



Mekong River Commission
For Sustainable Development



**Mekong Integrated Water Resources
Management Programme (M-IWRMP-1)**

Transboundary Fisheries Management on the Mekong and Sekong Rivers in Cambodia and Lao PDR

Transboundary Fisheries Management Plan

April 2019



TRANSBOUNDARY FISHERIES MANAGEMENT PLAN

Transboundary Fisheries Management on the Mekong and Se-kong Rivers in Cambodia and Lao PDR



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ACRONYMS

CFi	Community Fisheries, Cambodia
CNMC	Cambodia National Mekong Committee
CSO	Civil Society Organization
DAFO	District Agriculture and Forestry Office, Lao PDR
DFiA	District Fisheries Administration, Cambodia
DG	District Governor
DLF	Department of Livestock and Fisheries, Lao PDR
FiA	Fisheries Administration, Cambodia
IFReDI	Inland Fisheries Research and Development Institute, Cambodia
KBFMC	Kum Banh (Commune) Fisheries Management Committee, Lao PDR
LARReC	Living Aquatic Resources Research Centre, Lao PDR
LNMC	Laos National Mekong Committee
MAF	Ministry of Agriculture and Forestry, Lao PDR
MAFF	Ministry of Agriculture Forestry and Fisheries, Cambodia
MP	Management Plan
MRCS	Mekong River Commission Secretariat
NMC	National Mekong Committee
PAFO	Provincial Champasak and Attapeu Agriculture and Forestry Office, Lao PDR
PBC	Provincial Border Committee, Lao PDR
PBMC	Provincial Border Management Committee, Lao PDR
PFiA	Provincial (Cantonment) Fisheries Administration, Cambodia
PG	Provincial Governor
RBMC	Regional Border Management Committee, Cambodia
TBFMP	Transboundary Fisheries Management Plan
TBFMB	Transboundary Fisheries Management Body
VFMC	Village Fisheries Management Committee, Lao PDR

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1. INTRODUCTION.

1.1 Project background

In November 2009, the Mekong River Commission (MRC) initiated the Mekong Integrated Water Resources Management Project (M-IWRMP) as a follow-up to the Water Utilization Programme (WUP). The project promotes the principles of Integrated Water Resources Management (IWRM) to support the 1995 Mekong Agreement.

Since 2012, the World Bank has provided support to implement the transboundary and national initiatives of the MRC M-IWRMP in three phases Phase 1 (MRC and Lao PDR, 2013-2018), Phase 2 (Viet Nam, 2016-2021) and Phase 3 (Cambodia, 2016-2021).

The M-IWRM Phase 1 (MRC) includes five transboundary projects - one of them is *the Transboundary Fisheries Management Project for the Mekong and Sekong Rivers in Cambodia and Lao PDR*. The objective of this project is to improve fisheries management in the bordering provinces of Stung Treng and Kratie in Cambodia and Champassak and Attapeu in Lao PDR. This objective was sought by delivering three Outcomes:

1. A Joint Transboundary Issues Paper that identifies transboundary fisheries management issues and challenges in this region;
2. A Joint Transboundary Action (Management) Plan to address these transboundary issues challenges; and a,
3. Transboundary Coordination Mechanism (Management Body) to implement the Transboundary Management Plan.

This Transboundary Fisheries Management Plan and its Annexes represent Outcomes 2 and 3 of the Project. The key findings of Outcome 1 are reflected in this Plan and described in detail, along with a full description of the Project, by MRC (2017).

1.2 The management plan context

1.2.1 The Project area

The Project area covers the Mekong and Sekong rivers in the provinces of Stung Treng and Kratie in Cambodia, and Champassak and Attapeu provinces in Lao PDR (Figure 1). The stretch of the Mekong river contains a dynamic channel environment subject to large and rapid seasonal changes in flow volume, speed and water temperatures. A rich and complex mosaic of channel habitats exist including rapids, deep pools, sandbars, beaches, rock outcrops and seasonally flooded vegetation supporting flora and fauna that are often less well represented, or absent, elsewhere in the lower Mekong basin (Bezuijen *et al.*, 2008)2008. This stretch of the Mekong also contains the highest concentrations of deep pools in the LMB. Deep pools are believed to provide critical refuge habitat for many species including the Mekong giant catfish, *Pangasianodon gigas*, the Mekong giant barb *Catlocarpio siamensis* and other endangered species, such as fresh water ray and fresh water dolphin *Orcaella brevirostris*. The Sekong River is one of the largest tributaries of the Mekong River. In the order of 213 species have been recorded in this river, of which 64 are migratory and 15 are endemic

(Baran *et al.*, 2013)2013. The Sekong also forms part of the Sesan-Srepok-Sekong (3S) – the largest river basin in the lower Mekong basin (LMB) remaining accessible to migratory fish that sustain significant fisheries in the project area and beyond.

As a migratory corridor for many large, highly-prized migratory species of fish and the location of critical spawning, refuge and feeding habitat for many other species of fish, the project area is among the richest fishing grounds in the Lower Mekong basin (LMB).

Fish migrations through the project area are targeted using a diverse array of legal and illegal interceptory gear types including gillnets, bagnets and lee traps. During the dry season, fishers also target high concentrations of fish seeking refuge in deep pools, as well as spawning aggregations of prized, but often endangered, species such as *Probarbus julli* in shallow reaches.



Figure 1 The Project Area

1.2.2 Fisheries management issues in the Project area

The transboundary fisheries issues in the project area that this plan seeks to address are listed below and described in detail by MRC (2017).

1. Declining catch rates and changes to species composition;
2. Increasing (excessive) fishing effort i.e. too many fishers;
3. Weak or ineffective enforcement of fisheries laws resulting in:
4. Capture of small or immature fish, and
5. Illegal gear use.

Increasing and excessive fishing effort, often using illegal gears (e.g. lee traps, bagnets, electrofishing, poisons...etc.) that are highly efficient, target small or immature fish, or deployed in fish conservation zones or protected areas, are believed to be the main causes of reported declining catch rates, the increased capture of small or immature fish, and changes to catch composition. Fishing effort and the illegal gear use have increased in response to growing demand for fish in the project area, weak knowledge and enforcement of fisheries laws, and diminishing returns to effort as fish size and catch rates decline (Figure 2).

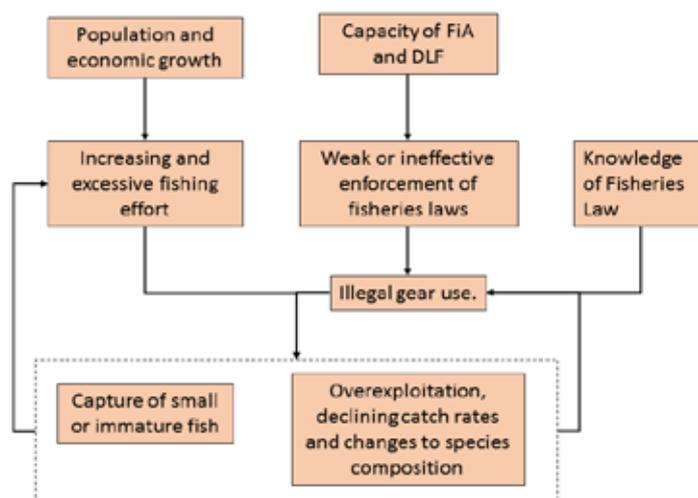


Figure 2 Fisheries management issues in the project area

1.3 Preparation of the Transboundary Management Plan

The project partners, under the auspices of the National Mekong Committees, and with the technical and financial support of the MRCS and the World Bank, prepared this management plan over a period of four years as a means to begin addressing these transboundary issues. For practical reasons, the scope of the management measures included in the plan is presently quite narrow –

seeking only to control illegal gear use at specific, but strategic, locations in the project area. If this pilot plan proves successful, the scope of the plan may be broadened in the future to include other management measures, geographic foci and objectives as required. The process of formulating this management plan involved extensive consultations with fisheries management stakeholders at all levels, exchange visits, and nine joint-planning workshops. Full details of the process followed are by MRC (2017).

2. THE FISHERIES TO BE MANAGED AND INDICATOR SPECIES.

The subject of this management plan are the multi-gear fisheries operating in Champasak and Attapeu provinces, Lao PDR, and in Stung Treng and Kratie provinces, Cambodia, catching migratory *whitefish* stocks indicated by the following species:

6. *Pangasius larnaudii* (*Black spotted catfish*)
7. *Pangasius concophilus* (*Snail-eating catfish*)
8. *Helicophagus waandersii* (*Pangasid catfish*)
9. *Cirrhinus microlepis* (*small-scale river carp*)
10. *Mekongina erythrospila* (*Striped river barb*)

These five indicator species from those caught in the project area were selected by the FiA and DLF using multiple criteria during a Joint Planning Workshop, 4-5 May 2016 in Pakse, Lao PDR. The criteria used to select, score and then rank species were: abundance; commercial importance; importance for food security, long distance migration, occurrence in the Mekong and Sekong rivers within the project area, and whether they were listed as threatened on the IUCN Red List (Table 1). Biological and ecological information relating to these five indicator species is provided in Annex 1.

Table 1 Criteria scores and ranking for the five species selected for monitoring to indicate the performance of the Transboundary Fisheries Management Plan.

Species	Abundant Rank (1-highest 0-lowest)	Market value in Cambodia (2- high; 1-medium; 0- low)	Market value in Lao (2- high; 1-medium; 0- low)	Important for Food Security? (1- Yes; 0- No)	Long Distance Migration? (1- Yes; 0- No)	Located in Mekong? (1-Yes; 0-No)	Located in Sekong? (1-Yes; 0-No)	Threatened? (1-Yes; 0-No)	Overall Rank (10-highest 0-lowest)
<i>Pangasius larnaudeii</i>	0.375	2	2	1	1	1	1	0	8.4
<i>Pangasius conchophilus</i>	0.875	1	2	1	1	1	1	0	7.9
<i>Cirrhinus microlepis</i>	0.5	1	1	1	1	1	1	1	7.5
<i>Mekongina erythrospila</i>	0.125	2	1	1	1	1	1	0	7.1
<i>Helicophagus leptrolynchus</i>	0.625	1	1	1	1	1	1	0	6.6

3. TRANSBOUNDARY FISHERIES MANAGEMENT GOAL.

The transboundary fisheries management goal is: **“Increase migratory fish stocks to levels that maximize their sustainable yields”**.

4. MANAGEMENT OBJECTIVES, INDICATORS AND REFERENCE POINTS

To achieve the transboundary fisheries management goal, the management plan has set the following management objectives:

1. Increase the abundance and yield of migratory *whitefish* species by at least 10 % from their current levels by 2021.
2. By 2021 the use of harmful (prohibited) gears has been controlled for the following illegal gears and locations:
 - a. Lee Traps at the Khone Falls, Khong District, Champasak Province, Lao PDR, and
 - a. Other illegal fishing activities (e.g. gillnet, dynamite, and poison fishing) in the ‘Anlong Chheuteal’ Transboundary Conservation Pool in the Mekong, and
 - a. In the Sekong river in two districts: Xaysetha district in Lao PDR and Siem Pang district in Cambodia.

Targets for each objective and the indicators that will be employed to monitor progress towards these targets are summarised in Table 2 below.

5. MANAGEMENT MEASURES

To achieve the objectives described above, the fisheries authorities of Cambodia and Lao PDR have agreed to implement the following transboundary fisheries management strategy:

1. Reduce the number of Lee traps operating in and around the Khone Falls, Khong District, Champasak Province, Lao PDR (Figure 3);
2. Control (reduce) illegal fishing activities including the use of prohibited fishing gears in the 'Anlong Chheuteal' Transboundary Conservation Pool in the Mekong (Figure 3); and
3. Control (reduce) illegal fishing activities including the use of prohibited fishing gears in the Sekong river in Xaysetha district in Lao PDR, and in Siem Pang district in Cambodia (Figure 3).

Illegal fishing activities and prohibited fishing gears are described in:

1. **Cambodia:** Fisheries Law (2006) and Amendments, Articles 16, 19 – 20, 23-25, 27, 31, 41, 43.
2. **Lao PDR:** Fisheries Law (2009), Articles 10-12, 22-23, 38.

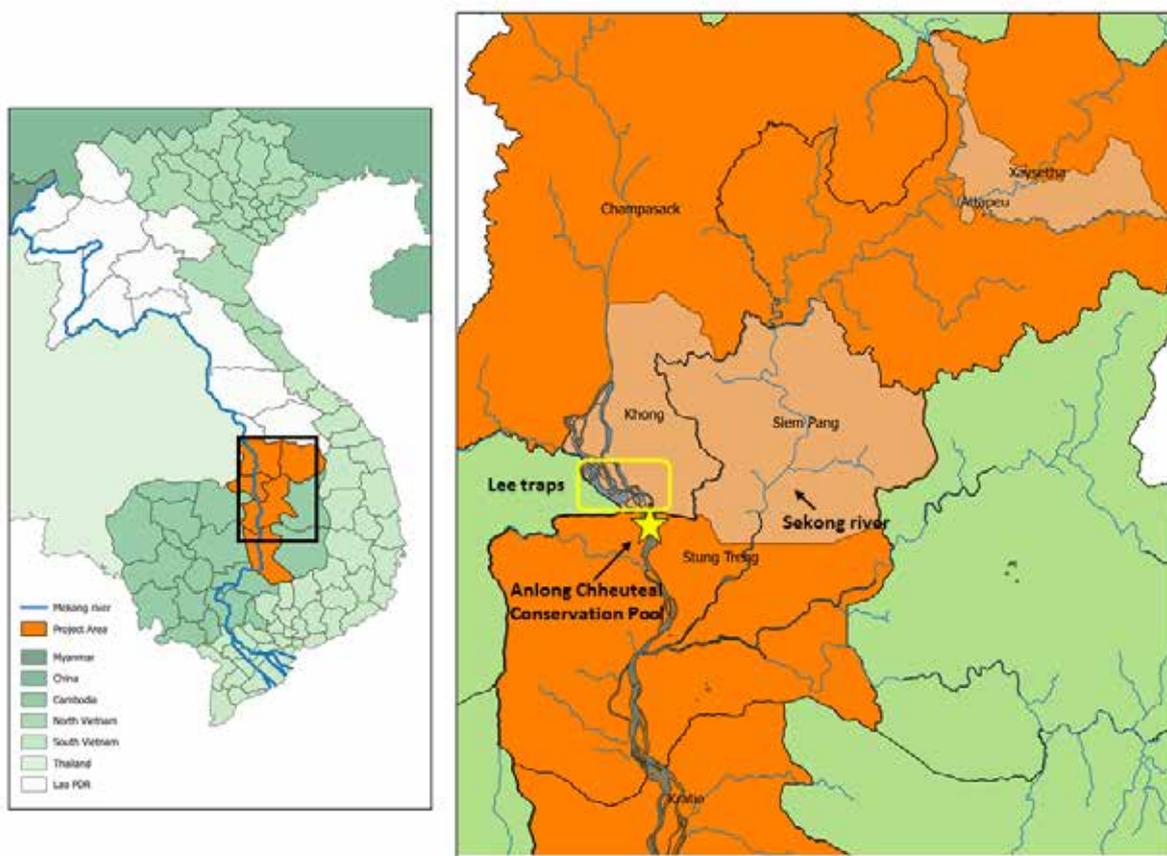


Figure 3 The location of the lee trap fishery and 'Anlong Chheuteal' Transboundary Conservation Pool at the border of Lao and Cambodia, Xaysetha district Lao PDR, and Siem Pang district, Cambodia.

6. DECISION CONTROL RULES.

No decision control rules (DCR) - which describe what additional measures will be taken if the targets (reference points) are not achieved - have been agreed to date. These may be added after the first review of the plan.

7. SUMMARY OF THE MANAGEMENT PLAN

The core elements of the Transboundary Management Plan are summarised below (Table 2).

*Table 2 Summary of the core elements of the transboundary fisheries management plan * This has now be achieved, but bagnets are now common. The management of bagnets at this location will be reviewed during the first TBFMB meeting.*

Transboundary Goal	Transboundary Objectives	Indicators	Reference points (targets or limits)	Management measures (tools)
Increase fish stock to levels that maximize their sustainable yields.	1. Increase the abundance, diversity and yield of fisheries resources by at least 10 % from their current levels by 2021.	1. Average annual fisher catch rate (CPUE) of each species.	1.Target: Catch rate \geq 1.1 x Catch rate at start of plan.	Reduce the use of lee traps (illegal fishing effort) in accordance with Article 38 of the Fisheries Law 2009 of Lao PDR.
	2.By 2021 the following illegal fishing activities have been controlled:			
	(a) Lee Traps at the Khone Falls, and	2(a) Number of <i>lee</i> traps operating at the Khone Falls.	2a. Number of <i>lee</i> traps at the Khone Falls reduced by 80 % from current number by 2021*, and	And
	(b) Other illegal fishing activities (e.g. gillnet, dynamite, and poison fishing in the 'Anlong Chheuteal' Transboundary Conservation Pool in the Mekong, and (c) In the Sekong in Xaysetha district in Lao PDR, and in Siem Pang district in Cambodia.	2(b) & (c) Number of illegal fishing gears confiscated each year, and Number of reported episodes of illegal fishing operations in the Conservation Pool, and in the Sekong in Xaysetha district in Lao PDR, and Siem Pang district in Cambodia (Reported by PAFO/PFiA), and Number of reports of illegal fishing operations in the Conservation Pool, and in the Sekong in Xaysetha district in Lao PDR, and Siem Pang district in Cambodia, as reported by PFiA and DLF based upon reports from CFi and FMC , and Other data sources.	2b. Annual number of reported episodes of illegal fishing operations in the Conservation Pool in the Mekong, and in the Sekong river in Xaysetha district, Lao PDR, and in Siem Pang district in Cambodia, reduced by 50 % by 2021 from current levels.	Control illegal fishing in the Transboundary Conservation Pool in the Mekong, and in the Sekong river in Xaysetha district in Lao PDR, and Siem Pang district in Cambodia.

8. MONITORING AND ENFORCEMENT

Monitoring should cover the fishery situation, inputs to the plan and the indicators selected to monitor progress towards the management plan targets.

8.1 Monitoring management plan performance indicators

8.1.1 *Catch Per Unit of Effort (CPUE)*

The catch per unit of effort (CPUE) or 'catch rates' of fishing operations will be monitored as an index of the relative biomass of the five migratory species listed above. Fishers operating in the project area will monitor their own catch rates. Catch rates for a standard gear type will also be monitored independently by staff from LARReC and IFReDI.

MRC Fisher Catch Monitoring Methodology: Fishers will record daily their catch by species and effort by fishing gear type in accordance with the MRC Fisher Catch Monitoring methodology (MRC, 2007). Fisher logbooks will be collected monthly in Cambodia, and quarterly in Lao PDR. District and Provincial agencies (PFiA, PAFO, DFiA, DAFO) will be responsible for checking the logbooks for completeness and correctness. Data will be entered into the MRC Fisher Catch Monitoring Database (Halls *et al.*, 2013)2013.

Routine Fish Abundance Survey: LARReC and IFReDI will also monitor relative fish abundance and biomass (catch rates) of the five species once per month at fixed locations using a standard multi-mesh gill net, following agreed protocols for setting the nets.

Further details of the two monitoring approaches are provided in Annex 2.

Data will be stored in Microsoft Access databases housed at LARReC and IFReDI. Data entry, checking and processing (analysis) will be undertaken by staff at each institute. Monitoring reports will be prepared annually to support the evaluation of the management plan (see below). Reports may also be prepared for the FiA and the DLF to meet national reporting obligations.

8.1.2 *Illegal fishing activities*

8.1.2.1 *Lee traps*

The number (count) of Lee traps present in and around the Khone Falls area will be monitored at the start of each fishing season (typically May-June). The number of traps present will be identified by PAFO and DAFO staff by means of interview with village officials. PAFO will also request an estimate from the Don Sahong Hydropower Project. PAFO will officially report these estimates to the DLF.

8.1.2.2 *Illegal fishing in the Transboundary Conservation Pool in the Mekong (Cambodian Sector) and in the Sekong river.*

The number of Illegal fishing activities in the Cambodian territorial area (part) of the 'Anlong Chheuteal' Transboundary Conservation Pool will be reported to District Fisheries Officers and the PFiA by local CFi. The PFiA will compile the data and report to the FiA and the Provincial Governor. The monthly data will be compiled by the FiA and reported to MAFF at a quarterly (every 3 months) frequency.

The Inspection Office of the Administrative Department of FiA will conduct routine inspections of illegal fishing activity including the use of prohibited fishing gears in and around the Conservation Pool, for 15 days every month. Prohibited fishing gears will be confiscated. Monthly records of illegal fishing activity and the number and type of fishing gears confiscated will be compiled and reported to the FiA at a quarterly frequency.

8.1.2.3 *Illegal fishing indicators in Conservation Pool in the Mekong (Lao Sector) and in the Sekong*

The number of Illegal fishing activities in the Lao territorial area (part) of the Transboundary Conservation Pool will be reported to DAFO and PAFO staff by local *kum banh* Fisheries Management Committees (KBFMC). The PAFO will compile the data and report the statistics to the DLF at a monthly frequency.

8.2 Other priority data and information

Other priority data and information include variables that can affect the performance of the management plan beyond the management measures that will be implemented. Attempts should be made to account for these variables when evaluating the performance of the plan. If they are found to have a significant effect on the plan, then they should become the subject of additional management attention in the future:

- i. Fishing effort over the range of the stocks: e.g. numbers of fishers, boats, fishing gear types, mean size of fish caught, gear mesh sizes...etc.;
- ii. Other management measures e.g. total area protected or conserved in the river catchment;
- iii. Environmental conditions over the range of the stocks: hydrological variables e.g. water levels, depth, discharge...etc.; water quality variables e.g. temperature, dissolved oxygen, suspended solids...etc.; climate variables e.g. rainfall, temperature; habitat quality and availability variables e.g. spawning habitat area downstream of obstructions such as hydropower dams; total area of flooded-forest; aquatic habitat diversity indices...etc..

8.3 Sharing monitoring programme data

The IFReDI/FiA and LARReC/DLF will exchange their (i)Fisher Catch Monitoring databases; (ii) Routine Fish Abundance Survey data sets; (iii) records of illegal fishing activity, and (iv) other priority data and information, annually. The Fisher Catch Monitoring databases will be shared electronically whereas the other data may be shared in report format unless agreed otherwise.

8.4 Dissemination of data and information.

The FiA and the DLF may choose to disseminate the findings of their monitoring programmes to other key stakeholders to report the performance of the plan and/or to encourage compliance with the measures it contains. Various media may be employed for these purposes.

9. SANCTIONS (PENALTIES) FOR NON-COMPLIANCE

Sanctions or penalties for non-compliance with fisheries-related rules and regulations are detailed in the following national legislation:

1. Cambodia: Fisheries Law (2006) and Amendments, Articles 86-104.

2. Lao PDR: Fisheries Law (2009), Articles 63-68.

This legislation will be applied in cases of non-compliance with the management measures described in this plan.

9.1 Awareness raising of fisheries laws

The FiA and the DLF acknowledge the need to raise awareness among fisher communities of their country's fisheries laws to improve compliance with them. Both stakeholders will continue to strengthen this awareness as part of their mandates to effectively implement this management plan.

10. CONFLICT RESOLUTION

Whenever any conflict may arise between two parties regarding transboundary fisheries issue, conflict resolution will take place at different level of authority as following. It begins at community level (CFI in Cambodia and FMC in Lao). If the conflict can't be resolved at this level, it refers to the district level through a forum involving the district governor. If it can't be resolved at the district level, it is referred to the provincial level by the PAFO in Lao PDR, and by the Provincial Border Committee in Cambodia for resolution. If the issue can't be resolved at the provincial level, then it refers to the ministry level. The TBFMB may also discuss and advise on transboundary fisheries management conflicts.

Refer to the following national legislation:

1. Cambodia: Fisheries Law (2006) and Amendments.

2. Lao PDR: Fisheries Law (2009), Articles 40-42.

11. MANAGEMENT PLAN EVALUATION

The performance of Transboundary Management Plan will be evaluated at the Annual Meeting of the Transboundary Fisheries Management Body (TBFMB). The outcome of this evaluation will be used to recommend and agree changes to the Plan by the TBFMB.

Prior to the Annual Meeting, the IFRoDI & LARReC will independently analyse the monitoring data described in Section 8.1 to compare the indicators against the agreed targets for the Plan using appropriate tables, charts, graphics...etc., resulting in two Country Technical Reports.

On the day prior to the Annual Meeting, the IFRoDI & LARReC will meet to discuss their findings and to agree on a Joint Technical Report for presentation to the TBFMB.

The TBFMB will convene its Annual Meeting. The IFReDI & LARReC will present their joint findings for discussion, and agreement by the TBFMB. The TBFMB will draw conclusions about the performance of the Plan and agree any revisions to the Plan including any action deemed necessary to more effectively implement the Plan.

12. THE TRANSBOUNDARY FISHERIES MANAGEMENT BODY (TBFMB)

The Transboundary Fisheries Management Body (TBFMB) will be responsible for approving this Transboundary Fisheries Management Plan, and subsequently, for joint decision-making and coordination concerning the implementation, evaluation and future revisions of this Plan.

12.1 Mandate and roles of the TBFMB

The Mandate and roles of the TBFMB are agreed as follows:

- i. Attend and report the Annual Meeting of the Transboundary Fisheries Management Body (TBFMB);
- ii. Propose/approve the agenda of the Annual Meeting of the Transboundary Fisheries Management Body;
- iii. Endorse/approve the Transboundary Fisheries Management Plan (TBFMP);
- iv. Prepare plans and activities to implement the TBFMP;
- v. Discuss and advise on transboundary fisheries management conflicts;
- vi. Monitor implementation progress;
- vii. Attend joint meetings/ participate in visits as required;
- viii. Evaluate, and if necessary, revise the TBFMP at the Annual Meeting of the TBFMB.

12.2 Members

Members of the TBFMB will represent key stakeholder institutions (Table 3).

Table 3 Key stakeholder institutions represented on the TBFMB

Lao PDR	Cambodia
Department for Livestock and Fisheries (DLF)	Fisheries Administration (FiA)
District Governor Office	Provincial Governor representative
Provincial Agriculture and Forestry Office (PAFO)	Provincial (Fisheries Administration (PFIA)
District Agriculture and Forestry Office (DAFO)	Local Authorities (District, Commune, Village)
Living Aquatic Resources Research Centre (LARReC)	Inland Fisheries Research & Development Institute (IFReDI)
Village authorities/ kum banh Fisheries Management Committee (FMC)	Community Fisheries Committee (CFC)
Lao National Mekong Committee (LNMC)	Cambodia National Mekong Committee (CNMC)
MRCs	

12.3 Meeting arrangements and activities

The TBFMB will meet annually. Additional meetings can be held as required - probably 2 or 3 per year. The National Mekong Committees (NMCs) will be responsible for organising and chairing the first meeting. Following the first meeting, the national fisheries institutes (FiA and DLF) will be responsible for organising, chairing and hosting the subsequent meetings on the alternating basis. The meeting venue will alternate between the Lao and Cambodia.

The management plan will be reviewed, evaluated and if necessary, revised at the Annual Meeting of the TBFMB following the procedures described in Section 11. The TBFMB will be required to approve any revisions to the management plan.

Meeting minutes and revisions to the TBFMP (if required) will be prepared and circulated for approval following the meeting.

13. STAKEHOLDER ROLES AND RESPONSIBILITIES

The roles and responsibilities of the key stakeholders of this Transboundary Fisheries Management Plan are summarised in Table 4 below.

Table 4 Matrix summarising the roles and responsibilities of the key stakeholders of the Transboundary Fisheries Management Plan

Activity	Sub-Activity	TB-FMB	Provincial or District Governor (rep.)	FiA / DLF	LARReC / IFRReDI	PFiA / PAFO	DAFO/ DFIA	Local Authority/ Khum Bann	FMC / CFI	NMC	MRCS
TBFMB Management & Administration.	Represent the TBFMB and attend Annual Meeting of the TBFMB.		✓	✓	✓	✓	✓	✓	✓	✓	✓
	Organise, chair and host TBFMB (dialogue) Meetings			✓						✓	
	Report activities, findings and recommendations of the Annual Meeting of the TBFMB.			✓							✓
	Prepare and present Joint Technical Report for the Annual Meeting of the TBFMB. (approved by FiA/DLF)			✓	✓						
	Chairing TB Dialogue Meetings	✓		✓						✓	
	Co-chairing TB Dialogue Meetings	✓									
	Propose/Approve Meeting Agenda	✓				✓					
	Minutes of TB Dialogue Meetings	✓				✓					
	Secretary					✓					
TB Management Plan Formulation	Gather data			✓	✓	✓					✓
	Exchange data with TB counterpart institution				✓	✓					✓
	Identify issues for TB Management	✓	✓	✓							✓
	Identify Goals for TBFMP	✓		✓							
	Identify Objectives	✓		✓							
	Identify Indicators	✓		✓							
	Identify targets or limits (reference points)	✓		✓							
	Identify management measures	✓		✓	✓	✓					
	Identify Decision Control Rules	✓		✓							
	Summarise the TBFMP	✓		✓							
	Agree penalties for non-compliance	✓		✓							
	Agree methods for monitoring and evaluation	✓		✓							
Agree/identify financing arrangements	✓		✓								

Activity	Sub-Activity	TB-FMB	Provincial or District Governor (rep.)	FiA / DLF	LARReC / IFReDI	PFiA / PAFO	DAFO/ DFIA	Local Authority/ Khum Bann	FMC / CFI	NMC	MRCS
	Document the plan	✓		✓							
	Endorse/approve TBFMP	✓		✓							
TB MP Implementation	Prepare implementation plans	✓	✓	✓		✓					
	Disseminate/publicise/raise awareness of the TBFMP		✓	✓		✓	✓		✓		✓
	Monitor the fisheries			✓	✓	✓	✓		✓		
	Enforce management plan rules (measures) / Control illegal fishing		✓			✓		✓	✓		
	Resolve conflicts	✓	✓			✓	✓	✓	✓		
	Evaluate (review) the plan and revise if necessary	✓		✓							
	Monitor implementation progress	✓	✓	✓	✓	✓	✓	✓			
	Attend joint meetings/ participate in visits	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Ongoing provision of technical guidance				✓					✓	✓
	Training / capacity building – needs assessment					✓					✓
	Training / capacity building - delivery			✓	✓	✓					✓
	Conduct research			✓	✓						✓
	Data sharing activities?			✓	✓	✓	✓		✓		✓
Ensure international obligations are met e.g. CBD			✓	✓							

14. FINANCING OF THE MANAGEMENT PLAN

The financing of this management plan will be discussed and agreed during the first meeting of the TBFMB and this plan then updated accordingly. The Cambodian Fisheries Administration has prepared the following indicative costs (Table 5) for review and discussion during the first Annual Meeting of the Transboundary Fisheries Management Body.

Table 5 Estimated budget to implement the TBFMP in Cambodia

N°	Activities	Estimated Budget (USD)				Support
		Year 1	Year 2	Year 3	Total	
I	TBFMB Management & Admin					
1	Admin & Operation	8,000	8,000	5,000	21,000	CNMC
2	Material and equipment	12,000	12,000	10,000	34,000	CNMC
II	TBMP Implementation					
3	Prepare implementation plans	7,000	5,000	5,000	17,000	CNMC
4	Disseminate/publicise/raise awareness of, the TBFMP	15,000	15,000	12,000	42,000	CNMC
5	Monitor (the fisheries and implementation progress)	24,000	20,000	18,000	62,000	CNMC
6	Enforce management plan rules (measures) /Control illegal fishing	7,000	6,000	6,000	19,000	CNMC
7	Resolve conflicts	3,000	3,000	3,000	9,000	CNMC
8	Evaluate (review) the plan and revise if necessary	15,000	15,000	13,000	43,000	CNMC
9	Attend joint meetings/ participate in visits	15,000	16,000	17,000	48,000	CNMC
10	Ongoing provision of technical guidance	5,000	8,000	5,000	18,000	CNMC
11	Training / capacity building (needs assessment – delivery)	18,000	15,000	13,000	46,000	CNMC
12	Conduct research	12,000	10,000	10,000	32,000	CNMC
13	Data sharing activities	5,000	5,000	3,000	13,000	CNMC
14	Ensure international obligations are met e.g. CBD	8,000	8,000	8,000	24,000	CNMC
III	Support Livelihood					
15	Support livelihood	30,000	40,000	50,000	120,000	CNMC
	Grand Total	184,000	190,000	182,000	552,000	

15. TERMS OF REFERENCE (TOR)

Terms of Reference (ToR) accompany this TBFMP (Annex 3). These ToR describe the commitments of the Project Partners (FiA and the DLF) to jointly implement this TBFMP. They cover the partners commitments with respect to: enforcement, monitoring, data sharing, reporting, representation on the Transboundary Fisheries Management Body, management plan evaluation and review, and meeting obligations.

ANNEX

1. BIOLOGICAL AND ECOLOGICAL INFORMATION FOR THE FIVE INDICATOR SPECIES

1.1 *Pangasius larnaudii* (Black spotted catfish)

Up to 60 cm TL. Known to occur in large river and floodplains of the Chao Phraya and Mekong basins, where it is one of the most esteemed food fishes. Reared in ponds as well as in weirs around the Great Lake. Feeds on small fishes and some crustaceans as well as a wide variety of vegetable matter and fruits. Migrates into floodplains and spawns at the beginning of the flood season. Taken with seines, gill-nets, hook-and-line, and traps. Marketed fresh. May be put on ice around the Great Lake for shipment to Thailand.

This species is abundant within its range, caught in the wet season lee trap fishery in the Khone falls in Southern Lao PDR, comprising 2.7% of the catch by weight. The population is decreasing due to fishery pressures. This species migrates up river in the Mekong between May and July though it may not be a long-distance migrator. In the dry season, inhabits deep water pools in large rivers. Spawns and young feed in floodplains, takes refuge in mainstream, then heads upstream when sexually mature. Overfishing and dams in mainstream rivers are the main threats to this species. The species is also impacted by the loss of flooded forest habitat in the Tonle Sap Lake and along the Mekong. Monitoring of habitat and population trends is required, especially in relation to impacts of large mainstream dams (Baird, 2012).

1.2 *Pangasius concophilus* (Snail-eating catfish)

Up to 60 cm TL. A mollusc eating species, found in large rivers of the Mekong and Chao Phraya basins. Like *P. bocourti*, this species migrates into the middle Mekong along the Thai-Lao border as water levels and turbidity begin to increase. Feeds primarily on gastropods, and some bivalves and insects. Reproduces early in the flood season and juveniles of 6-7 cm are taken by late June. Caught by seines, gill-nets, traps, and trawls. Marketed fresh.

Found in mainstreams and larger tributaries, migrating up river in the Mekong between May and July, though it may not be long distance migrates in large schools. This species feed on fish, crustaceans, insects and in the rainy season, is an important consumer of flooded forest fruits and leaves in the Mekong. In the dry season inhabits deep water pools in large river. Spawns in mainstream during flood season, larvae swept into floodplains. Overfishing and dams in mainstream rivers are the threats to this species. The species is also impacted by the loss of flooded forest habitat in the Tonle Sap Lake and along the Mekong. Monitoring of habitat and population trends is required especially in relation to impacts of large mainstream dams. The species benefits from community conservation of deep pool habitats in the Mekong (Vidthayanon, 2012).

1.3 *Helicophagus waandersii* (Pangasid catfish)

Up to 50cm TL. Found in large river of the Mekong and Chao Phraya basins, as well as the island of Sumatra. Feeds almost entirely on bivalve mollusks. Migrates upstream when water levels begin to

rise at the beginning of the flood season and moves downstream as water clears at the end of the flood season. Stays in permanent river channels and does not move into flooded forests. Caught with seines, gill-nets, cast-nets, and traps. Marketed fresh.

1.4 *Cirrhinus microlepis* (small-scale river carp)

Up to 65 cm TL. An important fishery species found in large rivers and low-land floodplains of Thailand, Cambodia, and Vietnam. Moves out into the flooded forest where it feeds on leafy plant matter, phytoplankton, and insects. Returns in large numbers to the Tonle Sap in December, with catch steadily declining as the fishing season progresses. Individuals taken in dais or traps. Often kept in fish cages and kept alive after capture for future sale. Caught with seines, gill-nets, traps, and hook-and-line. Marketed fresh and sometimes dried and salted in markets. Not known to persist in impoundments.

This species is assessed as vulnerable due to recent declines in the Mekong of more than 30%, primarily as a result of fishery pressures. However, it is likely that populations would recover if fisheries were reduced, as shown by the population recovery from 1975-1980. However, populations could be expected to decline further if mainstream dams are constructed. It is likely that the species would qualify for a higher threat category if the dams were to be constructed (Baird, 2013a).

1.5 *Mekongina erythrospila* (Striped river barb)

Up to 45 cm TL. A Mekong endemic, inhabiting rapidly flowing water in medium and large sized rivers. Feeds on periphyton and phytoplankton. A valuable and highly desired food fish in northern Cambodia. Taken with seines, gill-nets, cast-nets, and traps. Sold fresh and is sometimes dried and salted.

Found in flowing water, mainly in rocky areas. The adults stay in the upper parts of the basins, whilst the juveniles move down into the mainstream, they migrate up and down the mainstream of the Mekong in very large numbers, where they are caught.

This species is decreasing due to dams and overfishing. In the 3S rivers the populations have been heavily impacted by the Yali falls and the upper Srepok river in Viet Nam. The Lower Sesan II dam, due to be constructed in 2011-12 completely block the migration of juveniles from the Srepok and the Sesan rivers. Dams are also planned in the Sekong which impact this river's populations. The population in the Sesan, Srepok and Sekong rivers in Cambodia, Viet Nam and Laos have declined or are projected to decline as a result of dam construction. The populations in the above three rivers likely represent a very large proportion of the total population (Baird, 2013b).

2. FISHERIES MONITORING PROTOCOLS (SEE SECTION 9)

2.1 MRC Fisher Catch Monitoring.

Catch rates (CPUE) for the five indicator species will be monitored by 24 fishers at six locations in the project area (Table 6;) following the standard MRC Fisher Catch Monitoring method - see MRC (2007). Fishers will be equipped with a standard 60m x 2m multi-mesh (20mm, 30mm and 40mm) gillnet. Fishers will record, in a logbook, their catch (weight and number) by species, fishing effort (net soak hours), and the length and weight of the fish caught.

Table 6 Details of transboundary monitoring locations

Country	Start	River	Province	District	Village/ commune	#fishers
Cambodia	June 2017	Mekong	Stung Treng	Thala	O Svay	3
				Barivath	Sangkat Samaki	3
		Sekong		Siem Pang	Siem Pang	3
					Sdao	3
Laos PDR	Nov 2016	Mekong	Champasak	Soukkuma	Pakua	6
		Sekong	Attapeu	Xaysetha	Sakae	6

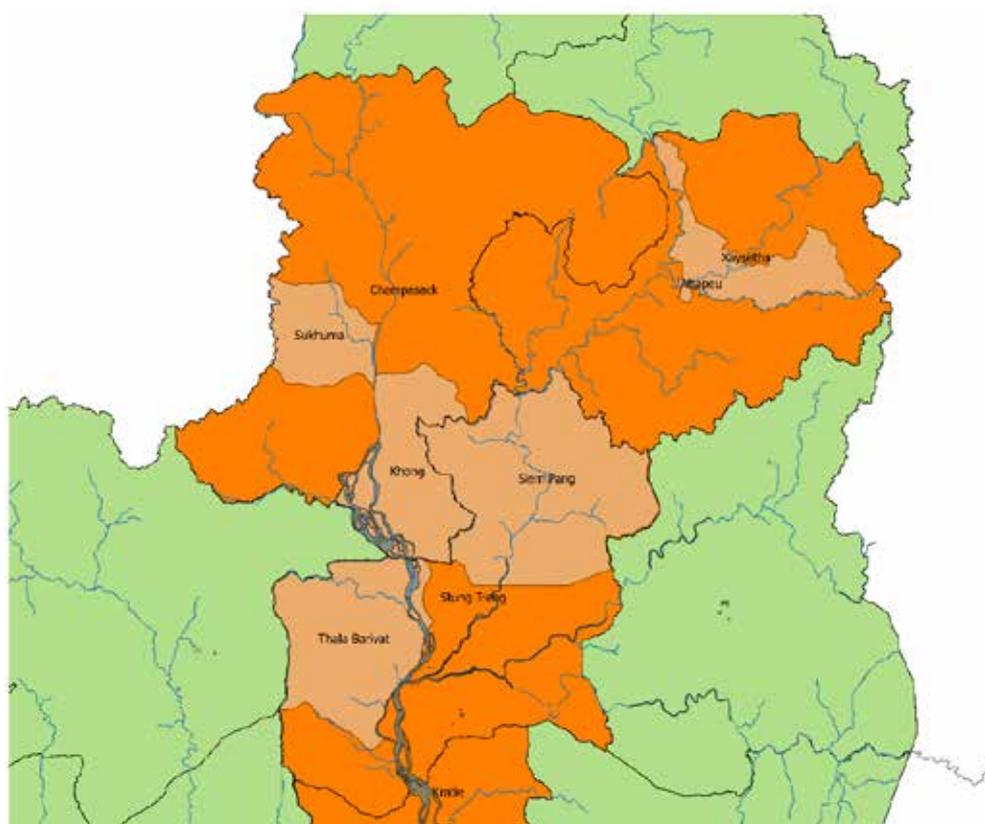


Figure 4 Districts selected for catch rate monitoring

2.2 Routine Fish Abundance Survey

To be completed.

3. TERMS OF REFERENCE FOR THE FIA AND DLF FOR THE TBFMP

See Accompanying PDF document

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Mekong River Commission Secretariat

P. O. Box 6101, 184 Fa Ngoum Road, Unit 18Ban Sithane Neua,
Sikhottabong District, Vientiane 01000, Lao PDR

T: +856 21 263 263 | F: +856 21 263 264

www.mrcmekong.org