation, and percent of data transmitted

The sustained interest in the flood forecasting website as reflected by the number of times the website is accessed can be considered as a surrogate indicator for the increasing awareness and knowledge of flood and drought conditions and forecasts of the national line and implementing agencies and the public at large. It is also an indicator of a corresponding increase in using such information to implement management measures, including early warnings to avoid, minimise, and mitigate both the short- and long-term negative impacts of these changing conditions. River communities are beginning to use hydrological monitoring data upstream of the river to determine potential for flooding or extremely low flow conditions that may impact agriculture and water use. The Thailand Department of Fisheries has been using social media to communicate upstream hydrological conditions to farming communities highly dependent on the river for irrigation and domestic use.

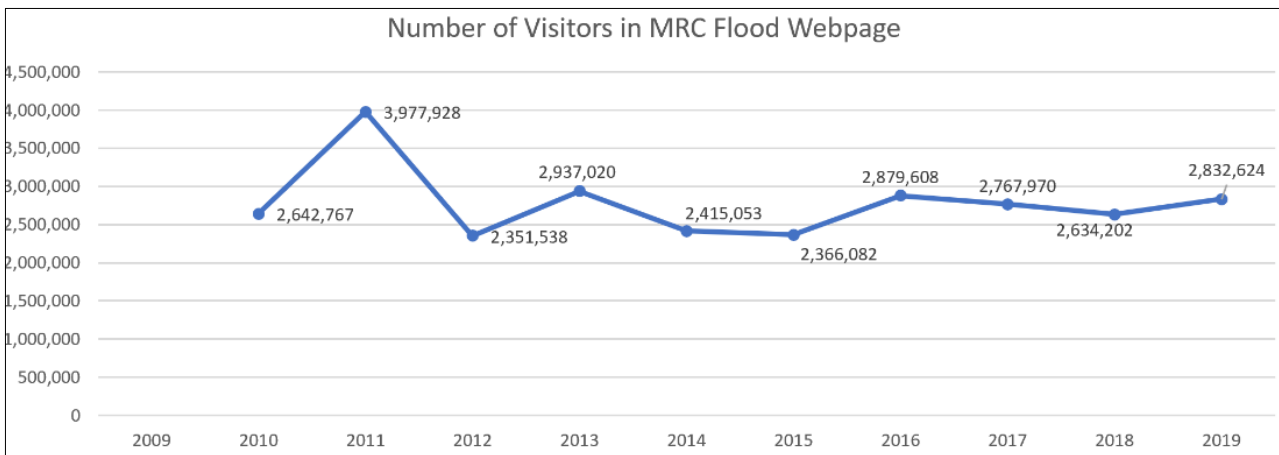


Figure 18: Annual number of visits to the MRC Flood Forecasting Web Page from 2009 – 2019

The overall improvement in the reliability and quality of MRC monitoring and forecasting services has also enabled the MRC to make efforts to disseminate abnormal hydrological conditions in the basin to be more informative and in a timely manner. The news reports that the MRC publishes through its website contain time-relevant and factual characterizations of the current conditions and science-based

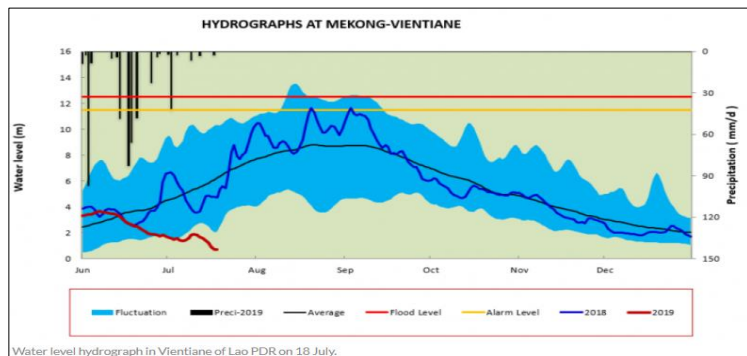


Figure 19: Historic low flow water level on 18 July 2019 as plotted against long term average water levels

predictions of near-term future conditions along the Mekong River. The graphs and maps that are now standard content elements of the news report further enhance the quality and effectiveness of reporting as they illustrate more clearly the magnitude and extent of flooding or drought conditions. Examples include the news report released on 18 July 2019 about the historic low water levels observed from June to July 2019; and on 5 September 2019 about the extreme flooding that occurred along the Mekong River brought by heavy rainfall from tropical storm PODUL on 31 August to 3 September 2019. The widespread flash flooding in Attapeu, Champasak, Savannakhet, Saravan, Khammouan and Sekong provinces in Lao PDR; in Quang Binh, Quang Tri, Thua Thien Hue, Gia Lai provinces in Viet Nam; and in Kiri province of Cambodia caused by PODUL were also accurately detected by MRC’s Flash Flood Guidance System.



Figure 20: Visualization of flood forecasts in the Lower Mekong Basin

Further evidence of mainstream use of MRC’s flood forecasting services is by the MCs themselves. On a routine basis, MRCS shares flood information via email to the national focal points of relevant national line agencies. In turn, these agencies disseminate information to a wider audience at national, sub-national and local levels.

Table 7: Key national line agencies for disseminating MRC flood information

Cambodia:	Department of Meteorology (DOM), Ministry of Water Resources and Meteorology
Lao PDR:	Department of Meteorology and Hydrology (DMH), Ministry of Natural Resources and Environment
Thailand:	Thai Meteorological Department (TMD), Ministry of Information and Communication Technology; and Department of Water Resources (DWR), Ministry of Natural Resources and Environment
Viet Nam:	Highland Regional Hydro-Meteorological Centre (HRHMC); and Southern Regional Hydro-Meteorological Centre (SRHMC), Hydro-Meteorological Service

Finally, the improved capacity of the Centre and MRC in general to maintain a high level of routine monitoring and forecasting services is resulting in renewed strategic efforts by the organisation that include pursuing collaboration with regional partners such as the SERVIR-Mekong and ASEAN, integrating the regional forecasting system with national systems, and updating the flood and drought management strategies. It should be noted that 2019 saw the completion of the Drought Management Strategy, its endorsement by the JC and approval of the Council.

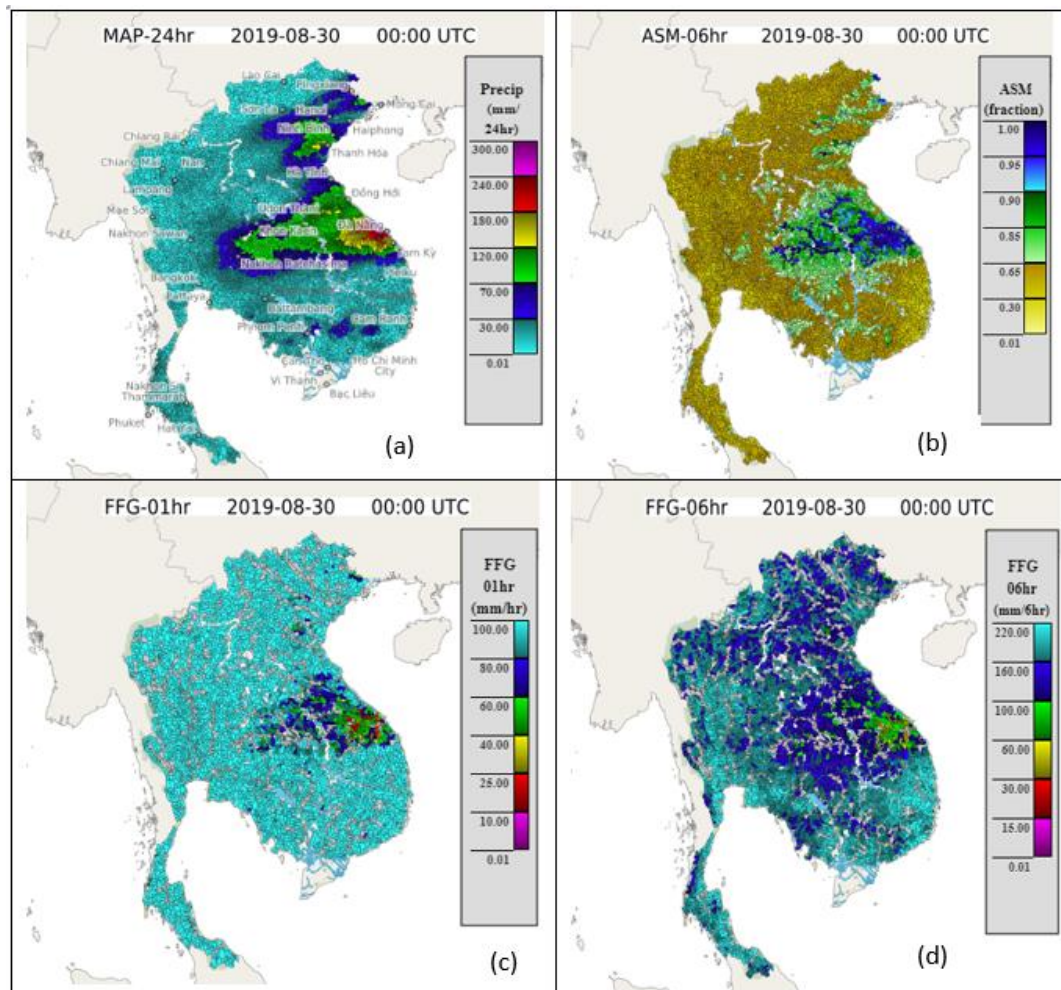


Figure 21: Hourly flash flood guidance in the Lower Mekong Basin for 30 August 2019

CONTRIBUTION TO SDGs

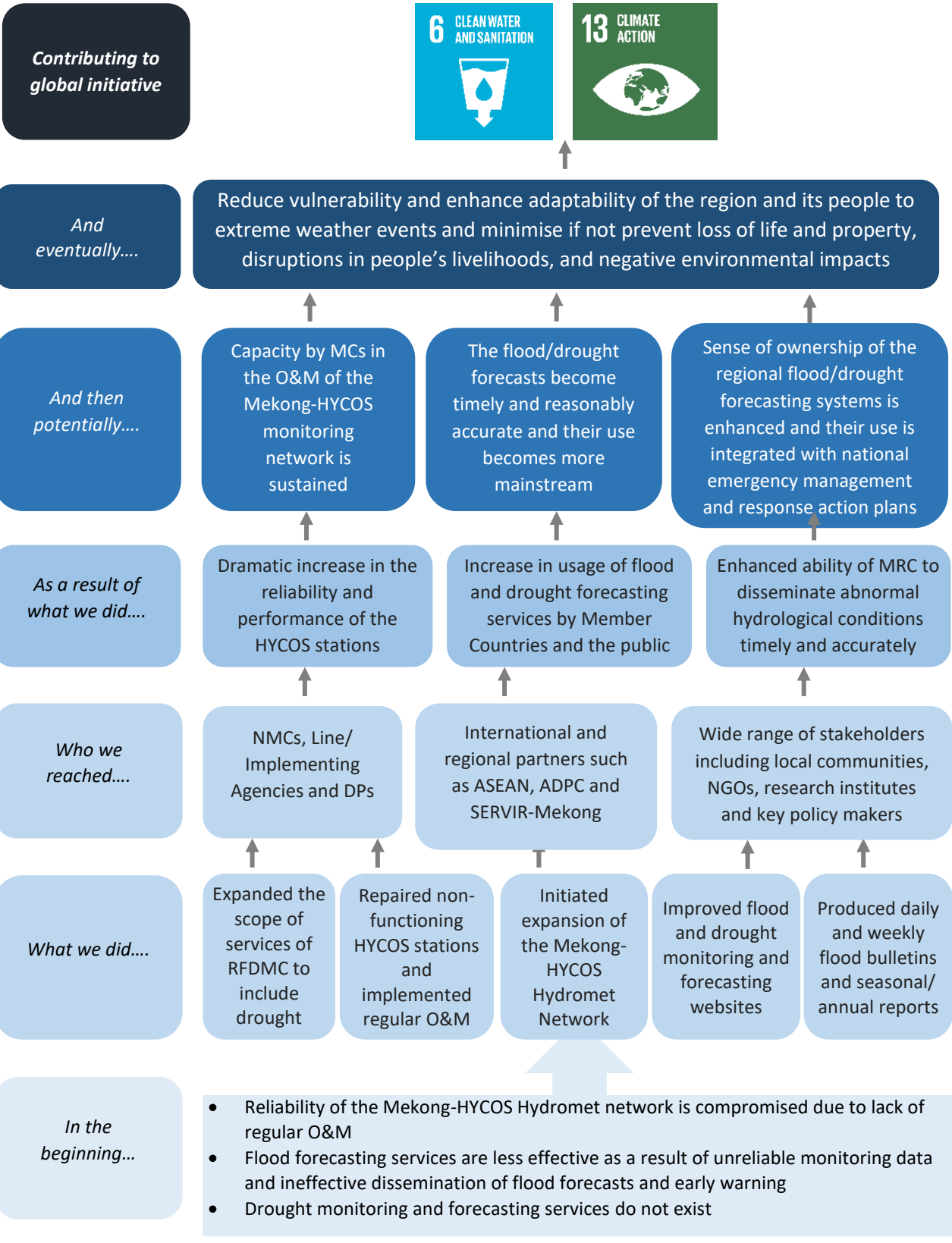
The increased capacity of the MRC to monitor its basins hydrologic conditions and provide timely and quality forecasting and early warning services contributes greatly to protecting the well-being and livelihoods of the people of the Mekong Basin and its economy. This supports the achievement of the following SDGs:

Goal 6: Water and Sanitation, specifically target 6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

Goal 13: Climate Action, specifically target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries; and target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

Pathway to Change

Monitoring, Forecasting and Dissemination of Basin Conditions in the context of Low Flows, Floods, and Droughts



OUTCOME 6

Towards Comprehensive Reinvigoration of MRC Data, Information, Modelling, Forecasting and Communication Systems

INDICATORS:

- The extent to which Line / Implementing Agencies use MRC reports and information systems for better decision-making

The Siem Reap Declaration by the Prime Ministers of the four governments of the MRC Member Countries at the MRC Summit in 2018 called for strengthening of the MRC basin-wide monitoring networks and forecasting systems, and the data and information management systems underpinning them. This declaration comes with the urgency and the increasing recognition of the critical importance of these systems in enabling the MRC to successfully deliver its mandate.

The MRC Secretariat as the custodian of Mekong Data and Information Systems according to the approved MRC Procedures for Data, Information Exchange and Sharing (PDIES), maintains a knowledge base that has accumulated over 60 years of data collection, analysis, assessment, and modelling by the Mekong countries. As the only treaty-based river basin organisation in the world, over the years the MRC has invested considerably on the development, operation and maintenance of its information systems and related assessment, modelling, and forecasting tools to provide Member Countries with the data, information, and knowledge needed to make evidence-based decisions.

2019 may ultimately prove to be the turning point when the organisation embarked on a deliberate path towards overhauling its information system to take advantage of modern advances in data, science, and technology, and more importantly, to enable the organisation to meet its current and foreseeable needs. The completion in 2019 of the strategic initiative to conduct an assessment of its current systems and to prepare a Design Concept for their reinvigoration is a significant first step.

PROGRESS

Subsequent to the 2018 Siem Reap Declaration, several events have occurred that further highlighted the importance and urgency of modernizing MRC's current information systems and related assessment, modelling and forecasting tools. For example, the 2018 MTR key recommendations include: i) prioritising the upgrade of the MRC information system in the next two years; ii) committing to upgrade regional flood forecasting capability; and iii) making a decision on the future modelling platform for the Decision Support Framework as part of upgrading modelling capability. In early 2019, the need to strengthen the MRC's capacity for river monitoring, forecasting and timely communications was repeatedly expressed during the separate high level meetings by the MRCS CEO with the Cambodian, Lao and Vietnamese Ministers of Water, Natural Resources and Environment and the Secretary-General of the Thai National Office for Water Resources at the Prime Minister's Office. This has been encouraged with the appearance of strong multi-partner support and cooperation.

With financial support of the Australian Department of Foreign Affairs and Trade secured, the MRCS has engaged an Australian team (eWater, Murray–Darling Basin Authority, Bureau of Meteorology and Geoscience Australia) to work closely with its Core Team at the MRCS to review the current MRC systems and related tools and to prepare a high-level design concept for a reinvigorated and integrated system covering the following areas, among others:

- **Data quality control and assurance process** to be revisited and upgraded to international standards and best practices to ensure high quality analysis-ready data for immediate use.
- **Integrated database and data management system** which would be facilitated by a modern ICT system/platform to efficiently deliver time-series, spatial and sectoral information such as hydropower or irrigation.
- **Document management system** to maintain knowledge and institutional memory and ensure good management and balanced development of the rivers and in the basin.
- **Modelling tools** of the MRC to be expanded and enhanced through a modern flexible platform approach. Ability to respect and ensure backward compatibility to SWAT/ISIS/IQQM where appropriate and incorporate the DSF Toolbox but provide an adaptable framework so that new tools can be incorporated as science advances, such as in socio-economic and environmental assessments.
- **River monitoring and forecasting** to be modernized through an integrated system of web-based reporting and notification, which includes river flood, flash flood and drought monitoring/forecasting.
- **State of Basin Report** and **MRC Indicator Framework** to be presented in a simple dashboard and web-based reporting system as data/content are periodically updated.

After several national consultations in September and October 2019 and a meeting of the Expert Group on Data, Modelling and Forecasting (EGDMF) in November 2019, the team completed the Design Concept for reinvigorating MRC's Data, Information, Modelling, Forecasting and Communications Systems.



Picture: Participants during the 5th Meeting of the Expert Group on Data, Modelling and Forecasting (EGDMF) in Phnom Penh on 21 November 2019 to discuss the draft Design Concept for Reinvigorated MRC's Data, Information, Modelling, Forecasting and Communication Systems

Design Concept

The design concept for the reinvigorated system is composed of these architectural elements as depicted in the system architecture diagram (see inset) and as listed below:

- **Integrated databases and documents** are the core element of the enhanced MRC system, consisting of four databases (time-series, spatial, sectoral and document) linking to the four elements: modelling and assessment, monitoring and forecasting, integrated procedure implementation, and the communication and reporting platform. The data portal and digital library are the gateways providing a means for searching and retrieving content contained in the digital collection in the MRC archive. A collaborative space facilitates file storage and sharing amongst the MRCS and MCs.
- **Modelling and assessment** are enhanced by fully integrating eWater Source modelling platform to the existing MRC Decision Support Framework and Toolbox, adding web-based functionality for reporting and dissemination to the knowledge base and enriching impact analysis tools with environmental and socio-economic assessment, procedure compliance and indicator framework.
- **Monitoring and forecasting** are reconceptualised with an integrated data-information-forecasting modern visualisation tool for monitoring and forecasting, more efficient workflows, ownership of the systems, additional flood and drought products and services, and synergised communication products.
- **Communications and reporting platform** help build stronger communications with the community and drive a positive conversation between the general public and the MRC. It consists of the MRC website, MRC apps and social media supported by various webpages of the data portal, digital library, modelling and assessment, monitoring and forecasting and integrated procedure implementation. It includes the **Integrated procedure implementation**, which is communicated via a web-based interactive platform that shows the PDIES Data Portal, interactive maps of water uses of the PWUM, interactive maps of projects submitted under the PNPCA, near real-time flow monitoring against flow frameworks of the PMFM, and water quality scores of the PWQ.

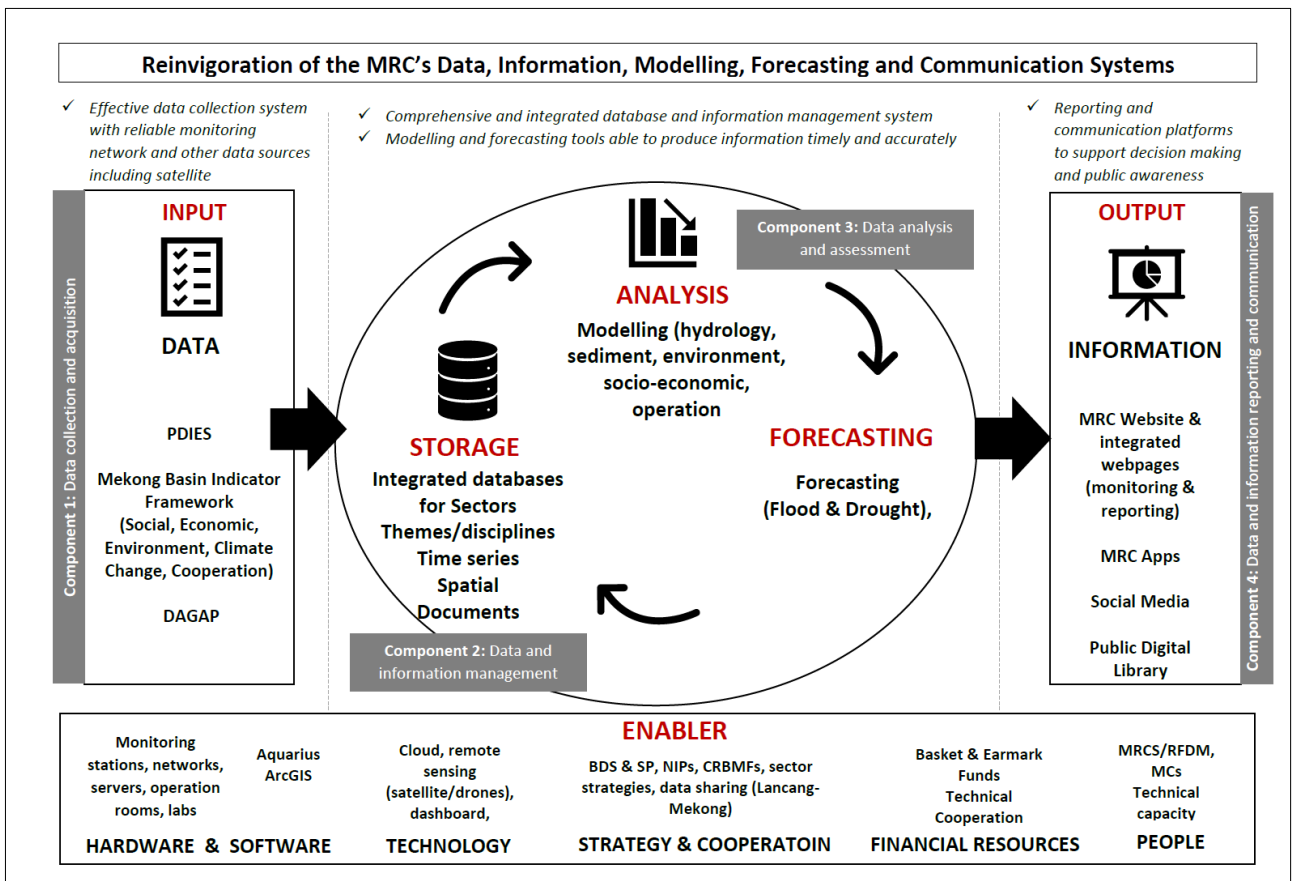


Figure 22: Architecture of main elements of the reinvigorated MRC data, information, modelling, forecasting and communication systems

These architectural elements are grouped into four components: (1) data and information collection and acquisition; (2) data and information management; (3) data and information use and manipulation; and (4) data and information presentation. As depicted below, these four functional components are aligned with the MRC CRBMFs of data acquisition, exchange and monitoring; analysis, modelling and assessment; planning support; forecasting, warning and emergency response; and implementing MRC Procedures.

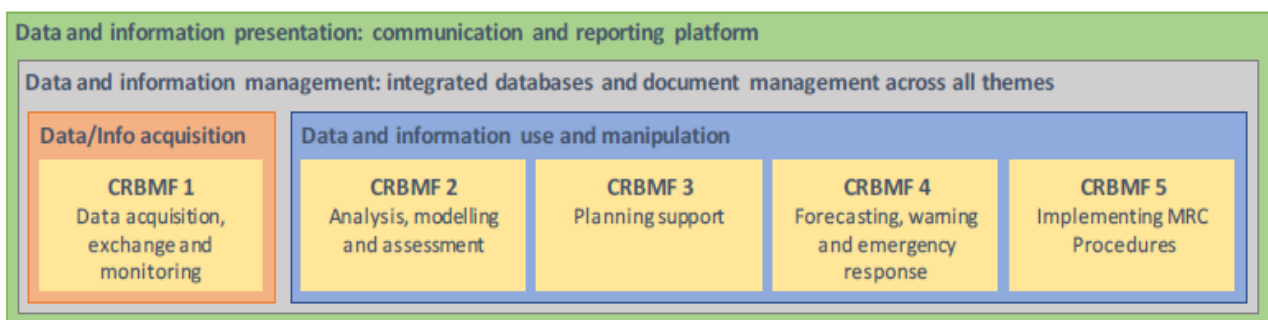


Figure 23: Functional components of the MRC's reinvigorated systems

Short- and Long-term recommendations

The Design Concept provides a range of short- and long-term recommendations towards full-scale implementation of the design concept. Recognizing that the long-term recommendations will take several years to implement, short-term recommendations were also provided to address the immediate needs of the MRCS, including migrating the current systems to the new tools/systems/platforms. The Design Concept also lists management recommendations including, for example: incorporation of implementation activities

of the Design Concept in the next BDS, fund raising, stakeholder outreach and consultation, and capacity building.

EVIDENCE OF CHANGE

The Design Concept was endorsed by the JC on 25 November 2019. The full-scale implementation of the Design Concept is anticipated to bring several enabling and transformative changes to the MRC which increase the likelihood of success for the organisation to deliver its CRBMFs. These changes and corresponding benefits, which will dramatically increase as the Design Concept is implemented, include the following:

- Increased awareness among MRC leadership and MRCS staff of the expanding role of IS and modelling, which historically focused in supporting planning functions, to support more real-time monitoring, impact analysis, forecasting and river basin management in response to the rapidly changing basin.
- Sustained use of the data portal. The data portal, which is the public-facing interface of the MRC IS currently being used not only by the MCs but also by a wide range of stakeholders including research and educational institutions, non-government organisations, the private sector and the public. While its use (i.e., based on the number of visits by users) has been steadily increasing, the rate of data downloads has flattened in recent years. It is recognized that the portal's usage will increase significantly as more data are made available and easily accessible through the system reinvigoration which calls for its quick fix by enhancing data search, data visualization, and data request. This is expected to greatly benefit the MCs' line and implementing agencies that have relied heavily on data available in the MRC IS.

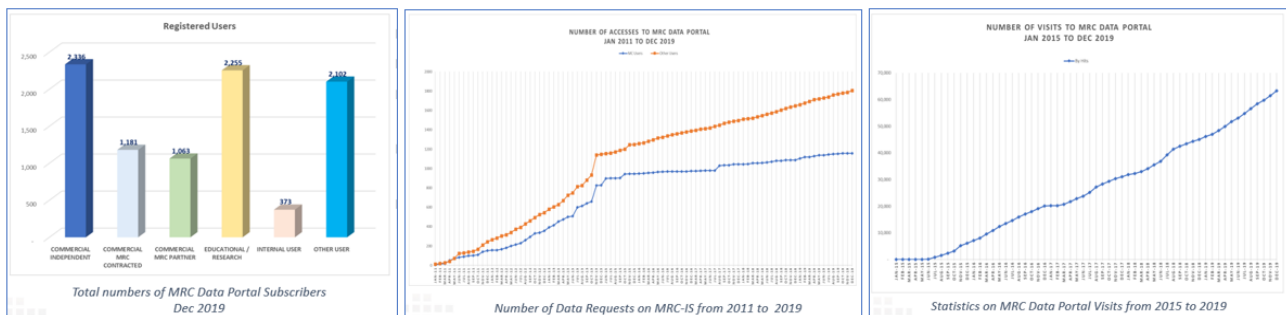


Figure 24: Level of use of the MRC Data Portal

- There is encouraging evidence that MCs are beginning to integrate MRC IS with their NIS. For example, Thailand has adopted a similar look-and-feel interface to the MRC IS data portal for its TNMC IS website. In addition, the TNMC IS directly and seamlessly navigates to the relevant MRC IS data portal web pages to visualize monitoring data (e.g., HYCOS stations) that are already available at the data portal. It is conceivable that MCs like Lao PDR and Cambodia could adopt the data portal's user interface and functional features to jump-start the design and development of their own water NIS.



Figure 25: Comparison of the web interface of the MRC IS Data Portal and TNMC IS website showing some level of consistency and compatibility

- Continuous willingness of Dialogue Partners to share data through the MRC IS data portal. For example, China has been providing flood season data from two hydrometeorological monitoring stations in the Lancang River (e.g., Jinhong and Manan stations) for publication in the MRC IS data portal. In fact, this data sharing agreement between China and the MRC was recently renewed in July 2019.
- Increase in proactivity and resourcefulness of the MRCS to make major enhancements of the current data portal that basically addresses to some extent the short-term recommendations of the Design Concept, such as implementing changes in the system architecture to make the site more user-friendly and intuitive; enhancing data search and download functionalities by improving metadata structure and filtering algorithms; and integration of new tools such as the AQUARIUS time-series to improve data QC and visualization. The improved data portal is planned for release in early 2020.



Figure 26: Visualization of time series data for QC using new tools such as AQUARIUS.

CONTRIBUTION TO SDGs

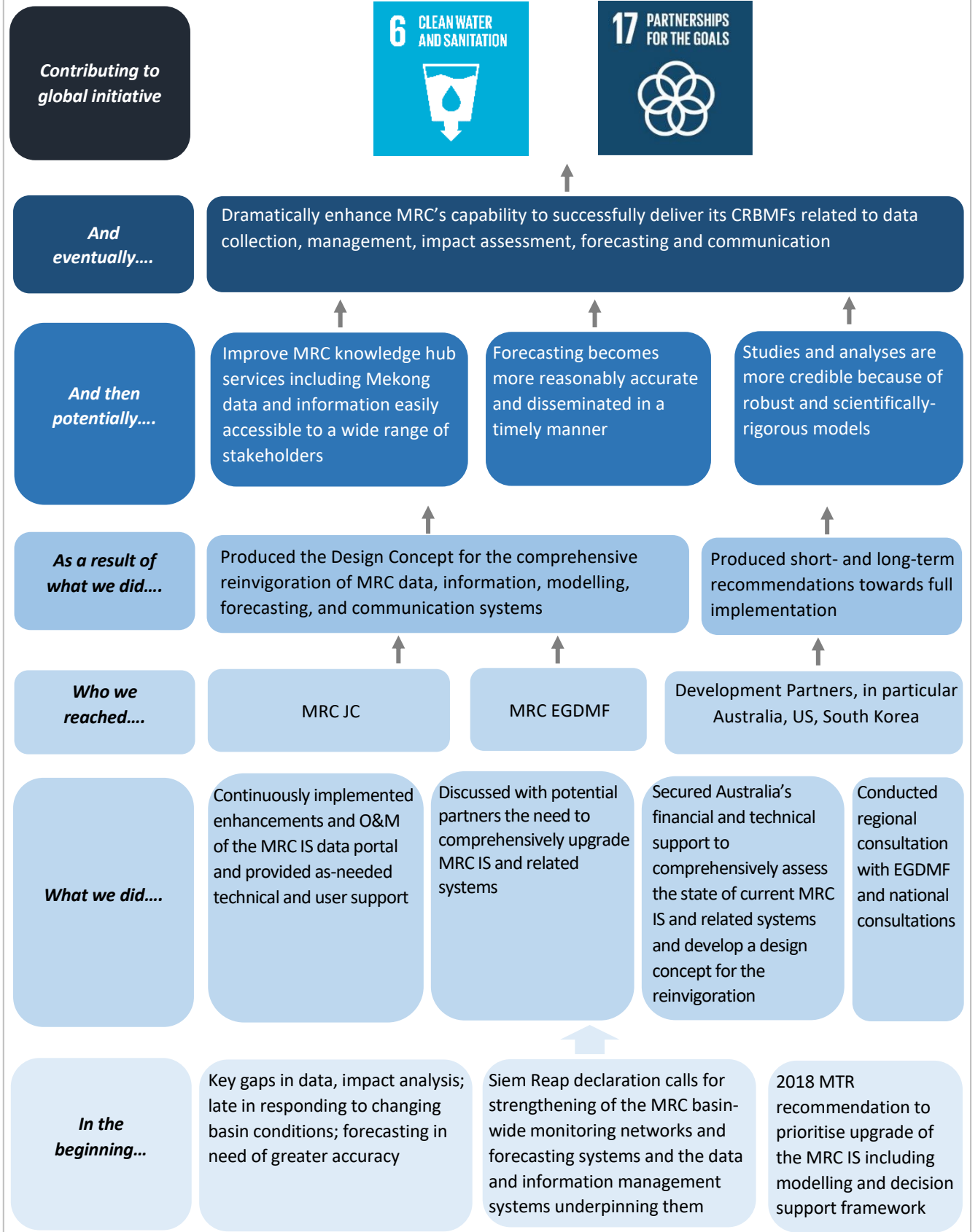
As per the outcome indicator, the reinvigoration of the MRC information system and related tools will enable the MRC and MCs to have access to the latest data and information to support informed and timely decision-making. Therefore, this will contribute to the achievement of the following UN SDG:

Goal 17: Partnership for the Goals, specifically target 17.9: Enhance international support for implementing effective and targeted capacity building in developing countries to support national plans to implement all the Sustainable Development Goals, including through North-South, South-South and triangular cooperation; target 17.16: Enhance the global partnership for sustainable development, complemented by multi-

stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries; and finally 17.18: By 2020, enhance capacity building support to developing countries, including for least developed countries and small island developing States, 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

Pathway to Change

Towards Comprehensive Reinvigoration of MRC Data, Information, Modelling, Forecasting and Communication Systems



OUTCOME 7

Strengthening Internal Controls in Support of a Transparent, Accountable, and High Performing Organisation

INDICATOR:

- Percentage of MRC SP outputs completed as planned

At the First MRC Summit in 2010, the political leaders of the four MCs committed to an ambitious MRC organisational reform and development vision, including the goal of financial self-sustainability by 2030. Since then, remarkable progress has been made in increasing financial contributions from the MCs, restructuring the organisation, and updating various procedures and manuals to make the organisation more transparent, efficient and effective.

Several independent reviews were also conducted in support of organisational strengthening, including the EU Pillar Assessment, the Organisational Review 2018 commissioned by development partners and facilitated by GIZ, and the Mid Term Review of the MRC SP in 2018-2019 facilitated by the MRCS.

The EU Pillar Assessment conducted in 2017 saw MRC passing all aspects of financial management except internal controls. The Operational Review assessed the new and reformed MRC, its organisational structure, staff resource capabilities, planning and workflow processes, and internal controls and systems at multiple levels: at the strategic and policy level with respect to implementing its mandate; at the organisational level with respect to its ability to deliver its products and services; and at the operational level, which includes internal controls and management systems for administration, finance, procurement, human resources, and information. The MTR mostly referred to the OR in terms of internal organisational strengthening needed.

The year 2019 represents a continuation of this transition with several key milestones achieved which addressed many of the recommendations. The reviews recommended several immediate reforms to address deficiencies and improve internal controls including that of the financial and accounting systems. The actions that MRCS have taken in 2019 to strengthen the financial and accounting systems, including among many others the establishment of the Audit Committee, the employment of an independent Internal Auditor, and the revision of operation manuals (i.e., Administration, Finance, Procurement and HR, and Fraud Prevention and Anti-Corruption Guidelines*), have culminated in the MRCS passing the EU Pillar Re-Assessment in November 2019, which provided reasonable assurance to the European Commission and other development partners as well as member countries that the MRC fulfils applicable requirements with regards to the pillars: internal controls, accounting, external auditing, and procurement.

** Fraud Prevention and Anti-Corruption Guidelines (FPAC): The revision of FPAC has not been completed yet. It, along with the Rules of Procedures for the Council, JC, and MRCS, is being reviewed and planned to be finalized by the end of 2020.*

PROGRESS

Significant milestones were completed in 2019 with respect to strengthening MRC internal controls including the following:

1. The establishment and functioning of an independent Audit Committee as part of the governance structure of the MRC and which reports directly to the JC to enable them to provide the necessary direct oversight of financial performance and to monitor compliance with applicable institutional policies, legal, ethical, and regulatory requirements. The Internal Auditor, which reports to the AC, also shares annual reports and key actions taken with the Budget Committee.

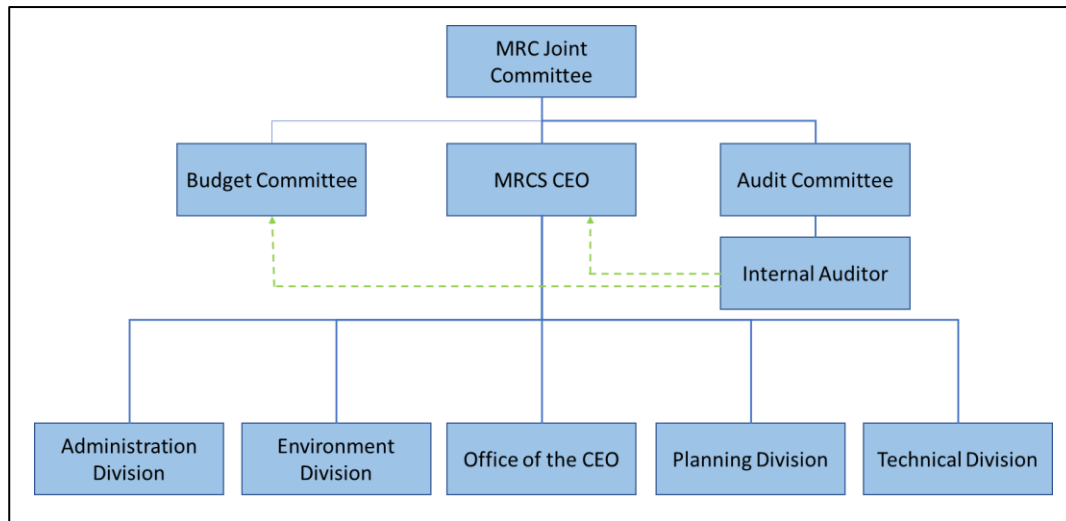


Figure 27: MRC high-level organisational structure showing Budget Committee and Audit Committee reporting and communication lines

2. Consistent with international standards such as the International Public Sector Accounting Standards (IPSAS) and as proposed by the Audit Committee, the adoption of a three-year mandatory rotation policy for the reselection of external auditors.
3. Revision of Internal Audit manual (version 1.0) and its subsequent approval by the Audit Committee. The manual outlines the authority and scope of the internal audit function, documents standards, and provides cohesive guidelines and procedures. These guidelines promote consistency, stability, continuity, acceptable performance standards, and a means of effectively coordinating the efforts of audit staff.
4. Finance manual (version November 2019) was updated along with HR, Administration, and Procurement manuals. The revised Finance manual, which was agreed by the Budget Committee and then approved by the MRC JC on 25 November 2019, incorporates relevant international best practices and step-by-step guidelines for MRCS staff and those at the NMCS around financial procedures, reporting, auditing, and accountability requirements by the MRC, MCs and DPs. It specifically includes the following significant updates:
 - Full incorporation and update of Basket Fund guidelines
 - Detailed financial procedures compatible with the new organisational structure. This includes multi-year budgeting that is reviewed every year to incorporate detailed budgets to reflect the current work plan
 - Inclusion of a new chapter on financial controls which sets out clear policies to better control and manage MRC financial resources in order to mitigate financial risks
 - Inclusion of a new chapter on internal auditing, including roles and responsibilities of the internal auditor

5. MRC recognizes the need to improve the current ERP system to be cost-effective and fit-for-purpose for a self-financing MRC in 2030. The improved ERP software that takes advantage of modern technologies and provides adequate monitoring and reporting dashboards, including the ability for activity/task managers to receive regular status updates on budget vs. actual project expenditures, is crucial to further strengthening internal controls and improving financial performance.

EVIDENCE OF CHANGE

The year 2019 represents the achievement of several key milestones for financial and accounting reforms as part of strengthening the MRC's internal operation and as it continues to transition to a leaner and more efficient organisation towards becoming financially self-sustainable by 2030. The passing of the Pillar Reassessment in November 2019 is a significant milestone. In addition to increasing the development partners' confidence, the sustained commitment and confidence of MCs is clearly evidenced by the fact that their contributions are now being remitted in full and on-time, including MCs agreeing on a specific calendar due date for their annual contributions. This commitment is without doubt helping reduce uncertainty, improve MRCS staff morale, enhance the organisation's standing with development partners and the broader community, and enable the organisation to perform its functions according to plan.

The progress made in strengthening the internal operations, including updating the manuals, have provided the specificity and clarity that MRCS staff need to enable them to perform their tasks more deliberately according to "rules" thereby improving the individual and collective efficiency of the workplace. This change in behaviour in individual staff, including becoming more deliberate and careful, has led to numerous instances of encouraging results. For example, the significant reduction in the average number of turnaround days for staff to settle their travel advance, and faster processing of cash advance payments. There is also a growing recognition of adopting international standards, including leaning towards requiring finance staff to be trained and certified in IPSAS as the organisation moves from cash to an accrual accounting basis.

As these instances of positive results are anticipated to increase substantially and become more ingrained in the culture of the organisation than isolated and random cases, it may be valuable for the organisation to track these benefits not only to be able to quantify the return on investment of strengthening internal controls but also to serve as input to continuously improve.

With the Basket Fund arrangement, MRC's leadership has the mechanism not only to ensure balanced implementation of MRC priorities but also to increase its flexibility in addressing emerging needs in a timely manner. In addition, the Basket Fund arrangement inherently improves transparency and efficiency in the overall financial management of MRCS since one overall budget is being managed rather than numerous programme budgets. It also provides a mechanism for easing the transition from a primarily donor-funded to an MC-funded organisation.

While the passing of the EU Pillar Assessment paved the way for MRC's existing development partners to meet their own requirements and eliminate any major stumbling blocks for them to deliver on their financial pledges to the MRC, this important milestone is also expected to attract and make it easier for other potential development partners to come forward and support the MRC in achieving its mission for a sustainable Mekong.

CONTRIBUTION TO SDGs

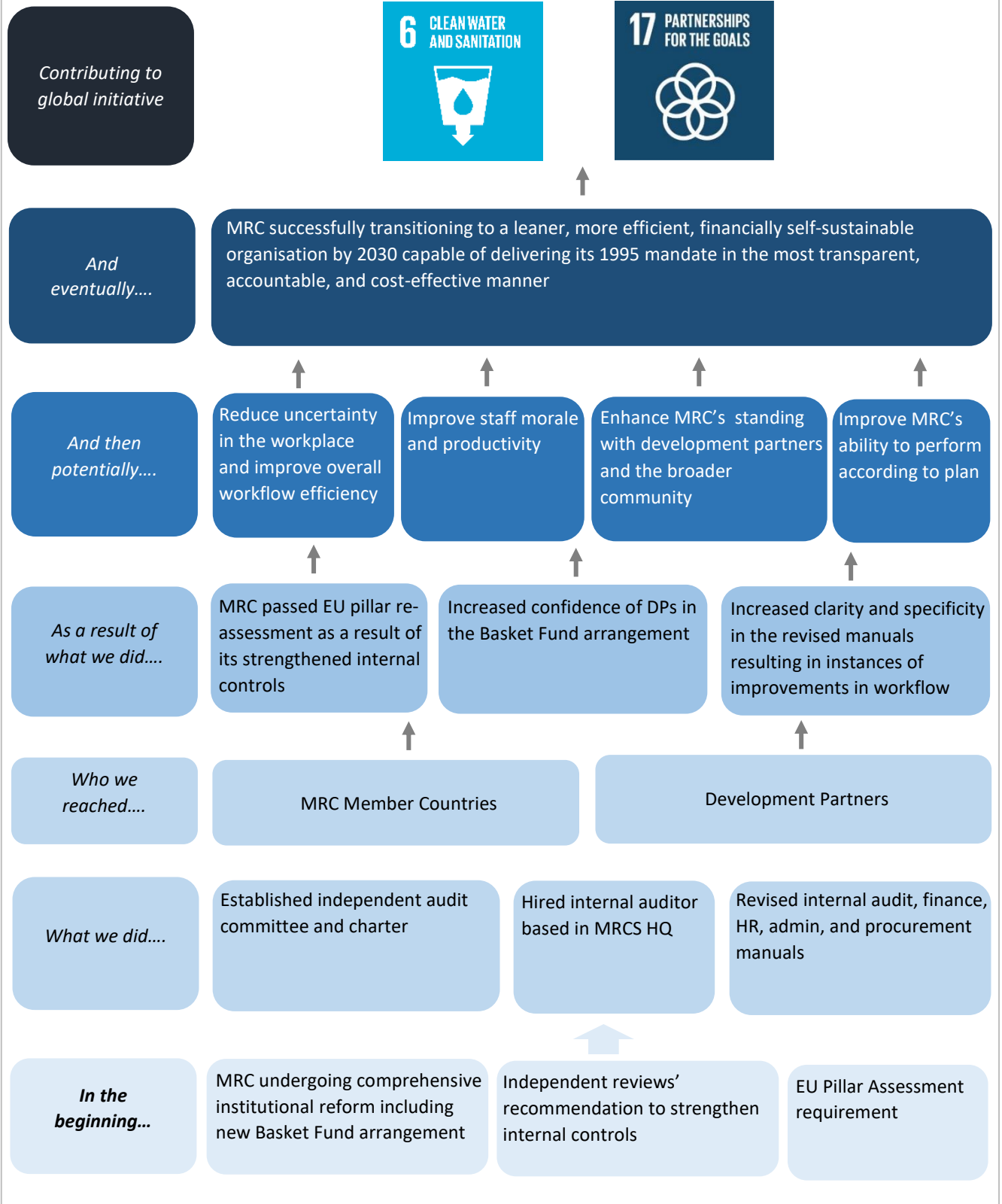
The MRC's commitment for the continuous improvement and strengthening of its internal operations including its financial and accounting systems enhances the organisation's wherewithal to implement its mandate and deliver the outputs and services according to its strategic plans. After all, organisations tend to flourish after establishing adequate internal controls as they lead to the efficient execution of operations to deliver value to their stakeholders and achieve their strategic objectives while aligning with industry best practices, laws, and regulations to manage risks. Therefore, a river basin organisation like MRC that has strengthened its capability to deliver its mandate will contribute to the achievement of the following UN SDGs:

Goal 6: Water and Sanitation, specifically target 6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

Goal 17: Partnerships for the Goals specifically target 17.9: Enhance international support for implementing effective and targeted capacity building in developing countries to support national plans to implement all the Sustainable Development Goals, including through North-South, South-South and triangular cooperation.

Pathway to Change

Strengthening Internal Controls in support of a Transparent, Accountable, and High Performing Organisation



OUTCOME 7

Dashboards Developed in support of Organisational Performance and River Basin Monitoring

INDICATOR:

- Percentage of MRC SP outputs completed as planned

Dashboards have been widely used for years especially in the private sector to monitor and evaluate performance. They are considered as effective tools and there is plenty of evidence of a high correlation between the use of dashboards and productivity. They have also proven to be useful for diagnosing performance issues in near real-time, which allows organisations to implement intervention measures early in the process. For government agencies, dashboards are also used to improve transparency as they can be made readily accessible to the public when deployed over the Internet.

The MRC has employed a dashboard since 2016 for financial management and for monitoring and evaluation (M&E). The financial dashboard is being used regularly in senior management meetings at the Secretariat to report financial performance and recommend management actions. The MTR has in fact recognized the use of a dashboard for monitoring and evaluation as a noteworthy advance by the MRC to make the progress on outputs, tasks and activities readily available to MRC staff. Moving forward, the MTR noted that dashboards as a feature of an M&E system can be used to highlight areas of concern during regular Division and inter-Division meetings to improve feedback to Management. In response, the M&E dashboard has been formally established as the tool for MRC staff to report the implementation status of the strategic plan.

With the positive experience of the MRCS in using dashboards for financial management and M&E, in 2019 the organisation embarked on expanding the application of the dashboard concept and other visualization tools to improve the monitoring of conditions and trends in the basin as well as monitoring at national levels. This initiative is also in line with MRC's design concept for reinvigorating its data, information, modelling, forecasting and communication systems, which highlighted dashboards and visualization as important functional features of the reinvigorated system.

PROGRESS

Year 2019 saw the increase in the usage of dashboards and visualization tools to enhance the development, implementation and completion of key MRC initiatives and activities. This increasing trend in use is also in conjunction with the implementation of activities that aim to improve the capacity of MRCS and NMCS staff in developing and using dashboards and to enhance the current information and communication infrastructure. These key accomplishments include the following:

- Completion of the system reinvigoration initiative (see related story), which produced a Design Concept that reinforces the need and importance of dashboard and visualization (Component 4) for effective data and information management, modelling, forecasting, and communication. The Design Concept was endorsed by the JC on 25 November 2019.
- In parallel with the system reinvigoration initiative were the continuing internal efforts to enhance the MRC IS data portal in particular, related to the presentation and visualization of monitoring data and forecasting information. The MRC uses commercial off-the-shelf software such as AQUATIC Informatics, AQUARIUS and open-source libraries like Plotly and AmCharts for time-series visualization to support data quality control and interactive display of the MRC's hydrometeorological data (e.g., Mekong-HYCOS Hydromet network) and flood forecasts. Moreover, the Expert Group on Data, Modelling and Forecasting (EGDMF) agreed to develop an integrated dashboard for all MRC core river monitoring and forecasting activities during its meeting in November 2019.

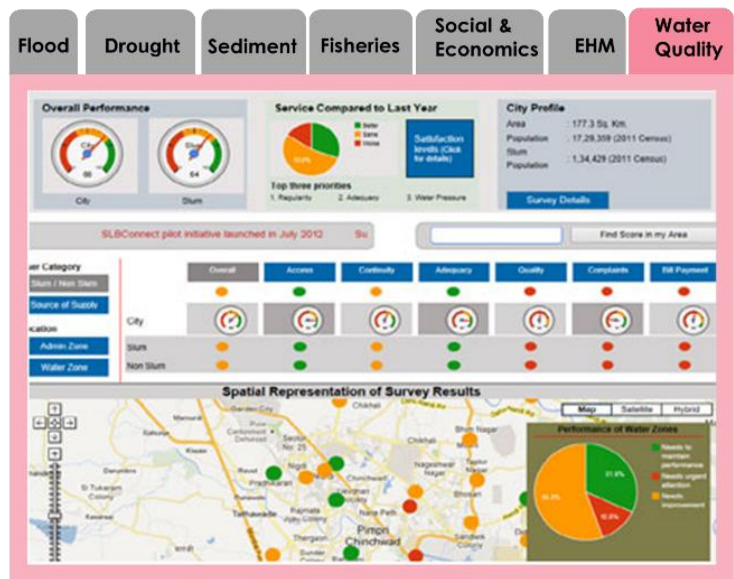


Figure 28: Integrated dashboard concept for MRC core river monitoring activities

- Completion and deployment on the MRC website in September 2019 of the online interactive tool for the Council Study, a study on the sustainable management and development of the Mekong River Basin including impacts of mainstream hydropower projects. This tool represents the first interactive version of a major MRC report and allows users, including broader stakeholders and the public, to easily navigate through the main findings, conclusions, and recommendations of the study and how they are supported in detail by the underlying assessments and data.



Figure 29: Web-based interactive tool for the Council Study

- Prior to completion of the Council Study interactive tool, the MCs participated in four national workshops conducted with technical support from the U.S. Army Corps of Engineers on Shared Vision Planning (SVP) in May 2019. SVP represents an approach and offers set of tools, techniques, and case studies, facilitates a common understanding of the natural resource system and provides a consensus-based forum for stakeholders to identify trade-offs and management options. The potential application of SVP was demonstrated during these national workshops through its use for mapping and visualizing the Council Study findings. An online dashboard version is planned for development in 2020, which would improve capacity building, dialogue and discussion among stakeholders.
- Completion of an M&E dashboard training workshop in Bangkok, Thailand on 11-12 December 2019. The training was attended by technical staff from the NMCS who learned how MS Excel advanced functions and Power BI can be used for data visualization. The participants produced and presented dashboards for some key monitoring needs, including water level and discharge monitoring data in Cambodia, Nam Ngum reservoir operation in Lao, salinity intrusion in Viet Nam, reservoir storage volumes in Thailand, and enhanced financial performance monitoring for the MRCS. This training was a follow-up to the regional workshop held in Vientiane, Lao PDR in August 2018 on NIP dashboard and M&E reporting systems.



Picture: The M&E dashboard training workshop was conducted by Mr. Santi Baran, the MRCS in-house riparian specialist on monitoring, evaluation and dashboard development.

EVIDENCE OF CHANGE

Increasing recognition of the importance of dashboards and visualization tools, and how they can be applied to enhance MRC core services is evident in the number of initiatives and activities that were conducted in 2019. This flurry of initiatives and activities was encouraged by a combination of factors including, the MTR recommendations, the benefits demonstrated by using dashboards for financial management, and the increase in the commitment of the organisation to strengthen its internal operations and its systems for M&E, information management, modelling, forecasting, and communication. The several meetings and workshops conducted by MRCS and partner organisations under the system reinvigoration, Shared Vision Planning, and M&E training introduced MRCS and NMCS staff and broader representatives of MCs to various dashboards and visualization technologies and applications of other organisations, providing the knowledge needed to begin thinking of the possibilities within the MRC and Mekong context. In particular, MRCS presentation on the integrated dashboard concept for all MRC core river monitoring activities during the EGDMF meeting on November 2019 was well received by MC experts, leading to their agreement to

implement the enhancement of the flood bulletins from static PDFs into interactive dashboards. The M&E training has also resulted in MRCS and NMC staff acquiring new technology skills for designing and developing dashboards for water resources applications.

MRC output and activity management, and the performance of its core functions have been enhanced. The financial dashboard has provided senior management access to real-time financial data that allows them to promptly address any concerns particularly related to the judicious implementation of the annual work plan. The increase in the disbursement rate from 62 percent in 2018 to 71 percent (83% if counting obligated contracts) in 2019 can be attributed to some extent to this enhanced capability of management to implement intervention measures before issues deteriorate.

The adoption of modern visualization technologies has increased the effectiveness of MRC’s efforts to disseminate the results of its work to a broader range of users. The interactive version of the Council Study Report allowed this large and complex study to be teased out into clear and easy-to-follow details for a wider range of stakeholders. The interactive report also leads the readers to specific topics that are deemed most important and relevant to them, such as: i) how hydropower development may affect the basin positively and negatively by 2020 and 2040; ii) to what extent the capture fisheries may be affected; iii) whether sediment loads will still reach the Mekong Delta in the future; iv) what sectors may bring the most GDP growth and how rural populations may be affected.

The improvements in the visualization of MRC’s near real-time hydrometeorological monitoring and flood and drought forecasts through the use of interactive graphs and maps have enhanced the quality and effectiveness of reporting as they illustrate more clearly the magnitude and extent of the flooding or drought conditions. This in turn is leading to the more mainstream use of these services by relevant agencies in the MCs, news agencies, and social media.

Finally, it is anticipated that the use of dashboards and visualization tools will be further embedded and mainstreamed within the MRC through a dashboard to track the implementation of the new basin development strategy for 2021 – 2030 and MRC SP 2021-2025. The dashboard system will provide planners, decision makers, funders and other stakeholders with the information necessary to determine whether the plans and processes in the strategy are being implemented effectively and whether BDS Outcomes are being achieved. The dashboard will track progress of activities, achievement of outputs and progress along impact pathways. It will flag key areas of concern where interventions are needed to bring an activity back on course through corrective measures. The dashboard will also track progress towards outcomes through a traffic light display aligned to the strategic and assessment indicators across the Mekong River Basin Indicator Framework. Other potential dashboard applications that are being considered include interactive versions of SOBR and MRB-IF (similar to the Council Study report) that can be deployed over the web and an online SVP tool that could potentially be part of the MRCS toolbox to support basin planning at regional and national levels.

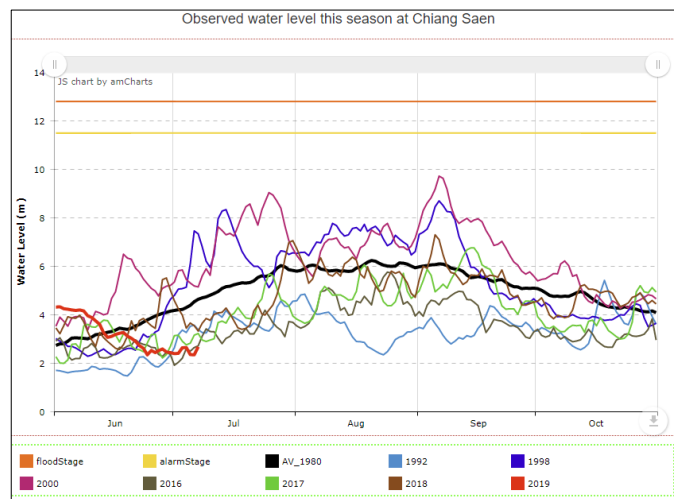


Figure 30: Visualization of Mekong River water levels compared to the long-term average

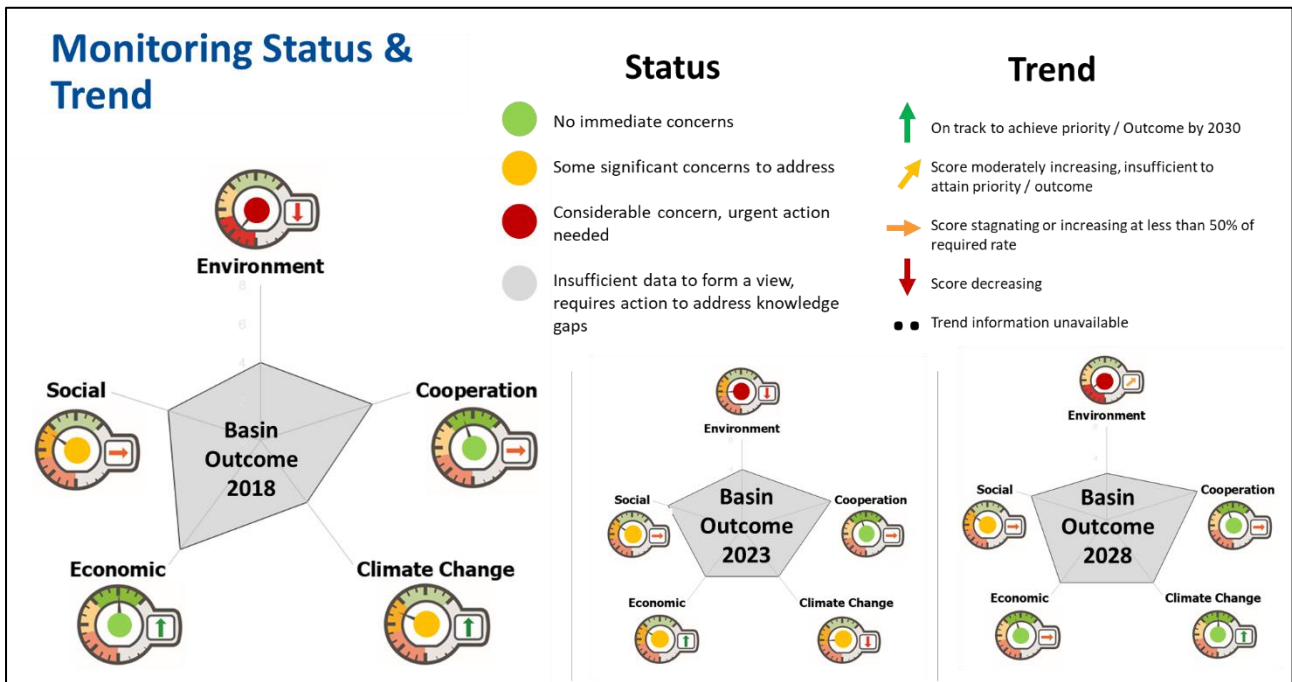


Figure 31: M&E dashboard concept for basin status and trends using MRB-IF

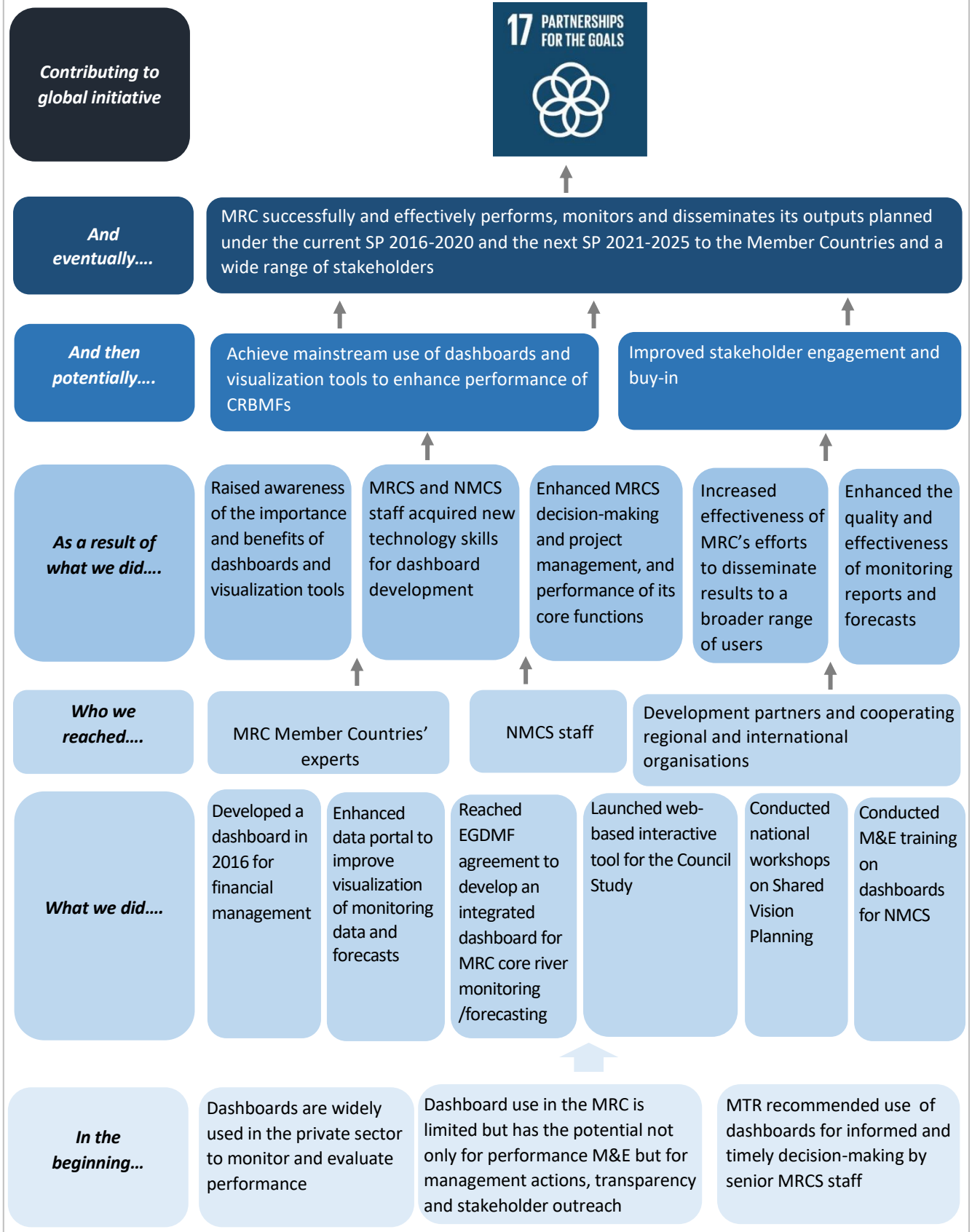
CONTRIBUTION TO SDGs

Dashboards and visualization tools offer the ability to elevate MRC’s performance of its internal operations and core functions including its outreach and communications to the public and a broad range of stakeholders. This enhanced capability will increase the likelihood that the MRC will complete the planned outputs and achieve the desired outcomes as per the MRC SP. This will, therefore, contribute to the achievement of the following SDGs:

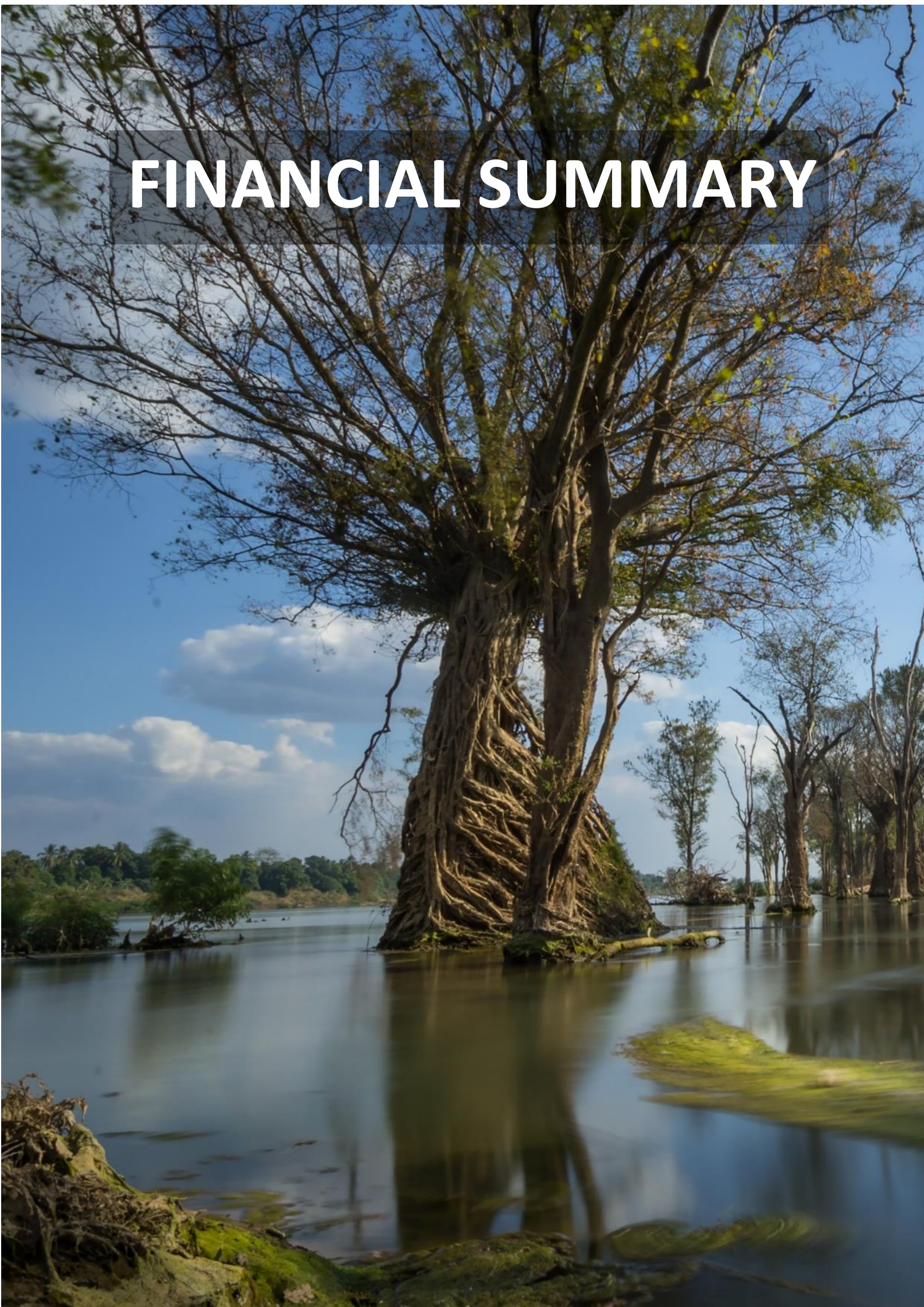
Goal 17: Partnership for the Goals, specifically target 17.8: Fully operationalize the technology bank and science, technology and innovation capacity building mechanism for least developed countries by 2017 and enhance the use of enabling technology, in particular information and communications technology; and 17.9: Enhance international support for implementing effective and targeted capacity building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation.

Pathway to Change

Dashboards developed in support of Organisational Performance and River Basin Monitoring



FINANCIAL SUMMARY



FINANCIAL OVERVIEW

2019 was an exciting year; significant fluctuations in income and expenditure against the budget were recorded. The MRC received a total income of USD 12,242,948, which consisted of USD 6,910,954 for the Basket Fund (BF), USD 5,240,494 for the Earmarked Fund (EF), and USD 91,500 for the Administration Reserve Fund (ARF). On the expenditure side, the total for the year was USD 11,754,724, which included USD 7,156,856 for the BF, USD 4,497,287 for the EF, and USD 100,581 for the ARF. As a result, the movement in fund balance for the year 2019 was USD 488,224.

The opening fund balance on 1 January 2019 was USD 8,673,272, which is carried from the previous year. The total budget (AWP) for 2019 was USD 16,568,932. The disbursement rate was therefore 71%. The disbursement rate for 2019 increases to 83% if obligated contracts and cash advances, at the amount of USD 1,915,450, were included.

In line with the roadmap for self-financing, MCs increased their financial contributions year on year. In 2019, the total contribution from members was USD 3,420,348, compared to USD 3,109,406 in 2018. Besides, in 2019, MRC received a total of USD 8,174,995 from development partners, compared to USD 5,021,943 at the end of 2018. For more detail, see Part 2 of the Annual Report.

INCOME

MRCS receives income from three primary sources: contributions from MRC Member Countries, the contributions from development partners and other income, including interest revenue, the Management and Administration Fee (MAF) charged to earmarked contributions, data sales, etc. By the end of December 2019, the total income received was USD 12,242,948, which was approximately 23% lower than the income projection for the year. This was because some DPs did not transfer funding as planned due to concerns with internal control issues. These issues were resolved by the end of the year.

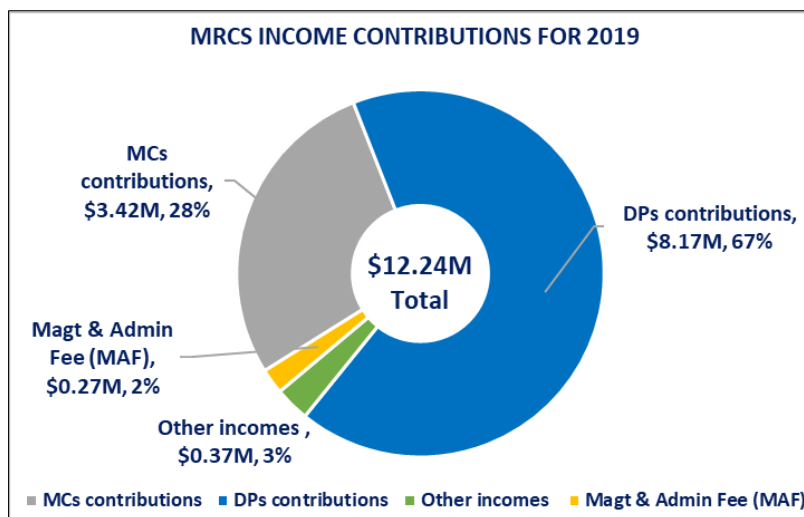


Figure 32: Source of MRC income in 2019

Overall, the income contributions for 2019 consisted of 67% from Development Partners, 28% from MRC Member Countries, and 5% from other income, including the Management and Administration Fee (MAF).

The chart below shows there has been a slight increase in contributions received from MRC Member Countries. There was an overall decline in actual contributions from development partners from 2016 to 2019. This is due to different fund transfer schedules in the overall SP period.

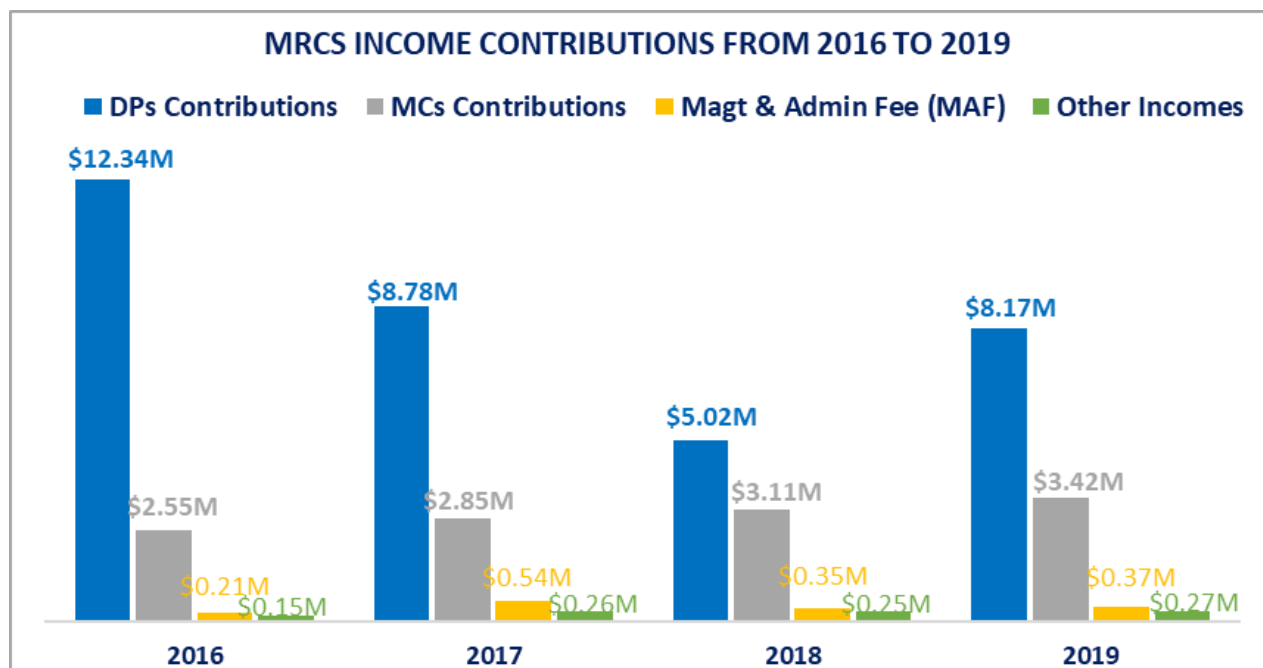


Figure 33: MRC income from 2016-2019

Income break-down by fund type

Income for the Basket Fund (BF): As of 31 December 2019, the MRCS received in total USD 6,910,954, which is equal to 74% of the projected fund transfer for the year 2019. This is 26% lower than the projection.

Income for the Earmarked Fund (EF): MRCS received a total of USD 5,240,494 for the EF for the year 2019, which is equal to approximately 81% of the projected fund transfer in 2019; 9% lower than the projection.

Income for the Administration Reserve Fund (ARF): During the period ending December 2019, there was only interest income of USD 91,500 from the term deposit for the Administration Reserve Fund. No other income was generated for this reserve fund.

Other income: MRCS received a total of USD 0.93 million from data selling services, bank interest, and the Management and Administration Fee (MAF).

EXPENDITURE

Total expenditure for 2019 was USD 11,754,724, a disbursement rate of 71% of the planned budget (USD 16,568,932). Although this is higher than in 2018, the overall actual expenditure of the MRC is lower than the total budget plan for 2019. Yet, if one counted obligated contracts and cash advances of USD 1,915,450, the “disbursement rate” improves at 83%.

The chart below outlines key information on the financial performance of the MRC.

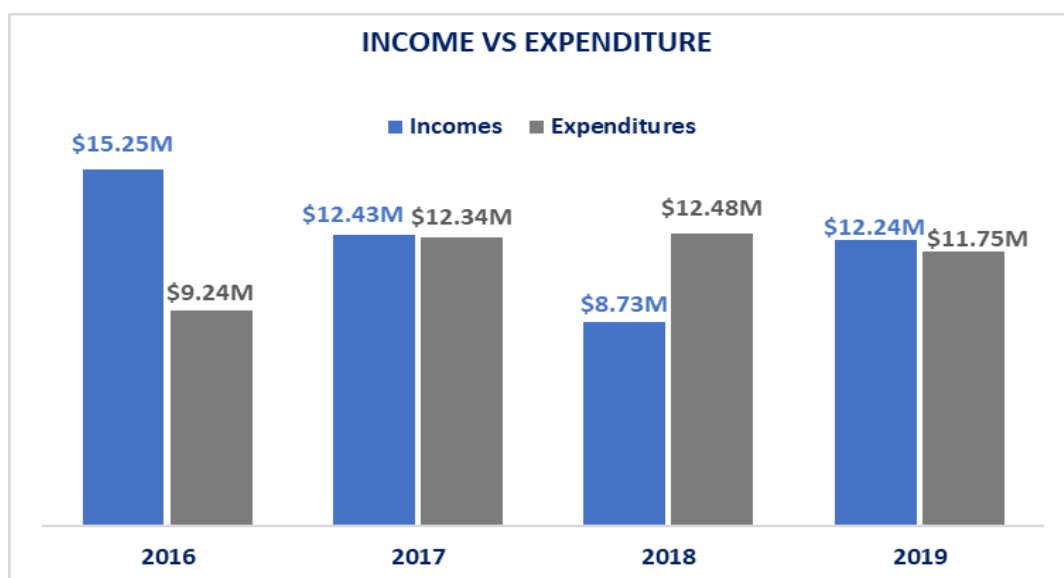


Figure 34: MRC income vs. expenditure from 2016-2019

Expenditure break-down by fund types

Expenditure for the Basket Fund (BF): Over the period, MRCS spent USD 7,156,856, which was about 75% of the planned budget of USD 9,584,048. However, this figure is actual expenditure based on a cash accounting basis which does NOT include obligations (contracts) and cash advances, which will be settled in the following year.

Expenditure for the Earmarked Fund (EF): As of the end of December 2019, the spending of the EF was USD 4,497,287, which was about 65% compared to the EF budget for the year 2019. And if compared to the previous year, expenditure in 2019 increased slightly.

Expenditure for the Administration Reserve Fund (ARF): Utilization of the ARF requires the approval of Member Countries before it can be used. In late 2016, the MRC Joint Committee approved a budget of USD 414,699 from the ARF to cover the costs of office relocation activities from Phnom Penh to Vientiane. Many of the relocation activities were completed in 2017; however, there were a few activities ongoing in 2019, such as the replacement of elevators. Thus, the ARF expenditure for the year was only USD 100,581, and now this activity has been completed.

INTERNAL CONTROL AND AUDITING

The MRCS has appropriate financial controls in place, and these operated effectively and reliably during the past year. Similarly, no significant issues were identified by the MRCS' internal audit process in 2019 as reported by the Internal Auditor during the Budget Committee Meeting in November 2019.

One of the achievements in enhancing the financial control mechanism was that the MRC Audit Committee has started to perform its role. The primary purpose of the MRCS's audit committee is to provide oversight of the financial reporting process, the audit process, the MRCS system of internal controls and compliance with laws and regulations. In the year 2019, five Audit Committee meetings were held, two of which were physical, and three virtual through video conference calls. The meetings were held to:

- Review the audit findings and the drafts of the financial statements.
- Review the year's work and recommended improvements in internal controls not otherwise communicated; approve internal audit plan for coming year; and recommend external auditors for the following year.
- Review operational business and financial risks identified by management and the auditors.

- Management overview.
- Summary of External auditors' most recent management letter.
- Review problem areas noted in the prior year's audit.
- Review sensitive matters (if any).
- Review of internal auditors' reports.

Moreover, as per MRC Member Countries' and development partners' requirements, the new External Auditor Binder Dijker Otte (BDO) has been appointed from 2019 to 2020 to provide Audit & Assurance services to MRCS. The auditor will be working on the financial statement of 2019 in January 2020.

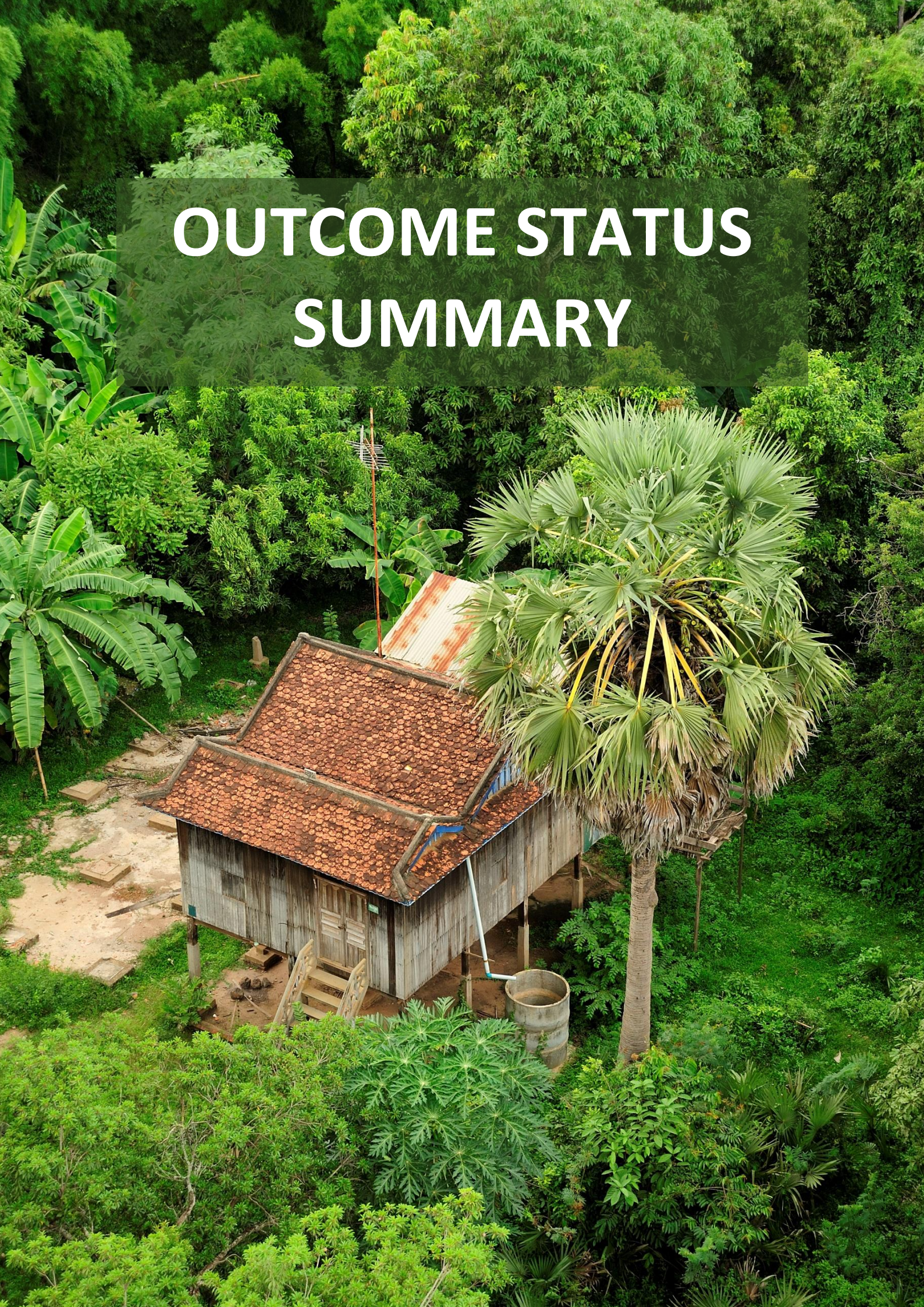
Besides, in early 2019 the previous MRC external auditor, KPMG, audited the MRC financial statement of 2018 and confirmed that the financial statement of 2018 presents fairly the financial position of the MRC. The final audited consolidated financial statement for 2018 was published on the MRCS website.

FINANCIAL MANAGEMENT

During the year 2019 the primary focus has been on:

- Improving and updating the operation manuals such as Administration, Procurement, and Finance manuals, which were approved by the MRC Joint Committee in 2019.
- MRCS has been working with all relevant stakeholders to improve the internal controls, which successfully passed the EU Pillar Re-Assessment.
- Preparing and planning for change-over and the reconfiguring the FMIS to support the new strategic plan and current working arrangements and reporting requirements.
- Support the operation of the MRC Audit Committee and internal auditing process.
- Maintaining the accuracy of accounting records.
- Carefully manage cash flow due to the delayed fund transfer from some DPs.

OUTCOME STATUS SUMMARY



The year 2019 marked significant progress by the MRC towards achieving its MRC SP through implementation of the 2019 Annual Work Plan. The MRC monitoring and evaluation system measures progress at the output level through the Annual Work Plan, the outcome level through the Annual Report, and the key result areas level through the MRC SP.

For the Annual Report, an assessment is made annually on the progress of the organisation to achieve the seven outcomes as defined in the MRC SP. To guide this assessment, an Outcome Evaluation Matrix was applied based on the progress for each output in the MRC SP and the type of change an output has achieved. The output progress was given a status category from high to low: 'on-track', 'not yet started' and 'delayed'. The type of change an output has achieved was assessed from high to low based on type of change: plans, policies and conditions; behaviour, practice or decision-making; or knowledge, awareness and opinion.

Using the results of the assessment of the outputs for each Outcome an overall status was then determined as:

- Almost Certain: change is expected to occur;
- Possible: change is expected to occur but significant effort is necessary to achieve influence; or
- Unlikely: change is unexpected but may occur if critical issues are resolved.

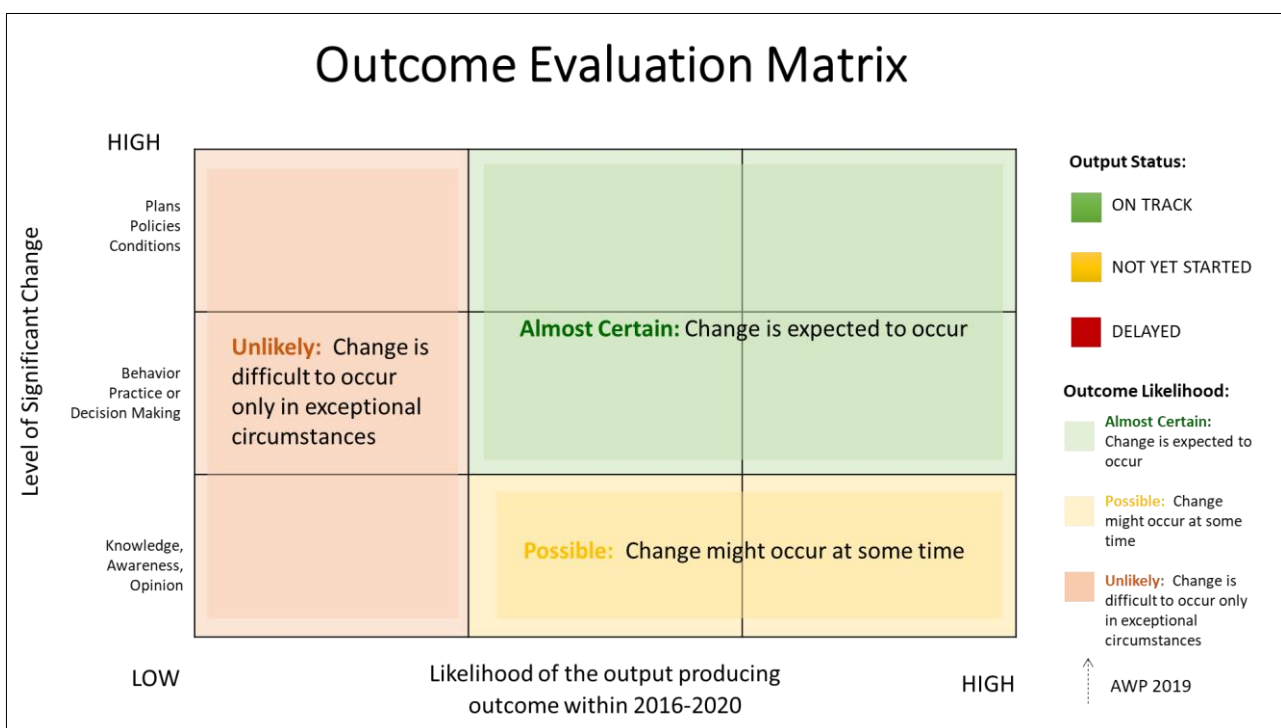


Figure 35: Outcome Evaluation Matrix to assess the progress of each output implemented in 2019

The overall status of each outcome for 2019 is provided below in detail, ascertained using the Outcome Evaluation Matrix and also cross referencing the results of the Mid-term review of the SP. The report card (Table 1), provides a snapshot of the outcomes status for 2019, and identifies key actions to improve each outcome status based implemented through the Annual Work Plan 2020. An assessment is then made of the expected result from implementing these actions for 2020.

Outcome 1 Increased Common Understanding and Application of Evidence-based Decision-making based on or referring to MRC Knowledge Products

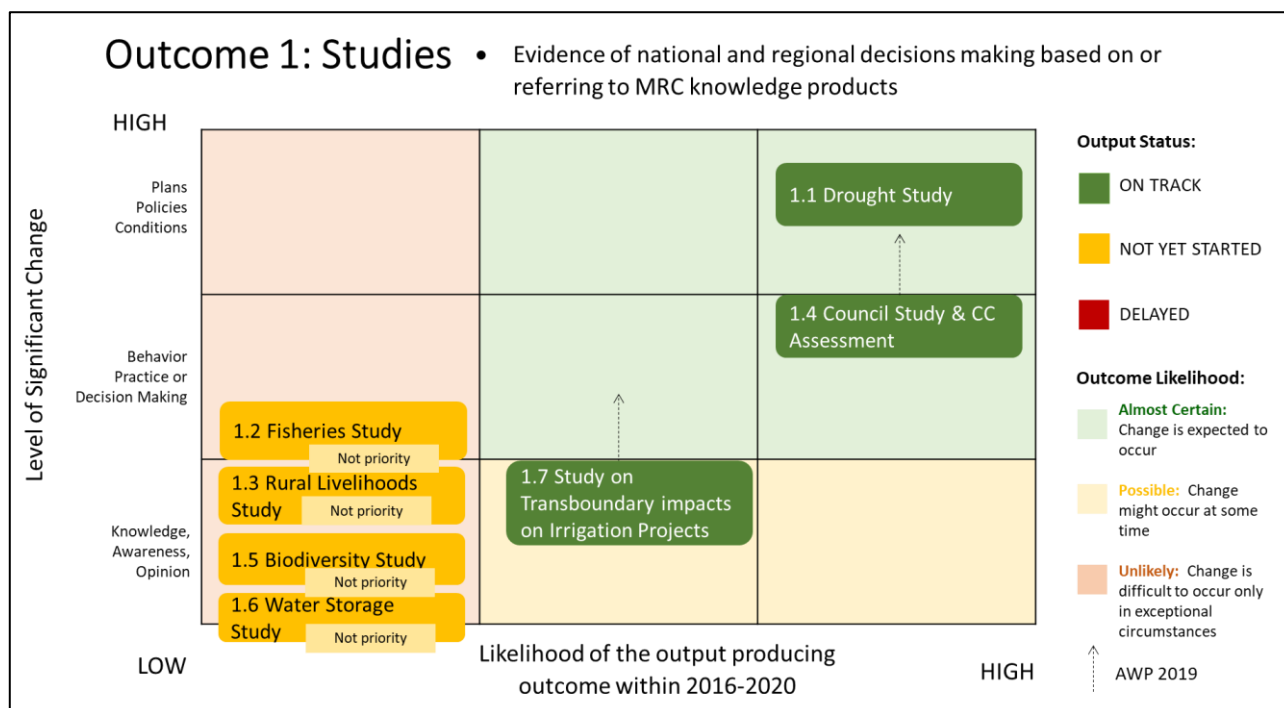


Figure 36: Evaluation Matrix to assess the progress of each output under Outcome 1 implemented in 2019

Likelihood of achieving this Outcome (2019) is: **Unlikely**

Outcome 1 focusses on producing policy-relevant knowledge that contributes to sound decision-making. Examples of this are major studies to support the MRC’s knowledge base, including studies on drought, fisheries, biodiversity, irrigation, and multi-disciplinary studies such as the Council Study.

The likelihood of achieving this outcome is rated as ‘unlikely’ for 2019, with two outputs ‘almost certain’ (1.1 Drought Study and 1.4 Council Study), one output ‘possible’ (1.7 Study on transboundary impacts on irrigation projects) and four outputs ‘unlikely’ (1.2 Fisheries Study, 1.3 Rural Livelihoods Study, 1.5 Biodiversity Study and 1.6 Water Storage Study). The overall status for Outcome 1 has remained with a status of ‘possible’ although there are some realizations of the outcomes related to the Council Study and the Drought Study.

Relevant findings and recommendations of the Council Study have been incorporated into the 2018 SOBR, contributing to improving the knowledge and understanding of the Mekong Basin’s current conditions and trends, and in the development and updates of other products, such as the Environment Strategy, DMS, JEM, and SHDS.

The Council Study results were also published through an interactive tool on the MRC website which conceivably leads to more effective communication of its findings and recommendations to a wider range of stakeholders. The drought study in 2013 has been taken into account in the DMS. The Council Study has produced Output 1.7 on transboundary impacts of irrigation projects and to some extent, has covered some of the aspects of the other outputs on fisheries, biodiversity and rural livelihoods. Finally, the basin trends and long-term outlook as simulated from the various simulation scenarios, are being used to prioritise and facilitate agreement on the BDS strategic priorities, outcomes and outputs for 2021-2030 biodiversity.

In conclusion, the critical action required to ensure this outcome is ‘almost certain’ is to continue to take into account the Council Study findings and recommendations when formulating and updating sectoral strategies, including an emphasis on national uptake. The national uptake plans formulated for the Council Study in

2018 will be reviewed, finalized, and implemented in the context of the national uptake guidance currently under preparation. Finally, an agreement for the next steps for the de-prioritised outputs 1.2, 1.3.,1.5. and 1.6 should be reached and in lieu, take advantage of the relevant aspects already covered by the Council Study.

Outcome 2: Environment Management and Sustainable Water Resources Development optimised for Basin-wide Benefits by National Sector Planning Agencies

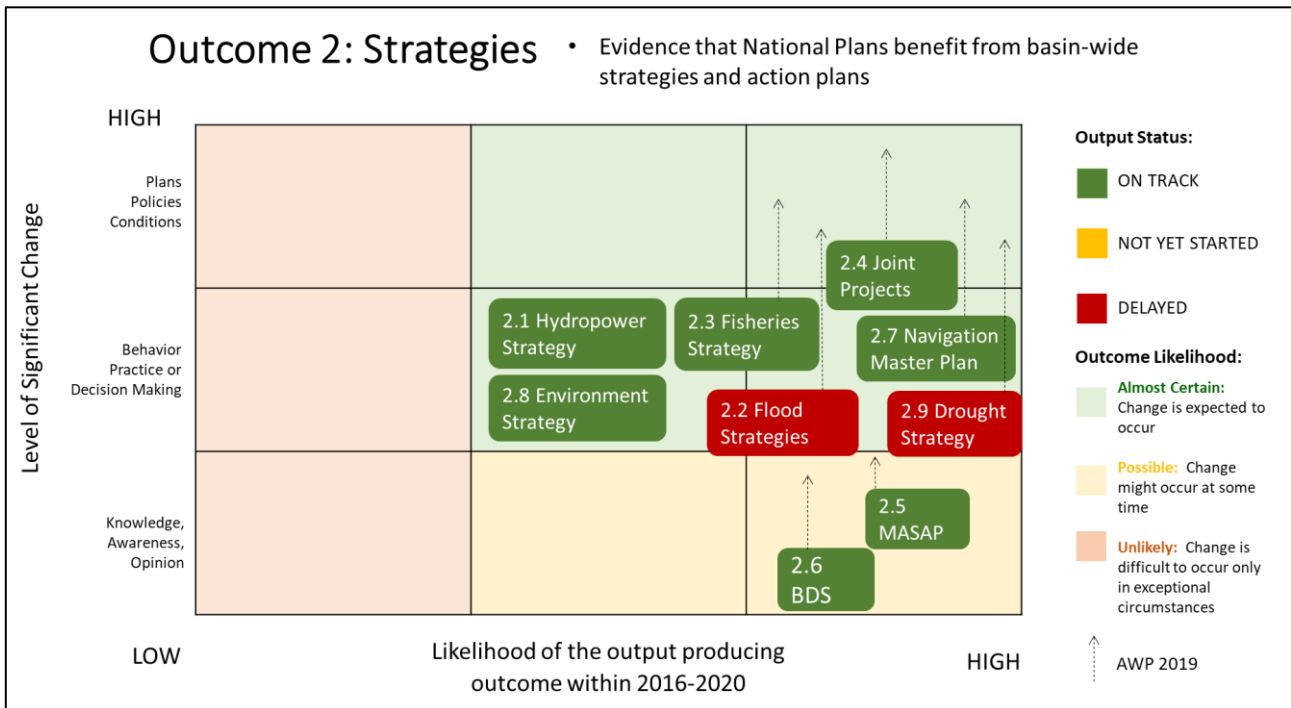


Figure 37: Evaluation Matrix to assess the progress of each output of Outcome 2 implemented in 2019

Likelihood of achievement of this Outcome (2019) is: **Almost Certain**

Outcome 2 is about influencing national plans, prepared mostly for each country’s national context and needs, through basin-wide strategies so that transboundary benefits are optimised and costs reduced. The outputs for this outcome include master plans, joint projects, and strategies for specific sectors or issues including basin development, navigation, fisheries, climate change, drought, hydropower, environment, flood and fisheries.

The likelihood of achieving this outcome is rated as ‘almost certain’ for 2019, with seven outputs ‘almost certain’ (2.1 Hydropower Strategy, 2.3 Fisheries Strategy, 2.4 Joint Projects, 2.7 Navigation Master Plan, 2.8 Environment Strategy, 2.8 Environmental Strategy and 2.9 Drought Strategy) and two outputs ‘possible’ (2.5 MASAP and 2.6 BDS).

The MTR highlighted that a number of outputs under Outcome 2 require ‘major issues to be addressed’ noting that these outputs also tend to be of higher relevance and thus have a greater influence on achieving the outcome. Outcome 2 contains many of the MRC’s flagship activities, and consequently attracts a greater allocation of the overall budget.

Many of these issues were addressed in 2019, bringing the number of outputs that are rated as ‘almost certain’ to bring change, from two to six outputs. 2019 saw the DMS endorsed and approved, the Environment Strategy was fully drafted, and the SHDS along with its action plan went through several revisions. Both Environment Strategy and SHDS are scheduled for JC endorsement and Council approval in

2020. The Fishery Strategy Project-Based Action Plan was completed in December 2019 and will be likewise submitted in 2020 for endorsement by the JC. The joint project under NIP between Cambodia and Lao PDR on cross border water resources development and management in the Khone Falls region has been completed. The planning component of the joint project between Cambodia and Thailand on transboundary cooperation for flood and drought management in the 9C-9T sub-basin has also been completed.

There are a number of examples where the raised awareness and knowledge gained from these outputs led to some encouraging change in behaviour and decision-making. The selection of the list of the 12 prioritised environmental assets of regional importance during the formulation of the Environment Strategy was anticipated to be contentious and challenging. The fact that it was not was an encouraging change for the better in which the MCs strong commitment, increased environmental value, and active participation resulted in the relatively speedy agreement. In addition to raising significantly the institutional knowledge of MRC and MCs, in particular on the pressing drought issues that need to be addressed with urgency, the preparation of the DMS also led to MCs acknowledging and acting on the need to regionally coordinate drought adaptation actions by their respective national line and implementing agencies.

With respect to evidence of national uptake, Lao PDR has successfully secured bilateral funding from South Korea for the implementation of two projects from the 100+ projects in the Master Plan. These projects include the implementation of the international maritime dangerous goods code and provision of the material safety data sheet for inland waterway vessels; and emergency and oil spill response in ports and terminals. The knowledge and experience gained in MASAP have certainly helped MCs secure bilateral funding. These include the Lao PDR MONRE Department of Climate Change, which has successfully secured funding from GEF to develop a national climate change adaptation plan; and Thailand and Viet Nam securing climate change adaptation funding from the UNFCCC Adaptation Fund through UN Environment to implement ecosystem-based adaptation projects. Finally, several regional and national consultations conducted on SHDS have certainly contributed to the increasingly receptive and open stance of Lao PDR in promoting sustainable hydropower development.

Funding has constrained implementation of these strategies, joint projects and plans thereby limiting their potential beneficial impacts and anticipated positive changes, and delaying their integration into national systems. When formulating and revising these strategies and their action plans, MRC not only needs to articulate clearly how they meet national needs in a regional context but also establish the necessary mechanisms to expedite their national uptake. The national uptake guidance that is currently under preparation is intended to address this gap by identifying the various implementing and funding mechanisms that must be considered to encourage national uptake.

In conclusion, the critical action required to ensure this outcome is 'almost certain' is for SHDS and the Environment Strategy to be endorsed and approved, the PBAP for the Fishery Strategy approved and implemented, and DMS implementation initiated. It is also crucial for the initial study to be completed to pave the way for the update of the Flood Strategy. The BDS 2021-2030 needs to integrate the top priorities of sectoral strategies and action plans, and put emphasis on their national uptake.

Outcome 3 Guidance for the Development and Management of Water and Related Projects and Resources shared and applied by National Planning and Implementing Agencies

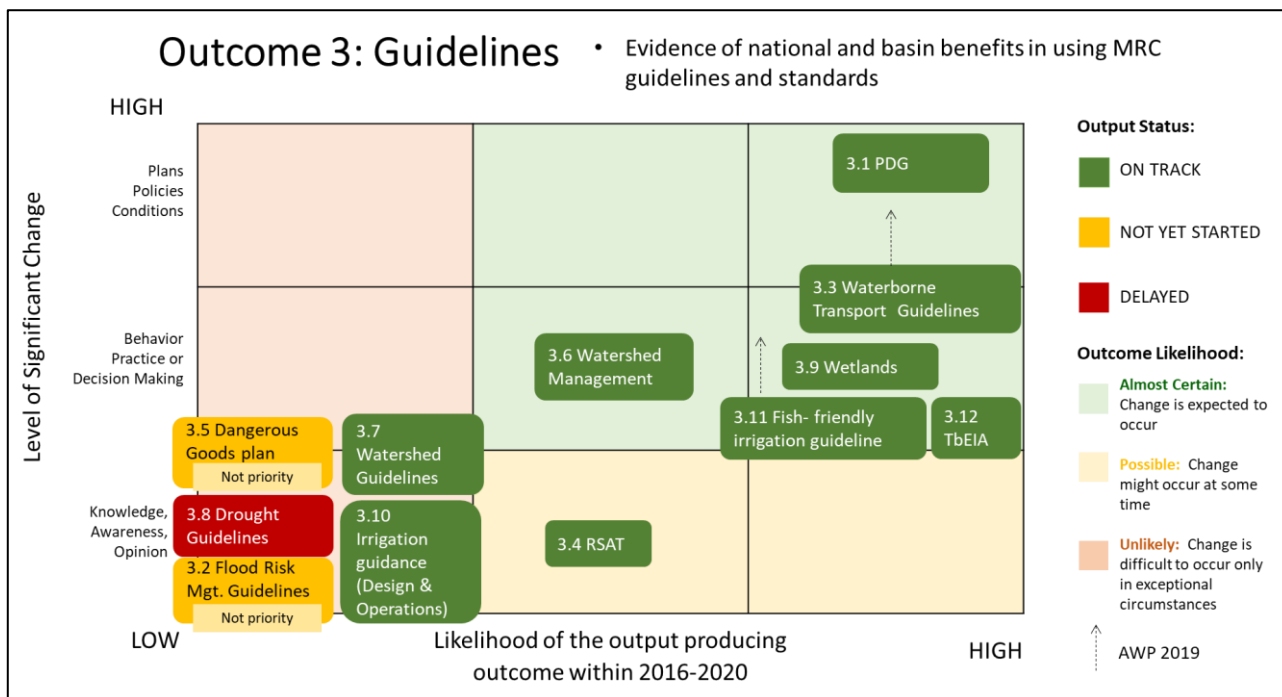


Figure 38: Evaluation Matrix to assess the progress of each output of Outcome 3 implemented in 2019

Likelihood of achieving this Outcome (2019) is: **Possible**

The intention of this outcome is to improve national and regional management, practice and projects of water and related resources of transboundary significance through the use of MRC guidelines and standards.

The likelihood of achieving this outcome is rated as ‘possible’ for 2019, with six outputs ‘almost certain’ (3.1 Preliminary Design Guidance, 3.3 Waterborne Transportation Guidelines, 3.6 Watershed Management, 3.9 Wetlands, 3.11 Fish-friendly Irrigation guideline, and 3.12 TbEIA), one output ‘possible’ (3.4 RSAT) and five outputs ‘unlikely’ (3.2 Flood Risk Management Guidelines, 3.5 Dangerous Goods, 3.7 Watershed Guidelines, 3.8 Drought Guidelines, and 3.10 Irrigation guidance).

PDG continued to receive updates with the latest version completed in November 2019. PDG has cemented its status as the standard guide in developing mainstream hydropower projects in the lower Mekong following its use by hydropower developers for the design of the Pak Beng and Pak Lay projects and during their technical review by MRC during the PNPCA PC process.

With respect to the Waterborne Transport Guidelines, internal rules for the Mekong Navigation Facilitation Committee have been drafted and submitted to Cambodia and Viet Nam, and scheduled for approval and implementation in 2020. Similarly, six sets of rules and regulations on waterway traffic safety, ship safety, passenger protection, crew competency and certification, search and rescue, and emergency response on board vessels have been proposed to Lao PDR and Thailand for approval and national implementation in 2020.

The MTR considers RSAT relevant, and recommends champions to drive its application, regionally and nationally. It was used and applied for technical review of Pak Lay and Luang Prabang projects during its PNPCA PC process. RSAT implementation will continue in 2020, including train-the-trainer workshops for the MCs.

The Fish-Friendly Irrigation Guidelines has been partially revised based on MC’s testing of the guidelines. In partnership with US DOI and ACIAR, fishway construction and monitoring were completed in Cambodia and Lao PDR. The fishway construction and monitoring for Thailand and Viet Nam will be completed in 2020. The Fish-Friendly guidelines will be finalized in 2020.

The testing of the proposed methodology and tool of WI, WEFASAM and WBIA in the four selected wetland sites was completed in 2019. The methodology has been subsequently revised and is now being used for the remaining six selected wetland sites and will be completed by June 2020. The LMB wetland maps, information and database have been continuously updated by the MCs throughout 2019.

Two outputs that were identified as priority activities through the mid-term review; 3.2 flood risk management guidelines and 3.5 regional action plan for sustainable transportation of dangerous goods, will not be completed. Three other outputs (3.7 Watershed Guidelines, 3.8 Drought Guidelines and 3.10 Irrigation Guidance) will not be completed.

In conclusion, the outputs under this outcome should be re-examined and an agreement sought to postpone or modify activities for the next SP. Future work under this outcome should focus on ensuring the national and regional use of the guidelines and standards as a ‘working version’ in special circumstances for sensitive guidelines.

Outcome 4 Effective and Coherent Implementation of MRC Procedures by the Member Countries

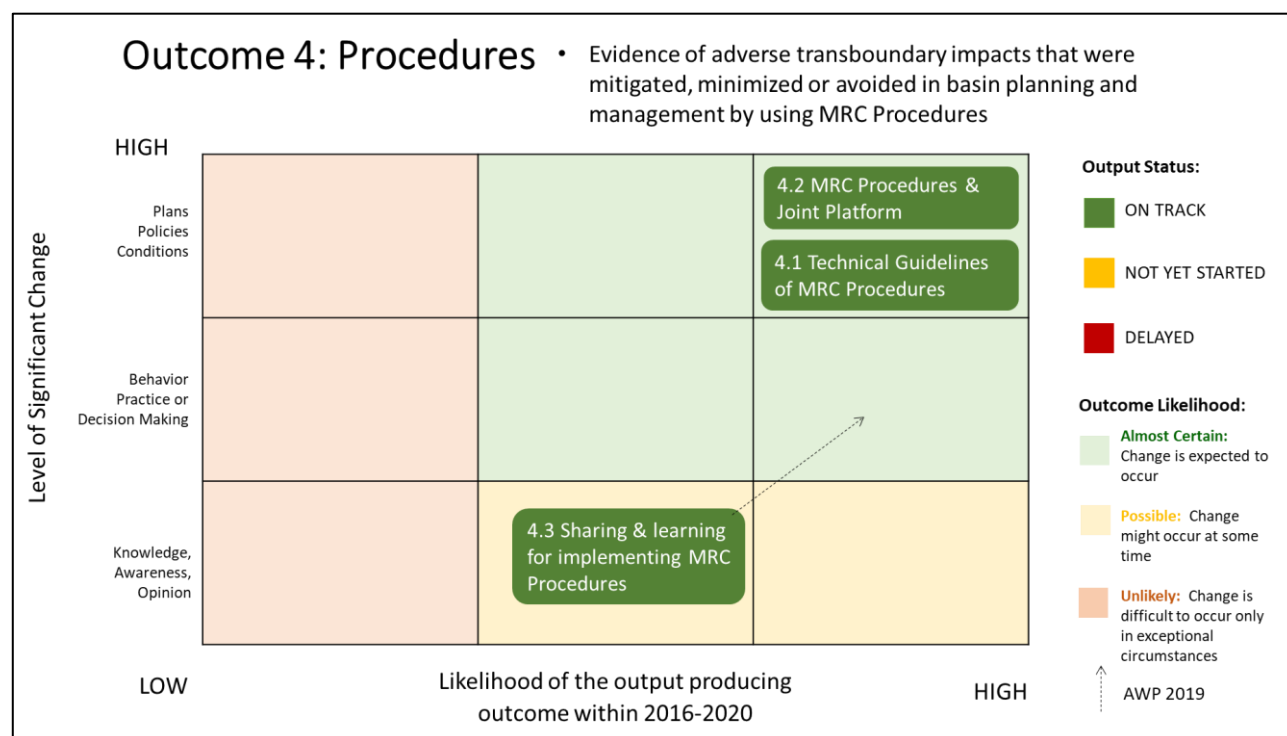


Figure 39: Evaluation Matrix to assess the progress of each output of Outcome 4 implemented in 2019

Likelihood of achieving this Outcome (2019) is: **Almost Certain**

This outcome targets the contribution of the MRC Procedures in mitigating, minimising and avoiding adverse transboundary impacts from development projects.

The likelihood of achieving this outcome is rated as ‘almost certain’, with two of the three outputs ‘almost certain’ (4.1 Technical Guidelines of MRC Procedures, 4.2 MRC Procedures and Joint Platform) and one output ‘possible’ (4.3 Sharing and learning for implementing MRC Procedures). During 2019, the Statements

of the JC and the corresponding Joint Action Plans for Pak Lay and Pak Beng were approved. The PNPCA PC process for Luang Prabang Hydropower project was begun. The Statement of the JC and its corresponding JAP has elevated cooperation among the MCs during the PC process and ensured the process' speedy, deliberate, and action-oriented conclusion. It is expected that the JAPs increase the likelihood that potentially negative transboundary effects will be minimised and mitigated.

As part of continuing efforts to strengthen understanding and capacity to implement Procedures, the training modules on "Understanding 1995 MA" and "Procedures Linkage" were completed.

In conclusion, the MRC needs to focus on implementing the JAPs for Pak Beng, Pak Lay and Luang Prabang Hydropower projects and to continue to strengthen the capacity to implement the MRC Procedures, including water diplomacy.

Outcome 5 Effective Dialogue and Cooperation between Member Countries and Strategic Engagement of Regional Partners and Stakeholders on Transboundary Water Management

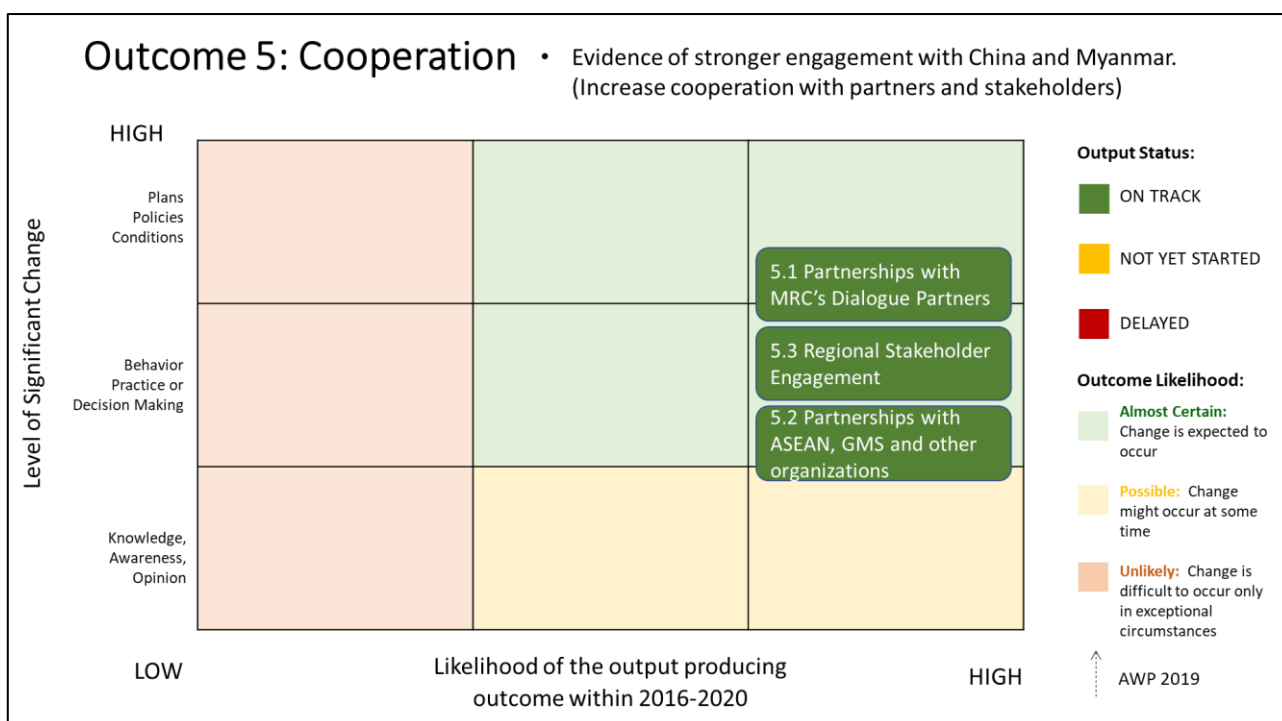


Figure 40: Evaluation Matrix to assess the progress of each output of Outcome 5 implemented in 2019

Likelihood of achievement of this Outcome (2019) is: Almost Certain

One of the aspects of this outcome is to demonstrate close cooperation and collaboration with the MRC's dialogue partners – China and Myanmar – who are critically important in the overall management of the river as the riparian's of the Upper Mekong. Equally important is the engagement with other partners and stakeholders – a distinctive mark of Mekong cooperation through the MRC – in an open, inclusive and transparent manner.

The likelihood of achieving this outcome is rated as 'almost certain', with all three outputs 'almost certain' (Output 5.1 Partnerships with MRC's Dialogue Partners, 5.2 Partnerships with ASEAN, GMS and other organisations, and 5.3 Regional Stakeholder Engagement). The focus on the implementation of these outputs is therefore important to increase the level of impact and significance of change.

2019 saw several milestones completed to support the ‘almost certain’ achievement of this outcome. The strategic cooperation between MRC and its Dialogue Partners – China and Myanmar – has reached a new level as highlighted by the renewal of China’s agreement to share Lancang hydrological data that began in 2002, the granting of the right of the MRC to attend meetings of the MLC Joint Working Group on Water Resources as an observer-participant, and finally at the end of the year, the signing of the MOU between LMC Water Centre and MRCS. The year also saw the strengthening of ongoing partnerships with other river basin organisations, such as the Mississippi River Commission in the U.S., and the revitalization of longstanding partnerships such as that with the Murray-Darling Basin Authority in Australia. The MRC also hosted a meeting to bring together the various Mekong regional cooperation frameworks for the first time, such as the ASEAN Secretariat, the ADB-funded Greater Mekong Subregion Economic Cooperation Program, Ayeyawady-Chao Phraya-Mekong Economic Cooperation Strategy, Mekong-Japan Cooperation, Mekong-Korea Cooperation, Lower Mekong Initiative and the MLC to explore opportunities for improved coordination and collaboration. Finally, MRC intensified its stakeholder communication and outreach efforts resulting in more engaged and effective participation from a broad range of stakeholders, including national civil society organisations and the public.

In conclusion, the MRC needs to continue its efforts to promote and strengthen stakeholder participation, partnerships and collaboration, including more specifically the implementation of the MOUs with China and other partners, and also implementation of the MRC regional cooperation framework.

Outcome 6 Basin-wide Monitoring, Forecasting, Impact Assessment and Dissemination of Results strengthened for Better Decision-Making by Member Countries

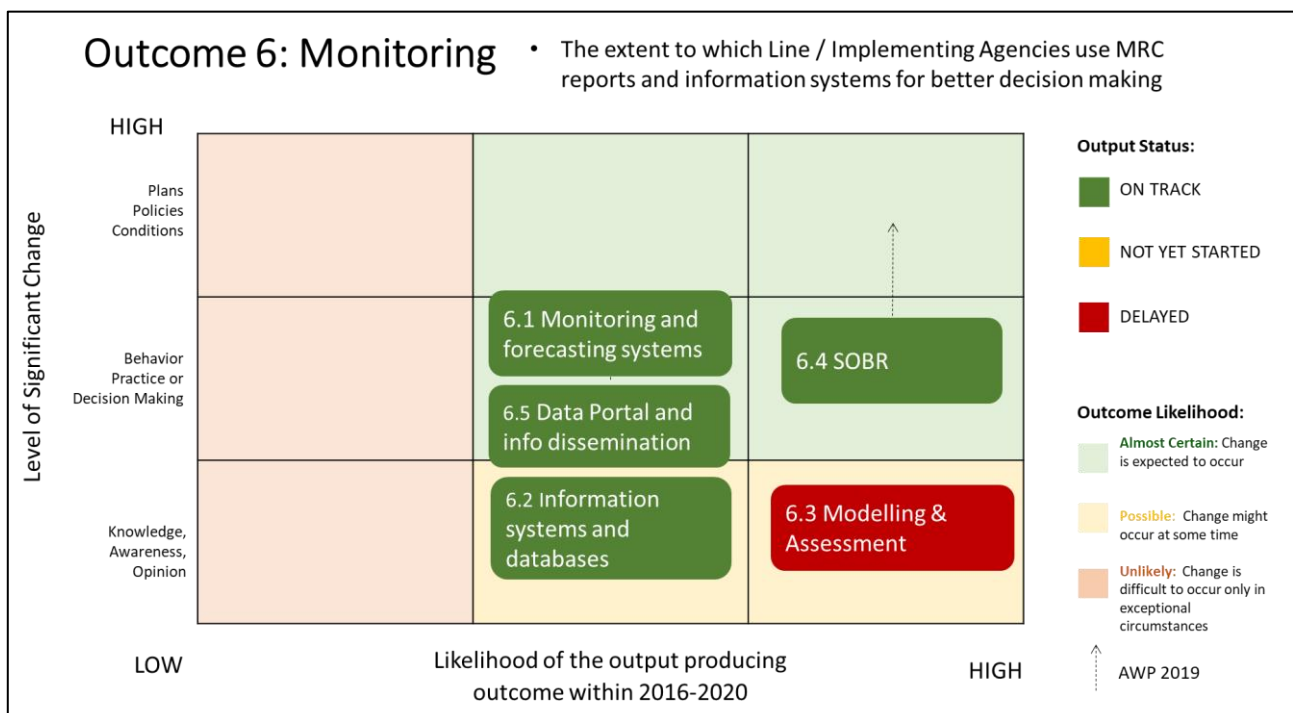


Figure 41: Evaluation Matrix to assess the progress of each output of Outcome 6 implemented in 2019

Likelihood of achievement of this Outcome (2019) is: **Almost certain**

This outcome concerns the MRC’s information system and databases, and relates to the ongoing services required to deliver the MRC’s core river basin management functions. This includes data and information collection, management, dissemination in support of forecasting, emergency preparedness, and

implementation of the MRC procedures and basin water resources planning. By effective implementation of this outcome, the MRC can achieve its aim of becoming a regional knowledge hub.

This likelihood of achieving this outcome is rated as ‘almost certain’, with three outputs ‘almost certain’ (6.1 Monitoring and forecasting systems, 6.4 SOBR, and 6.5 Data portal and info dissemination), and two outputs ‘possible’ (6.2 information systems and databases and 6.3 Modelling and assessment).

The 2018 SOBR, an integral part of MRC’s next strategic planning cycle, was completed and published in July 2019. It is based on the new Mekong River Basin Indicator Framework for the first time and also includes a review of conditions within the upper Mekong Basin, known as the Lancang Basin in China.

In early 2019, the Regional Flood Management and Mitigation Centre, which was established in 2006, was renamed as the Regional Flood and Drought Management Centre (RFDMC) to accurately reflect its expanded scope of services and also to bring the increasing threat of drought in the region to prominence. Continuing improvements in 2019 included the upgrade, operation and maintenance of the supporting monitoring and communication infrastructure, such as the Mekong-HYCOS hydromet network and the near real-time monitoring, flood and drought forecasting websites; the timely delivery of both routine and emergency monitoring and forecasting services by the RFDMC; and the development and dissemination of routine flood and drought products such as bulletins, reports, and advisories.

2019 also saw completion of the strategic initiative to conduct a comprehensive assessment of MRC’s current information system and to prepare a Design Concept for reinvigorating its data, information, modelling, forecasting and communication systems. Moreover, several enhancements of the current MRC data portal were initiated to address to some extent the number of the short-term recommendations of the Reinvigoration Design Concept, which is scheduled for release in March 2020.

In conclusion, the MRC needs to begin preparation of the implementation plan for the systems reinvigoration, complete the enhancements of the MRC IS data portal and deploy the new version. MRC also needs to continue to maintain the operation of the Mekong-HYCOS meteorological network at a high level and deliver quality and timely flood and drought forecasting services. Output 6.3 will be expedited in 2020.

Outcome 7 MRC transitioned to a More Efficient and Effective Organisation in line with the Decentralisation Roadmap and Related Reform Plans

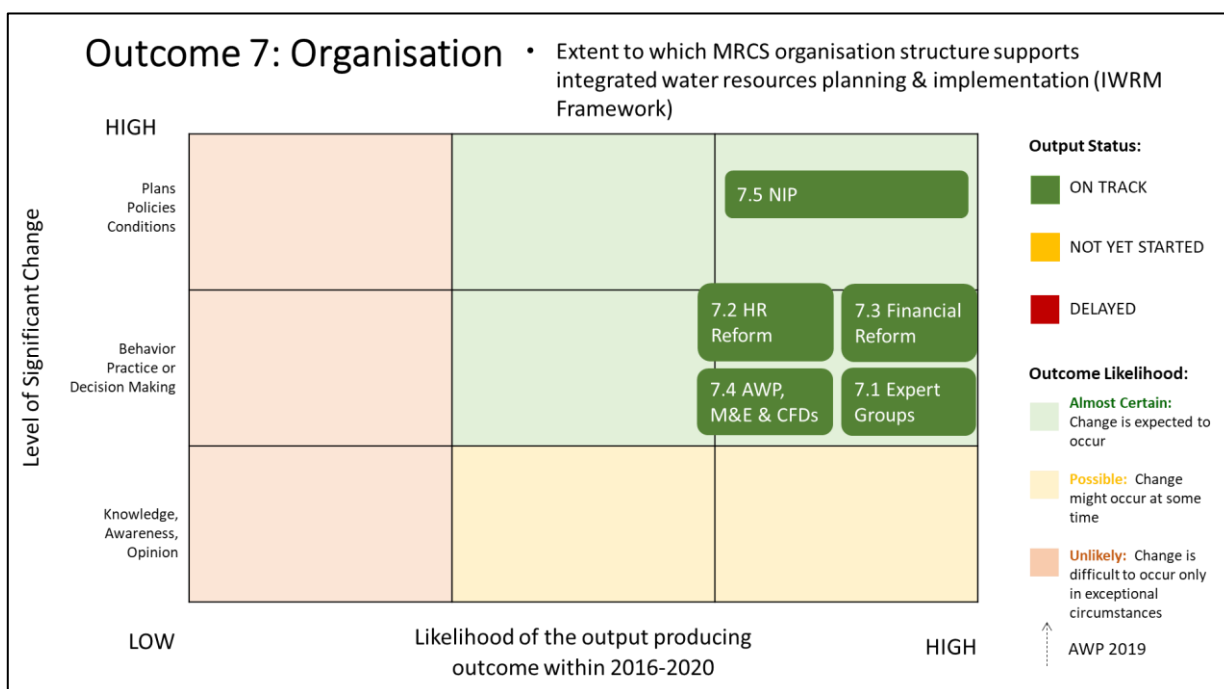


Figure 42: Evaluation Matrix to assess the progress of each output of Outcome 7 implemented in 2019

Likelihood of achievement of this Outcome (2019) is: Almost Certain

This outcome ensures that the MRC organisational structure, associated mechanisms, work plans and operations are efficient and effective in supporting the work of MRC and IWRM. The likelihood of achieving this outcome is 'almost certain', with all five outputs rating 'almost certain' (7.1 Expert Groups, 7.2 HR Reform, 7.3 Financial Reform, 7.4 AWP, M&E and CFDs, and 7.5 National Indicative Plans).

2019 represents the achievement of several key MRC milestones for financial and accounting reforms as part of strengthening its internal operations. These milestones notably include the establishment of the Internal Audit Committee, and the revision of the operation manuals (i.e., Administration, Finance, Procurement and HR). The completion of these milestones have culminated in the MRCS passing the European Union (EU) Pillar Assessment in November 2019, which provided reasonable assurance to the European Commission as to whether the MRC fulfils applicable requirements with regards to the assessed pillars: internal control, accounting, external auditing, and procurement.

The MRC has also intensified its efforts in using dashboards and visualization tools to continue to improve its financial management, project management, and M&E. MTR has in fact recognized the use of dashboards for M&E as a noteworthy advance by MRC to make the progress of outputs, tasks and activities readily available to MRC staff. An M&E dashboard training for NMCS participants was successfully conducted during which dashboards were developed not only for financial performance monitoring but for tracking and reporting river basin conditions.

In conclusion, members of the Expert Groups should be from relevant and permanent technical experts as per the TOR. Their role in promoting national uptake should be strengthened. The MRC needs to continue to strengthen its internal operations, including resolving a number of functional issues relating to the current financial software. MRC must expedite fund raising to secure funding for the MRC SP 2021-2025.

ANNEXES:

ANNEX 1: CONSOLIDATED AUDITED STATEMENTS AND INDEPENDENT AUDITORS' REPORT

Available at <http://www.mrcmekong.org/assets/Publications/1-v2.MRC-Audit-Report-2019.pdf>

ANNEX 2: ADMINISTRATION RESERVE FUND

Available at <http://www.mrcmekong.org/assets/Publications/4.-MRC-ARF-Audit-Report-2019.pdf>

ANNEX 3: BASKET FUND

Available at http://www.mrcmekong.org/assets/Publications/BASKET-FUND_Audited-Statements-and-Independent-Auditors-Report-31-December-2019.pdf

ANNEX 4: EARMARKED FUND

Available at <http://www.mrcmekong.org/assets/Publications/3.-MRC-EF-Audit-Report-2019.pdf>