

STATE OF BASIN REPORT 2018

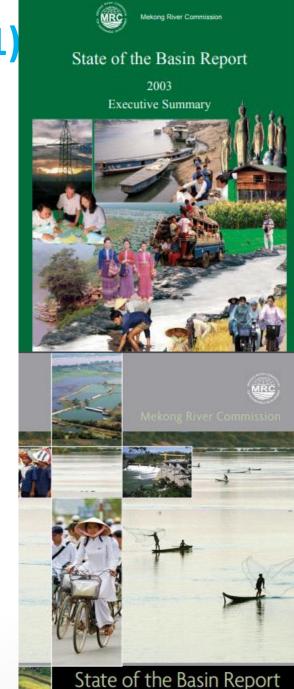
8TH MRC REGIONAL STAKEHOLDER FORUM

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1. Background and Purposes of State of Basin Report (1)

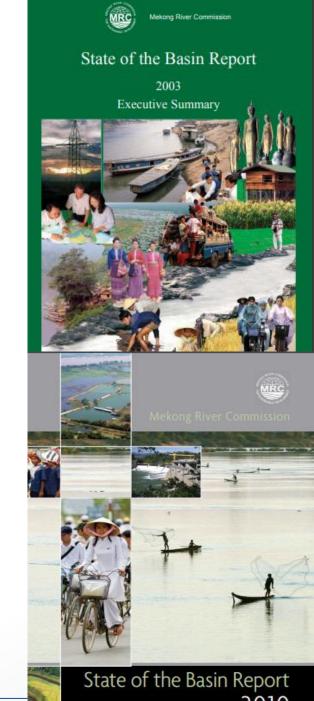
- 2003, The MRC launched its first State of the Basin Report (SOBR)
- 2010, the second SOBR was published and built upon the first SOBR 2003.
- To 2015, a Status and Trends Report and a preparatory State of Basin Report were prepared in lieu of a full SOBR as contributions to the updates of the BDS 2016-2020 and the preparation of the SP 2016-2020.





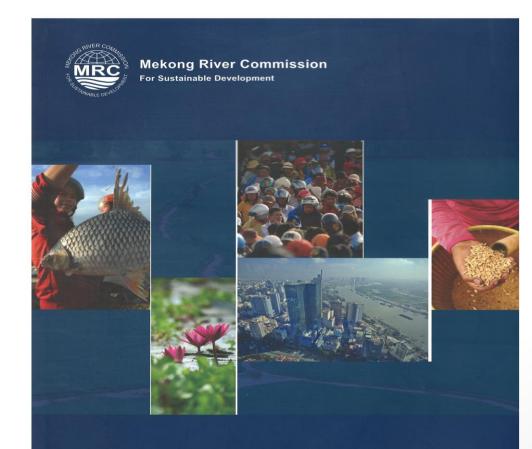
Background and Purposes of State of Basin Report (2)

- The purpose of the SOBR is to provide an overall picture of the Mekong River Basin in terms of:
 - its ecological health and the social and economic circumstances of its people; and
 - the degree to which the cooperation between riparian countries envisaged under the 1995 Mekong Agreement is enhancing the conditions of the Mekong River basin and its people's livelihoods and well-being.



2. Process of the development of Mekong State of Basin Report 2018

- It is the first time that this SOBR 2018 adopted the structure of **newly updated MRC Indicator** Framework (MRC-IF) and also included reviews of conditions within the upper basin in PR China and Myanmar and assess the progress of basin toward SDGs Indicators.
- The MRC Secretariat, with support from four MCs, China and Myanmar, has spent about **four** years preparing, consulting and finalizing the full SOBR 2018.
- In total, more than 60 national, regional and international experts have contributed to the drafting, consultation and finalization of the SOBR 2018.



STATE OF THE BASIN **REPORT 2018**



3. Structure of the SOB Report

The report is presented in 9 chapters (226 pages).

- Chapter 1: described the approach and methodology underpinning the SOBR, including an overview of the MRC Indicator Framework.
- Chapter 2: introduces the Mekong Basin and describes the development context within which the remainder of the report is set.
- In Chapters 3 to 7, the status and trends of selected water-related indicators in the environment, social, economic, climate change, and cooperation dimensions are described.
- Chapters 8 provides a picture of conditions within the Lancang River Basin (UMB) in Myanmar and PR China, respectively.
- Chapter 9: draws together conclusions on the state of the basin, reflects on the impact these have on the UN's SDGs and makes recommendations for consideration in updating the BDS for the period 2021-2025/30 and the SP for 2021+2025. KEEPING THE BALANCE

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- 1 Introduction
- 2 Setting and context
- 3 Environmental status and trends
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- 5 Economic Dimension
- 6 Climate change dimension
- 7 Cooperation Dimension
- 8 State of the Lancang River Basin – Myanmar and PR China
- 9 Conclusions and recommendations

4. Environmental Status and Trends

• Mainstream flows:

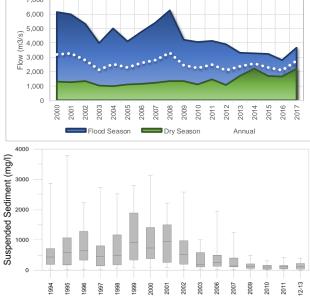
- ✓ Remain compliant with PMFM requirements.
- ✓ Increase in dry season minimum flows.
- Flood season flows in both the upper and lower reaches of the LMB appear to be declining.

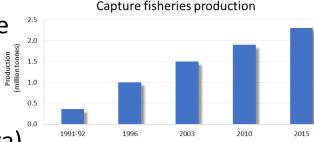
• Water quality, Ecological Health and sediments

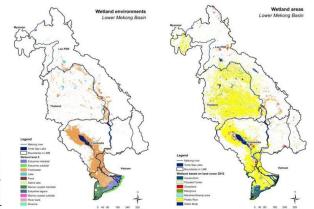
- ✓ Generally good water quality, despite some very high individual readings for some parameters; but with watch points for pesticide and fertilizer use.
- ✓ Suspended sediment concentrations at Chiang Saen have declined considerably.
- ✓ WQM shows some very high EC mainstream readings in 2010, 2016 and 2017 substantially beyond thresholds affecting agriculture (salinity intrusion in the delta).

Environmental assets

- ✓ Wetland decline remains a concern.
- Channel and riparian habitat has declined.
- ✓ Signs of over-fishing with CPUE declining and fish size getting smaller.
- ✓ Increased in introduced species: e.g. 14 exotic fish species
- ✓ Forested area has improved, although questions remain about biodiversity value given the use of plantation forests. MEETING THE NEEDS KEEPING THE BALANCE

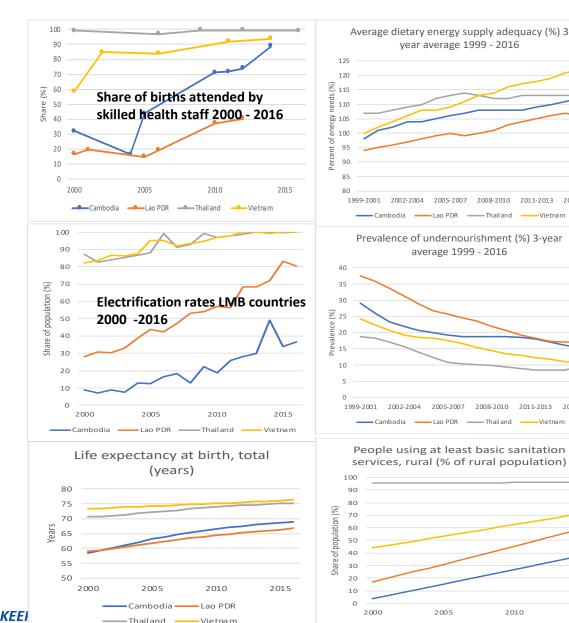






5. Status and Trends of living conditions and wellbeing

- Living conditions and well-being the in LMB have improved significantly over the last fifteen years.
- All countries have experienced improvements in both access to food and nutritional outcomes, more extensive access to water for drinking and agriculture, access to basic sanitation, health facilities, falling mortality rates and increased life expectancy, and improved access to electricity.
- There remains significant variation in performance between LMB countries largely reflecting the differing stages of development.
- Sub-national variation in performance which is not picked up by these largely national level indicators is likely to be important.



2015

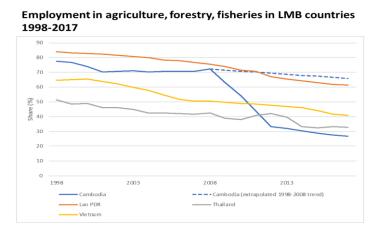
-Thailand

6. Status and Trends of Employment in MRC Water and related Sectors

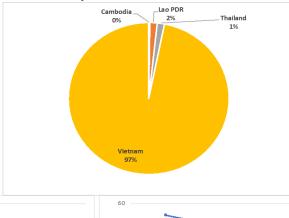
Employment in water related sectors in the LMB remains high:

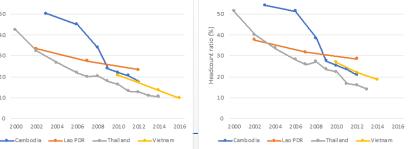
- Agriculture declining as work opportunities in other sectors develop.
- Capture fisheries remains important for livelihoods.
- **Tourism** important and rapidly growing source of employment.
- Poverty rate fallen dramatically across all LMB countries.
- Gender equality Limited evidence on disaggregated data on employment in agriculture and related sectors points to small, but persistent, differences in male and female employment patterns.

	Cambodia	Lao PDR	Thailand	Viet Nam	LMB	Poverty headcount
Fishers	1,009,190	526,300	1,065,900	689,910	3,291,300	ratio at national poverty line in LMB
Fish farmers	80,976	782,800	315,948	279,552	1,459,276	countries 2000 –
Processors	220,464	NA	NA	133,705	354,169	2016, national
Traders	NA	NA	NA	72,786	72,786	
Total	1,310,630	1,309,100	1,381,848	1,175,953	5,177,531	(right) and rural (EEPING THE BALANCE (left)



Share of navigation sector employment by LMB country 2014





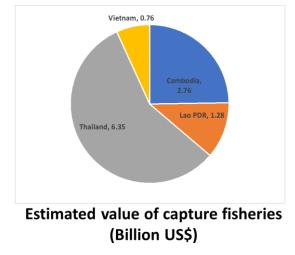
7. Overall Contributions of Basin Economy

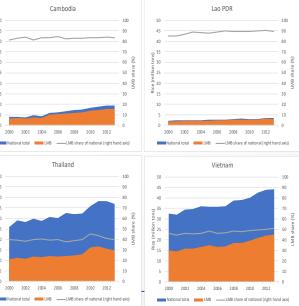
The LMB and water related sectors within it continue to contribute **significantly to the broader national and regional economy.**

- **Rice production important** especially in the Mekong delta to national rice production in Vietnam.
- Hydropower production is important across the basin but particularly in Cambodia and Lao PDR, as are power exports from Lao PDR to Thailand.
- Fisheries and rice production continues to be of critical importance for food grain and protein supply in LMB nations.
- Tourism also likely to be of growing importance at present no LMB data available.

	Cambodia	Lao PDR	Thailand	Viet Nam
Rice production 2015 (gross value)				
National production (million US\$)				
	2,873	1,181	9,585	13,540
LMB production (million US\$)	2,423	816	3,805	5,956
LMB share of national (%)	84	69	40	44
Total fisheries 2015 (gross value)				
National production (million US\$)	3,364	582	9,974	23,379
LMB production (million US\$)	3,001	1,508	6,718	5,740
LMB share of national (%)	89.2	91 ³	67.4	24.6
Hydropower 2015 (gross value)				
National production (million US\$)	588	1,060	12,684	8,124
LMB production (million US\$)	189	1076	58	688
LMB share of national (%)	32.2	100.0	0.5	8.5

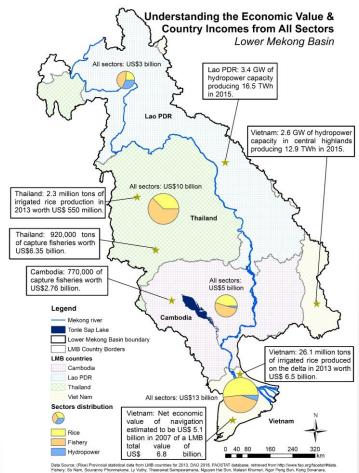
	Country	Total annual electricity demand (Gwh)	LMB hydropower share (%)	5 - 2
	Cambodia	5,990	33.2	40 -
	Lao PDR	4,239	100.0	(s ³⁵ 30 20 8 20 8 20 8 20 8 20 8 20 8 20 8 2
	Thailand	172,090	6.7	20 20 20 21 21 15
	Viet Nam	142,877	9.1	5
NG	Total	324,604	10.0	-





8. Overall Economic Conditions in the Basin

- The broad picture of the LMB is one of economic growth and productivity improvement.
- This is clear from increased production in sectors such as irrigated rice production and hydropower generation, as well as navigation, tourism and fisheries.
- There remain significant difficulties with accurately estimating the economic contribution of natural resources such as wetlands, sand mining and timber forests leading to uncertainty around the values of these resources.
- Enumerating flood and erosion damage remains problematic.
- The development and expansion of hydropower and agriculture in the basin can be expected to have a negative impact on the economic productivity of some of these natural resource sectors.
- Without better valuations for these sectors it is difficult to identify and properly assess these trade-offs.

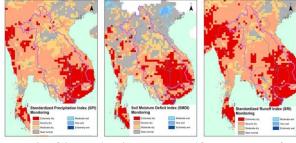


shery: So Nam, Souvamy Phonmakone, Ly Vuthy, Theerawal Sampawaman Myayen Hal Son, Malasi Khumat, Nayer Perg Bun, Kong Sovanara, heter Degen and Peter Starr (2015). LMB series estimation to be worth \$17 billion a year. Catch a culture volume 21, No. 3. December 2015. ydigower: MRC, 2015, Hydrogower Database 2016.

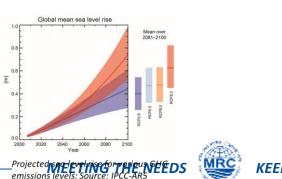
9. Overall Climate Change Patterns and Response

The Mekong be affected by climate change and as response the MRC has included the topic in its activities (MASAP).

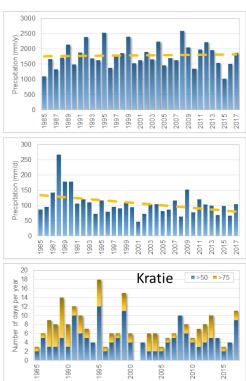
- **To date** trends show a small increase in temperature and for precipitation no clear changes have been observed so far.
- **Climate models** predict increased rainfall and temperature, along with greater variability in the hydrological regime.
- This will lead to an increase in the risk of both floods and droughts.
- In the delta, the most important factor related to flooding is expected to be sea level rise and Salinity intrusion.
- GHG emissions the LMB area are low but emissions are growing rapidly

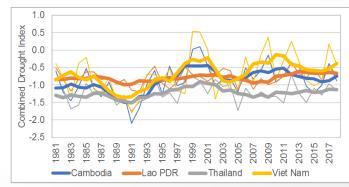


Examples of the LMB drought monitoring and forecasting system f 10th of April, 2016.







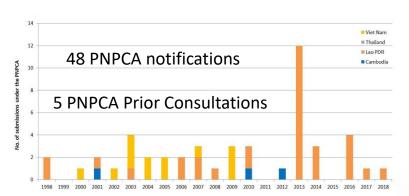


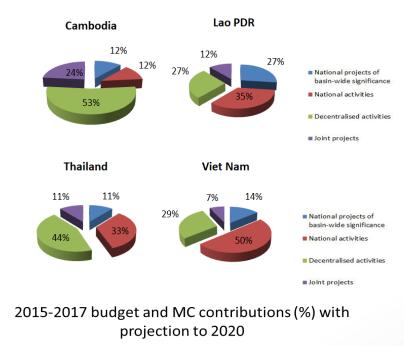
Trends in the Combined Drought Index for the dry season (December to May). Lower values mean dryer conditions compared to long-term averages.

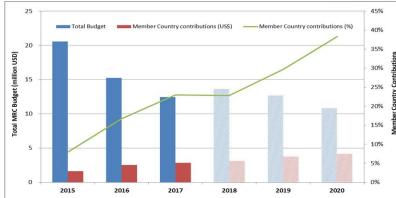
10. Overall Status and Trends of Cooperation in MRC framework

- Overall cooperation between Member Countries is positive.
- There is **considerable engagement** between MCs on projects, joint studies and investigations.
- Dialogue is **frequent and focused** on the range of MRC activities.
- A substantial reform agenda is being implemented with a pathway to self-financing, a new financial management system to increase agility and flexibility in expenditure, and decentralisation of activities is underway.
- The **PNPCA process** is being used.

	Bridge	Hydropower	Irrigation	Total
Cambodia	1	1	1	3
Lao PDR	1	31*		32
Thailand				0
Viet Nam		11	2	13
Total	2	12	3	48







11. State of the Upper Mekong River Basin in China (1)

- The UMB in China contributes approximately 18% of annual Mekong discharge.
- Dam development in particular has impacted seasonal flow dynamics by increases in dry season flows and considerable reductions of wet season flows.
- The UMB-C reservoir cascade has substantial impact on the sediment budget of the Mekong River, with clear reductions of 60-70% in sediment concentrations.
- Construction of dams lacking fish passage facilities, overfishing, introduction of exotic species and has seriously affected fish species richness in the UMB, with significant reductions in fish biodiversity in China.
- Logging in China has significantly decreased due to protected area (PA) management. 29% of the basin holds a protected status.

11. State of the Upper Mekong River Basin in China (2)

- Household living conditions in the UMB of China have **improved** over recent years.
- Household incomes increased by 27% and 31% for urban and rural households, respectively over 2013-2016, as well as improved access to electricity (now at 100%) and access to medical facilities.
- Extensive hydropower development has occurred in the UMB of China. The dams with an installed capacity of >100 MW have a total capacity of 19,285 MW (8 large dams) with a further increase of 63% to 31,330 MW planned (5 large). Total reservoir storage capacity is 44 BCM and could be > 62 BCM.
- Dam development has led to a reduced water levels during the wet season and no large flood events on the mainstream have taken place since commissioning of the main cascade.
- **Droughts** are an **increasingly serious issue** in the UMB, especially in the middle section which supports a major part of the population.

12. State of the Upper Mekong River Basin in Myanmar (1)

- Flow in Myanmar has contributed to annual Mekong Flow about 1 4%.
- Water quality in the Upper Mekong mainstream is generally acceptable.
- Several fish migration routes are present in the downstream areas which may be affected by recent dam development in the Nam Lwe sub-basin.
- Illegal logging, expansion of shifting cultivation, mining development and conversion to rubber monoculture continue to decimate its forests.
- 10% of all primary forests disappeared between 2000-2016.
- The UMB in Myanmar is one of the least developed areas of the Mekong Basin. Almost half of the UMB-M population lives below the poverty line, and education levels and literacy rates are only 43%.

12. State of the Upper Mekong River Basin in Myanmar (2)

- Substantial parts of the population lack access to electricity (63%), safe water supplies (35%) or improved sanitation (36%).
- Food insecurity persists, with 32% of all children under 5 reportedly suffering from either moderate or severe stunting in 2010.
- The first major dam (Mongwa: 66 MW) in the UMB of Myanmar opened in 2017 and planned further 7 dams by both Chinese and Myanmar investors.
- Local flash flood events increase in extent and severity in the UMB of Myanmar, due to uphill deforestation, slash-and-burn agriculture and conversion to rubber monoculture.



13. Contribution to Sustainable Development Goals (1)

The Sustainable Development Goals (SDGs) are a collection of 17 global goals set by the United Nations in 2015, succeeding the Millennium Development Goals (MDGs).

Unlike the MDGs, the SDG framework does not distinguish between "developed" and "developing" nations.



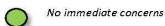
13. Contribution to Sustainable Development Goals (2)

- The aims and intentions of the MRC were established in 1995 under the Mekong Agreement, some 20 years before the SDGs were formulated.
- Nevertheless, the MRC's aims overlap many of the UN's SDGs.
- The SOBR 2018 provides a summary of how the MRC's aims link to the SDGs.

Primary linkages are to:

- SDG 6: Clean water and sanitation
- SDG 2: Zero hunger
- SDG 7: Affordable and clean energy
- SDG 13: Climate action
- SDG 14: Life below water
- SDG 15: Life on land

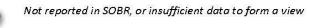
14. Progress towards achieving SDGs in the Mekong Basin



Some significant concerns to address



Considerable concern, urgent action needed



	Targets		Indicators		Current status
SDG6	Ensure availability and sustainable management of water and sanitat	ion for all			
6.1	By 2030, achieve universal and equitable access to safe and affordable drinking water for all	6.1.1	Proportion of population using safely managed drinking water services	\bigcirc	Nationally, by 2015, 70-97% of rural population have access to safe water supplies. LMB specific data not available.
6.2	By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	6.2.1	Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water	0	Nationally, by 2015, Thailand had 95% of its population with access to at least basic improved sanitation facilities, Viet Nam 78%, Lao PDR 73% and Cambodia 49%. LMB specific data not available.
6.3	By 2030, improve water quality by reducing pollution, eliminating	6.3.1	Proportion of wastewater safely treated	0	Not reported on in SOBR
	dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally recycling and safe reuse globally	6.3.2	Proportion of bodies of water with good ambient water quality	0	Mainstream and tributary water quality generally suitable for human and environmental purposes with only minor pockets of concern.
6.4	By 2030, substantially increase water-use efficiency across all sectors	6.4.1	Change in water-use efficiency over time	0	Not reported on in SOBR
	and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	6.4.2	Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	0	Water abstractions remain at levels that allow minimum acceptable flows in the mainstream in accordance with MRC agreed criteria
6.5	By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate	6.5.1	Degree of integrated water resources management implementation (0-100)	\bigcirc	LMB countries committed to overall basin planning, have adopted Basin Development Strategy and are taking up joint projects
			Proportion of transboundary basin area with an operational arrangement for water cooperation	\bigcirc	MRC policy, procedures and strategic guidelines in place covering entire LMB for equitable and sustainable use of Mekong water resources
6.6	By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	6.6.1	Change in the extent of water-related ecosystems over time	•	The decline in wetlands continues and the quality of fisheries resources is reduced. Deforestation appears now to be being reversed in some areas. Mainstream flow regime changes induced by new storages threaten eco-systems
6.A	By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies	6.A.1	Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan	0	Not reported on in SOBR
6.B	Support and strengthen the participation of local communities in improving water and sanitation management	6.B.1	Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management.	0	Not reported on in SOBR

15. Conclusions (1)

- 1. Development pressures have **increased** as a result of growing populations and expanding economies.
- 2. Living conditions within the basin generally are **rapidly improving**, this has come at some **considerable cost** to the environment.
- 3. Key areas of **concern** are the seemingly permanent **modification** of mainstream flow regime, the **substantial reduction** in sediment flows due to sediment trapping, the **continuing loss** of wetlands, the **deterioration** of riverine habitats and the **growing pressures** on capture fisheries.
- 4. At present, although temperature and sea level rise are **the only discernible impacts** of climate change within the basin thus far, MCs are **actively putting measures** in place to address the predicted future changes.



15. Conclusions (2)

- The use of water and natural resources within the basin is giving rise to substantial economic benefits. At present these are not equally shared as some MCs have only recently started to develop their potential.
- 6. Concerns naturally exist, however, at the evident trade-offs between some of these developments and their negative impacts upon the environment.
- 7. To achieve the 1995 Mekong Agreement, the joint efforts of all parties, the challenges identified in this report underscore the need to further strengthen cooperation through enhanced basin planning and strengthened ties with the upstream dialogue partners.
- 8. Furthermore, **increased efforts** are needed to find **better** and more **cost-effective ways** for the MRC to fulfill its **core function** of monitoring relevant conditions within the basin.

16. Summary of conclusions, challenges and recommended priority actions

CUOIIS			No immediate concerns	0	Some significant concerns to address	Consi neede		ent data to form a view, 1 ge gaps	equires action to
Strategic indicators	Key strategic questions		Status /condition		Challenges		Recommended priority act	tions _{Re}	BDS commendation
Environment									
Water flow conditions in mainstream	Are the conditions of water flow in the Mekong mainstream acceptable?	0	Generally compliant with PMFM, but induced changes in flow regime are o some concern	of	Managing the impacts of an apparent decrease of wet season flow during the recession period, the increase in dry sea low flows and the increase in daily fluctu	ason Jation	Continue monitoring programmes and PMFM reporting, monitor decreases in and daily fluctuations and consider im that may arise,	n wet season flows plications of impac	ts
					in flows experienced in some reaches of mainstream.	rtne	Improve monitoring of water use for v ensure balance is maintained with inc		B
Water quality and sediment	Are the conditions of water quality and sediment		Generally compliant with PWQ, but sediment concentrations much		Identifying and implementing practical measures to mitigate the effects of reduc		Continue the sediment and water qua programmes.	lity monitoring	А
conditions	acceptable?		reduced		sediment concentrations and minimise fu reductions	further	Address the implications of reduced s concentrations through mechanisms t sediment flows and mitigate transbou reduced concentrations	o better manage	с
Status of environmental assets	Are key environmental assets in the Mekong basin being adequately preserved		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	-	Agree clear regional objectives, joint s plans for protecting and sustainably m remaining environmental assets and f	nanaging the	n D
	and protected?				wetland and riverine habits		Establish regular monitoring and data address knowledge gaps and conserv wetlands and other environmental ass fisheries.	vation activities for	в
Social									
Living conditions and well-being	What social benefits, direct and indirect, are being derived from water resource developments in the Mekong basin?	0	Living conditions improving but water sector impacts unclear		Provincial and district levels data needed better understand relationship with wate related sectors alongside greater consiste of data quality and accuracy.	er-	Review and refinement of indicators a implement a data acquisition, generati action plan to address knowledge gaps	ion and requiremen	B
Employment in MRC water- related sectors	How are the river-related livelihoods in each country being affected by land and water management decisions?	٢	More information is needed to form a view		As above		As above		В

Strategic indicators	Key strategic questions		Status /condition	Challenges	Recommended priority actions	BDS ecommendation
Economic						
Aggregate economic value of MRC water- related sectors	What economic value does each Member Country derive from the use of the Mekong river system within the water-related sectors?	0	More information is needed to form a view	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	B
Contribution to basin economy	How important is the economic value of the water-related sectors to the economy of the basin?	\odot	More information is needed to form a view	As above	As above	B/E
Climate						
change						
Greenhouse gas emissions	To what extent is the Mekong Basin contributing to global GHG emissions?	0	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 emission. Develop and implement a data acquisition, generation a requirements action plan to address knowledge gaps.	
Climate change trends and extremes	Is there evidence of climate change within the basin?	0	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 SOBR Continue hydro-meteorological data collection programmes.	2. В А
Adaptation to climate change	How resilient are the current water infrastructure and plans to climate change?	\bigcirc	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	E
Cooperation						
Equity of benefits from the Mekong River system	How well is Mekong basin development moving towards optimal and sustainable development?	0	Significant development in all countries, but equity considerations need more data as above	Adoption of pro-active regional planning to promote equitable use of basin's resources, together with establishment of a clear mechanism to define equity of benefit and trade-off arising from development in 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 w these aims	E
Benefits derived from cooperation	What is the added value of cooperation under the 1995 Mekong Agreement facilitated by MRC?	0	US\$838m of projects supporting cooperation identified in National Indicative Plans	As above	As above	E
Self-finance of the MRC	Is the MRC on-track to self- finance by 2030?	\bigcirc	MRC budgets in line with achieving self-finance 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	В

17. Key Recommendations

The following recommendations are made for consideration when updating the BDS 2021-2025/30:

- A. Continue and enhance monitoring of environmental conditions; (Hydrology, Sediment, WQ, EHM, and Fish);
- B. Develop and implement a Data Acquisition and Generation Action Plan (DAGAP);
- C. Address the problem of reduced sediment concentrations;
- D. Address the need to take urgent action to preserve and protect remaining environmental assets;
- E. Adopt a more proactive approach to basin planning; and
- F. Maintain and strengthen cooperation with Dialogue Partners and other stakeholders.

18. Next Steps

- 1. Translate the Synthesis SOBR 2018 into 4 MCs languages;
- 2. Support the MCs to organize the national stakeholder forums for wider dissemination of the SOBR 2018 to all relevant national agencies and other stakeholders for information and utilization; and
- Consider to develop the web-based application version of SOBR 2018 for wider use.

