

KINGDOM OF CAMBODIA

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MINISTRY OF AGRICULTURE, FORESTRY AND FISHERIES

FISHERIES ADMINISTRATION



**Mekong Integrated Water Resources Management Project
Phase III – Component 1**

TECHNICAL REPORTS

Selection of Community Fisheries for project support



2019

KINGDOM OF CAMBODIA
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SELECTION OF COMMUNITY FISHERIES

FOR PROJECT SUPPORT

Prepared by the
Inland Fisheries Research and Development Institute
for the
Fisheries Administration

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1. INTRODUCTION

The Government of Cambodia has undertaken a project entitled “Mekong Integrated Water Resources Management Phase III (M-IWRM III, 2016-2020)”. The objective of the project is to enhance Cambodia’s institutional capacity and infrastructure to sustainably manage its water and fishery resources in the northeast of Cambodia, and thus more effectively engage in trans-boundary water management. This project is also part of the regional World Bank financed Mekong Integrated Water Resources Management Program, which includes Cambodia, Laos, Thailand, Vietnam, and the Mekong River Commission (MRC).

The project consists of two components:

- Component 1: Support for fisheries and aquatic resources management in Northern Cambodia, managed by the Inland Fisheries Research and Development Institute (IFReDI) of the Fisheries Administration (FiA);
- Component 2: Support for river basin management in the 3S sub-basin and 4P sub-basin and coordination with riparian countries in Northern Cambodia, managed by the Cambodian National Mekong Committee (CNMC).

The objective of Component 1 of the Mekong Integrated Water Resources Management-Phase 3 project is to establish sound fisheries management in the mainstream Mekong between Kratie and Stung Treng, where a significant number of critical aquatic habitats are located.

The project targets are: (i) a minimum of 25,000 people (including 50% female people) will benefit directly from Community Fishery (CFi) activities; ii) 70 CFi will receive support, and iii) 50 CFi out of 70 receiving support will be fully functioning.

The present report is a contribution to the activities of Component 1, whose general objectives are:

- establishing community-based fisheries management organizations between Kratie and Stung Treng in Northern Cambodia, including development of fisheries management plans and demonstration of supplementary livelihood activities;
- strengthening of public sector fishery management, including fisheries monitoring, enforcement of regulations, and supporting indigenous species aquaculture and stocking;
- provision of support for local government capacity building and rural infrastructure.

More specifically, the present report contributes to Sub-Component 1.1 whose activities include:

- identification and engagement with new and existing Community Fisheries (CFi)
- formulation of Management Plans
- implementation of CFi Management Plans, in particular:
 - demarcation of Community Fisheries Boundaries;
 - design and implementation of a fishery monitoring program;
 - enforcement of rules and regulations;
 - evaluation and review of management performance.
- identification of alternative livelihood activities and investments to support fisheries;

In Cambodia Community Fisheries based management is a national strategy initiated in 2000, which has resulted to date in a large number of CFi.

By 2013, 516 Community Fisheries had been established, of which 358 were officially registered by the Ministry of Agriculture, Forestry and Fisheries.

Source: Atlas of Cambodia 2014

As of May 2017, 66 CFi were already registered in Kratie Province and 52 in Stung Treng Province (CDFF database, see section 3.1). Based on the project results framework, the Fisheries Administration planned to gradually recruit new and existing CFi to engage with the project: 10 CFi in 2017; 40 CFi in 2018, and 70 CFi in 2019.

- Kratie: 5 CFi selected in 2017 + 15 in 2018 + 15 CFi in 2019;
- Stung Treng: 5 CFi selected in 2017 + 15 in 2018 + 15 CFi in 2019.

The objective is to ensure that at least 50 CFis are fully functional by the end of the project.

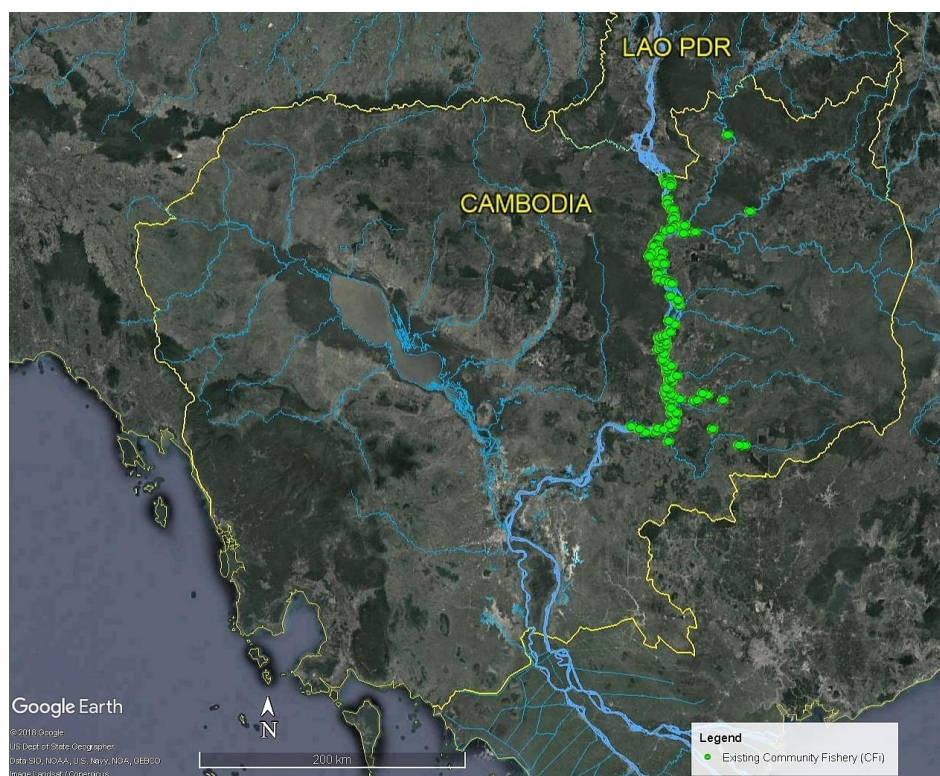


Figure 1: Map of Community Fisheries in Kratie and Stung Treng provinces

The present report details the methodology developed for the identification and selection of fishing communities, in view of developing cooperation, assistance, funding and a monitoring program in those with the best potential to become fully functional by the end of the project. The methodology was developed as rigorously as possible given the investment at stake for the communities selected. This report, finalized in March 2019, reflects and integrates the 2017 and 2018 steps of the procedure; the challenges initially faced, the lessons learnt and the feedback received. The elements amended during Year 1 and 2 of the project are mentioned but are not extensively detailed, in order to keep the final process as simple and clear as possible.

2. PRINCIPLES FOR SELECTION OF TARGET COMMUNITY FISHERIES

One of the large-scale objectives of the IWRM-3 project is to *strengthen fisheries co-management in critical habitats of regional importance*. Through the project, the FiA plans to support at least 50 CFIs to be *fully functional* i.e. having an accepted management plan, with fishing regulations in place and enforced, and sustainable fisheries management practices enforced.

Identification of CFIs based on three main criteria

The Project Appraisal Document stipulates (Annex 2: Detailed Project Description) that “*the CFIs will be selected during implementation phase, with the potential selection criteria based on (i) dependency on fisheries, (ii) proximity to the mainstream Mekong and the Sekong Rivers, (iii) the number of critical habitats fished by the community, and (iv) level of commitment to co-manage fish resources*”.

On these bases, the project team identified three main criteria for village selection: i) a *socioeconomic context* favourable to fishery management - including dependency on fisheries and gender criteria; ii) a *CFI governance context* reflecting a fair level of commitment to fishery co-management, and iii) an *environmental context* characterized by habitats important for fish resources.

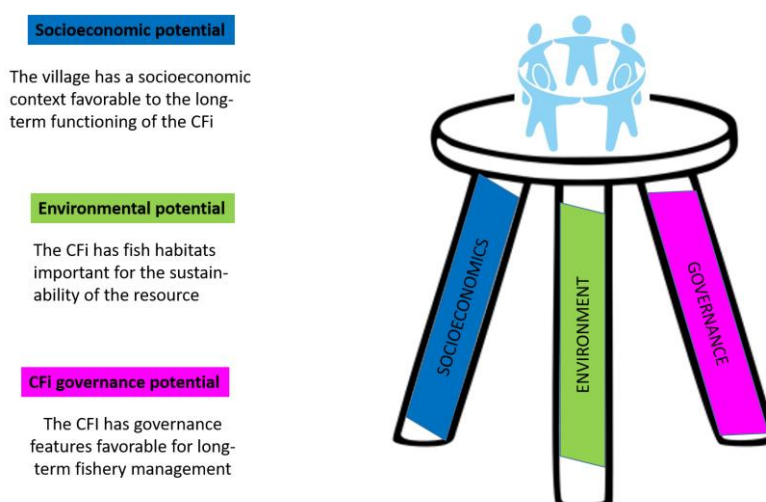


Figure 2: The three main criteria for CFI selection

Sub-Decree n° 25 on Community Fisheries Management and Prakas on Guidelines for Community Fisheries provide guidance and criteria for identifying and establishing a Community Fishery, but these criteria actually apply to villages willing to join the network of Community Fisheries. Here, the purpose of the selection is to identify and select community fisheries with the best potential to become fully functional and with high environmental value for resource protection.

The approach detailed below consists in identifying all the variables that allow assessing the potential of CFIs, giving a weight (or coefficient) to each variable, calculating the weighted average of each CFI for these variables, and ranking all CFIs based on their overall potential, for final selection.

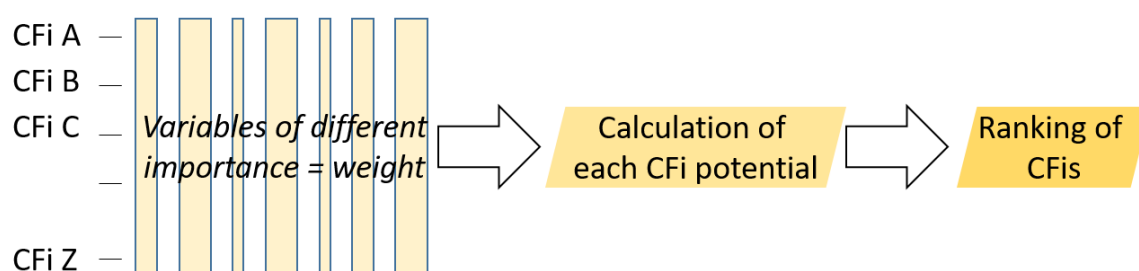


Figure 3: Principle of the CFI selection

An extensive and progressive process

The selection process described in the present manual actually spread over two years:

- i) definition of the selection process in the first half of 2017 (data gathering, identification of socioeconomic and governance variables used for selection, process for rating);
- ii) update of socioeconomic and governance data based on field-based consultations in January-March 2018, leading to the identification of 40 first CFIs for Year 1 and 2 support;
- iii) upgrade early 2019 of the process based on the World Bank's feedback, gathering of environmental data and integration of environmental variables for revised selection, finalization of the rating process and identification of all 70 CFI (present report, April 2019).

A consultative and transparent process

Consultations and transparency have been central to the process:

- Socioeconomic and governance variables proposed as criteria for selection are based on the variables available in national databases. The choice of variables reflects aspects considered significant to CFI functioning by the group of eight CFI experts gathered in May 2017 for that purpose.
- These variables, as well as those not selected, were further reviewed, discussed and amended on 03 July 2017 by the 17 members of the Sub-group on CFI of the Technical Working Group on Fisheries of the government. This group of line agencies, research organizations, NGOs and donors all involved in CFI management is the largest group of officially recognized CFI specialists in Cambodia.
- The proposed process, the variables considered, their respective weight and the final rating of individual CFIs for socioeconomic and governance variables were presented to partners in the provinces during two public consultations in January 2018. Participants included members of central FiA, provincial FiA Cantonments, the Department of Environment and local NGOs who support CFIs (CEPA, DPA, My Village, NRD and WWF). These partners validated or amended methodological choices, amended rating, and validated the overall selection process.
- In absence of environmental data about "critical habitats" at the level of individual CFIs, a consultation was organized in March 2019. This consultation brought together project team members from Phnom Penh and eight staff members from the provincial Cantonments, so that they can contribute their personal expertise of sites.
- The new sites willing to become CFIs were identified collectively during the January 2018 meetings that involved Cantonments, other line agencies and NGOs. These sites were later on presented in

detail by Cantonments heads during a March 2019 meeting. The prioritization of sites and final selection was done collectively during that latter meeting.

- Last, the final selection of CFi based on the process described in the present report was presented to Cantonments for information and final feedback before public release.

CFi selection: a seven-step process

This process described in the present report includes seven steps:

- review of quantitative information available in national databases;
- identification of variables relevant to the selection of CFis;
- gathering of missing environmental information;
- weighting of variables used for the selection of CFis;
- coding of data for each variable;
- data update based on consultation of provincial CFi experts;
- calculation of individual CFi potential.

These steps, detailed below, lead to the overall ranking and selection of CFis for project support.

3. SELECTION PROCESS

3.1. Review of quantitative information available

Data available described below correspond to the situation when the present review and selection process started, in April 2017.

Socioeconomic information about communes and villages

Two databases were available in 2017 to provide village-level information relevant to the CFi selection:

1. The 2015 NCDD Commune database.

This database is based on the 2015 national census 2015 and is produced by the National Committee for Sub-National Democratic Development (NCDD). The database provides data for 578 variables in the following categories:

Demography; Fertility and mortality; Education;
Employment; Average income per month; Consumptions; Poverty;
Housing; Sources of power supply; Source of clean water and sanitation;
Property; Agriculture land by household; Livestock and poultry;
Access to health care; Disability;
Crises or household disadvantages; Violence, security and order

These socioeconomic variables allow describing the village CFis are part of.

2. The 2016 Fishing dependency database

This database results from the work of Nasielski *et al.* (2013, 2016) and combines multiple data sources to produce, at the national level, a fishing dependency score by village. As detailed by Baran *et al.* (2014), “this score reflects the proportion of fishers in the population

and the poverty level of the commune. Data on the proportion of fishers in the population is taken from the 2008 National Census information on primary and secondary occupation. This number is complemented with the number of unaccounted fishers derived from the 2010 Commune Database quantifying fishing boats. The proportion of fishers in the population is then weighed by the Village Poverty Score produced for each village by the Ministry of Planning in 2006. This weighting reflects the fact that poorer communes are more dependent on natural resources, since they have fewer economic alternatives”.

Information about Community Fisheries

One reference database provided information about existing Community Fisheries:

3. The CFDD Community Fisheries database

The Community Fisheries Development Department (CFDD) of the Fisheries Administration holds a database of all Community Fisheries registered in the country. This database includes information about the CFI (GIS coordinates, administrative affiliation, name in Khmer and roman script, establishment date), status (registration stage, area, number of members), gender (female members) and governance (partners, conservation, meetings, patrolling). The initial identification of candidates Community Fisheries is based on the June 2016 version of the CFDD database: 66 CFIs in Kratie Province and 52 in Stung Treng Province.

3.2. Identification of variables relevant to the selection of CFIs

The methodology implemented is based on a characterization of CFIs by variables describing both the village and the CFI. As detailed in section 2, the choice of these variables reflects data available and aspects considered significant to CFI functioning by the group of eight CFI experts. These variables proposed -or not retained- were reviewed by the 17 members of the Sub-group on CFI of the Technical Working Group on Fisheries of the government.

3.2.1. Selection of socioeconomic variables

Among the socioeconomic databases detailed above, the team identified the following variables as being relevant to CFI selection:

Table 1: Socioeconomic variables and criteria used for CFI selection

Original variables in databases	Variables calculated	Corresponding criteria
Province, District, Commune, Village (Khmer and roman script); GIS code		
Number of families, of females, of males	Total number of people in the village	Village size
Number of illiterate men and women >15 y. old in the village	% of illiterate men and women >15 y. old in the village	Village education
Number of motorbikes	Ratio motorbikes to families in the village	Village wealth
Number of motor boats	Ratio motor boats to families in the village	
Number of families living in a thatched roof house	% of families living in a thatched roof house	
Number of police-reported cases in the village	Cases of problems per family in the village	Village conflict level
Number of female headed households in the village	% female headed households in the village	Gender in the village
Distance in km of village to nearest year-round road.	Distance of village to nearest year-round road	Village isolation
Fishing dependency per commune	Village fishing dependency score	Village fishing dependency

This corresponds to seven socioeconomic criteria for CFI selection.

3.2.2. Selection of CFI governance variables

In the FiA CFDD database of CFI, the team identified the following variables as being relevant to CFI selection:

Table 2: Community fisheries governance variables and criteria used for CFI selection

Original variables in database	Variables calculated	Corresponding criteria
Name (Khmer and roman script), location (Province, District, Commune, Village)		
May 2017 registration status	Unchanged	Registration status
Number of CFI members	% of CFI members / village pop.	Importance of CFI in the village
Number of CFI partners	Unchanged	CFI networking
Frequency of CFI committee meetings	Unchanged	CFI governance activity
Frequency of patrolling	Unchanged	CFI field activity
Surface area of the CFI (ha)	Number of members per hectare	Ratio members to size
CFI conservation area (ha)	Unchanged	Size of the CFI conservation area

This corresponds to seven governance criteria for CFI selection.

3.2.3. Selection of environmental variables

Given the lack of environmental data about “critical habitats” at the level of individual CFis, the project organized a consultation bringing together project team members and FiA Cantonments officers who have contributed to CFi development for more than a decade, and are very familiar with both the environment of these CFi, their fish resources and the migrations or distribution of the corresponding species.

A discussion about the criteria that could be at least qualitatively characterized led to considering the presence and extent of the following habitats:

- **floodplains**, because floodplains are fish breeding and feeding grounds in tropical systems, in particular for multiple Mekong species (Welcomme 1979, Copp 1989, Baird and Bounpheng Phylavanh 1999, Valbo-Jørgensen et al. 2001, Winemiller 2004)
- **permanent wetlands** (lakes, ponds, reservoirs, etc.) because they are refuges for floodplain fish during the dry season (Roggeri 1995, Hoggarth et al. 1999, Brooks and Sieu 2016)
- **deep pools** in the river, as these are important habitats and refuges for river fish during the dry season (Poulsen et al. 2002, Chan et al. 2005, Baran et al. 2005, Halls et al. 2013)
- **rapids** in the river, as these very oxygenated habitats are believed to be home of a particular fish fauna, in particular Cobitidae and other loaches (Bin Kang et al. 2009, Allen et al. 2012)
- **river wetlands** (islands, shallow areas, inundated riverine vegetation, etc.), as this diversity of habitats is beneficial to fish, their reproduction and their feeding (Roberts and Baird 1995, Baird 2001, Allen et al. 2008)

The presence of two additional environmental features in each CFi area was also considered:

- **fish breeding sites** (specific areas where adult fish come to breed or spawn);
- **fish nursery areas** (specific areas of concentration and growth of juvenile fish).

Both features have been identified and described in nearby Khone Falls and in the Mekong mainstream using local ecological knowledge (Roberts and Baird 1995, Baird et al. 1998, Valbo-Jørgensen et al. 1999, Poulsen and Valbo-Jørgensen 2000).

The presence of fish migration corridors were not included as a selection factor, since:

- the term “migration” covers a diversity of long-distance, short-distance, trophic, breeding, massive or individual patterns (Baran 2006), making this single term unclear;
- species involved vary from one to several dozens, but assessing their number requires a large-scale study involving numerous fishers over a large area (e.g. Poulsen and Valbo-Jørgensen 1999, Baran et al. 2015), which was not possible as part of this assessment;
- the migration routes or corridors can be assessed at the scale of a river, but not at the scale of a bank, a river channel or a local creek characterizing a given CFi.

Similarly, the presence or rare or endangered species was not retained, as there is no list of species at the CFi level.

Thus, seven environmental criteria were retained for CFi selection.

The summary of all variables considered for the selection is given in Figure 4; thi corresponds to 21 variables.

SOCIOECONOMIC POTENTIAL	CFi GOVERNANCE POTENTIAL	CFi ENVIRONMENTAL POTENTIAL
Total number of people in the village	Ratio CFI size /village size	Floodplains
% of illiterate men and women	Registration status	Permanent wetlands
Ratio motorbikes, boats and thatched roofs to families	Number of CFI partners	Deep pools
Conflict level	Frequency of CFI meetings	Rapids
% of female headed households	Frequency of patrolling	River wetlands
Village isolation	CFI members per hectare of CFI	Fish breeding sites
Fishing dependency	Size of the CFI conservation area	Fish nurseries
NATIONAL DATA	FIELD DATA	MAPS, EXPERTISE

Figure 4: Summary of the variables considered for each selection criterion

In the companion database (CFi RATING & RANKING, WB project, ST & KT, March 2019.xlsx), the original commune, CFDD and fish dependency data per CFI are provided in sheets:

1. 2016 CFDD data	2. 2015 Commune data	3. 2016 Fish dependency data
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3.3. Gathering of missing environmental information

Project documents such as the Project Appraisal Document briefly characterize “critical habitats” as spawning, feeding and refuge habitats, but:

- the notion of “critical aquatic habitats” remains elusive, with possible debates about the preferred perspective (biodiversity conservation areas with presence of rare species, productive areas important for fish harvesting, breeding areas critical for stock sustainability, etc.) and about how critical a given habitat is (threshold issue).
- remote sensing allows mapping visible habitats based on land cover, but not underwater habitats (e.g. deep pools in the river bed) nor the use of these habitats by fish (i.e. no mapping of migration corridors, feeding or breeding grounds at the local level).
- critical habitats already identified (e.g. the Ramsar site in Stung Treng; Allen et al. 2008) have been established based on microhabitat diversity and overall species richness including birds, insects or amphibians. Furthermore, the scale of that mapping corresponds to an overall biodiversity conservation perspective and is much broader than that of individual CFIs.

3.4. Weighting of variables used for selection of CFI

Given the need for a simple and transparent procedure, a simple system of weights or coefficients was used for each variable:

- weight “1”, corresponding to “low importance”;
- weight “2”, corresponding to “medium importance”
- weight “3”, corresponding to “high importance”.

For instance, the weight of “Frequency of patrolling” is “3” because this factor is considered as a very clear indicator of CFI effectiveness. The weight of “Village wealth” is “1” because this factor is considered influential (CFIs in wealthy villages perform better) but of lower importance overall.

Weighting of criteria = coefficient

All criteria do not have the same importance

1 = low importance;

2 = medium importance;

3 = high importance

1	2	3
Rapids	River wetlands	Fish breeding sites

Figure 6: Illustration of weights in the case of environmental variables

We present in Table 3 the weighting of all variables used for the selection.

The weight of variables was checked and validated by several panels of reviewers, in particular members of the Sub-group on Community Fisheries of the Technical Working Group on Fisheries in the Fisheries Administration, but also FiA specialists and project partners in Stung Treng (provincial FiA, Department of Environment, and local NGOs supporting CFI, such as CEPA, DPA and My Village), and in Kratie (provincial FiA and local NGOs such as NRD and WWF).

Table 3: Descriptors reviewed for selection and the weight they are attributed (from 1: low importance, to 3: high importance)

Criteria	Variable	Weight	Reason
Socioeconomic potential	Total number of people in the village	2	Village size plays a significant role in CFI effectiveness
	% of illiterate men and women	2	Education level in the village plays a significant role in CFI functioning
	Ratio motorbikes, boats and thatched roofs to families	1	Wealth of the village <i>influences</i> CFI functioning
	Conflict level	3	Existence of major conflicts in villages (murder, land grabbing, domestic violence) seriously hampers CFI functioning
	% female headed households in the village	2	Due to gender-related constraints, the proportion of women in villages plays a significant role in CFI effectiveness
	Village isolation	2	Village isolation (lack of exchange, information deficit, etc.) hampers CFI effectiveness
	Fishing dependency	3	Level of fishing dependency in a village is a crucial motivation for CFI development and also for selection of a CFI by the project
CFI governance potential	Ration CFI size / village size	2	A high proportion of CFI members in the village reflects good endorsement of the CFI and likelihood of good functioning
	Registration status of the CFI	2	CFI registration status reflects CFI functioning
	Number of CFI partners (2017)	3	The number of external partners (NGOs, donors) helping with CFI management definitely influences CFI effectiveness
	Frequency of CFI meetings	2	Frequency of CFI meetings reflects CFI functioning
	Frequency of patrolling	3	Frequency of patrolling is a very clear indicator of CFI effectiveness
	CFI members per hectare of CFI	3	The number of CFI members per hectare of CFI is a very significant indicator of CFI effectiveness
	CFI conservation area size (ha)	3	Presence of and size of the conservation zone is a very significant indicator of CFI effectiveness
CFI environmental potential	Floodplains	3	Floodplains are essential to fishery productivity
	Permanent wetlands	3	Permanent wetlands are essential to black fish and to dry season fish production
	Deep pools	3	Deep pools are refuges and see a concentration of breeders
	Rapids	1	Rapids feature a specific biodiversity but are not so common and are also an obstacle to fish migrations and movements
	River wetlands	2	River wetlands are important for local biodiversity
	Fish breeding sites	3	Fish breeding sites are essential and limited a particular areas
	Fish nurseries	2	Fish nurseries are important like breeding sites (complementary) but more extensive, more widely distributed

3.5. Coding of data for each variable

Given the diversity of variables, of their units, and of their nature either quantitative or semi-qualitative, it was not possible to combine them arithmetically. Like for variable weights, a simple method based on coding was used for the standardization of data: CFIs were classified into three tiers for each variable (from the lowest to the highest value), and the actual data value for that variable is replaced with a code:

- 1 = low value = lowest tier = potential not so good
- 2 = medium value = middle tier = potential OK
- 3 = high value = upper tier = good potential

For instance, data available about the level of conflicts in the village (% of problems recorded per family) are converted into 3 codes splitting the group of all CFIs into three tiers: code 3 when the level of social problems is low (first tier), code 2 when the level of social problems is medium (second tier), and code 1 when the level of social problems is high (bottom tier).

Coding data

- 1 = lowest 33% = potential not so good;
- 2 = middle range = potential OK;
- 3 = top 33% = good potential

CFI Name (in roman script)	Floodplain presence
Ampil Teuk	1
Anlong Preah Kou	3
B'ier	2

Figure 7: Illustration of coding of variables in the case of environmental variables

Table 4: Descriptors of villages and CFi, coding, and justifications

Criteria	Variables	Coding
Socio-economic potential	Total number of people in the village	CFi membership, endorsement and influence are low in large villages → code = 1 CFi membership, endorsement and influence are adequate in small villages → code = 2 CFi membership, endorsement and influence are highest in medium size villages → code = 3
	% of illiterate men and women	Villages with a high illiteracy rate perform poorly in terms of CFi functioning and effectiveness → code = 1 Villages with a medium illiteracy rate perform best in CFis → code = 3 Villages with a low illiteracy rate have more options and do not do CFis → code = 2
	Village wealth (ratio motorbikes to families)	A wealthy village (high ratio of bikes per family) has more opportunities to operate a CFi and more livelihood alternatives → code=3 A moderately wealthy village can still adequately operate a CFi → code = 2 A poor village has few opportunities and more constraints to operate a CFi, and less livelihood alternatives → code = 1
	Village wealth (ratio motor boats to families)	A wealthy village (high ratio of boats per family) has more opportunities to operate a CFi and more livelihood alternatives → code=3 A moderately wealthy village can still adequately operate a CFi → code = 2 A poor village has few opportunities and more constraints to operate a CFi, and less livelihood alternatives → code = 1
	% of families living in a thatched roof house	A wealthy village (low ratio of families under thatched roofs) has more opportunities to operate a CFi and more livelihood alternatives → code = 3 A moderately wealthy village can still adequately operate a CFi → code = 2 A poor village has few opportunities and more constraints to operate a CFi, and less livelihood alternatives → code = 1
	% cases of problems per family in the village	Villages with a low rate of conflicts perform best in terms of CFi functioning and effectiveness → code = 3 Villages with a medium rate of conflicts perform adequately in terms of CFi functioning and effectiveness → code = 2 Villages with a high rate of conflicts perform poorly in terms of CFi functioning and effectiveness → code = 1
	% female headed households in the village	Due to gender-related constraints, a high proportion of female headed households in villages makes CFi less operational and effective → code = 1 A low proportion of female headed households in villages makes CFis male-biased → code = 2 A medium proportion of female headed households in villages allows including women in effective and operational CFi → code = 3
	Distance of village to nearest year-round road	A very isolated village cannot benefit from interactions with other CFi and cantonment → code = 1 A village moderately isolated can benefit from some interactions with other CFi and cantonment → code = 2 A village that is not isolated can benefit from interactions with other CFi and cantonment → code = 3
	Final fishing dependency score after poverty adjustment in village	A village with high fishing dependency does need a good CFi and is a priority target for the project → code = 3 A village with a medium fishing dependency may need a CFi and be considered for project intervention → code = 2 A village with low fishing dependency may not need a CFi and is not a priority target for the project → code = 1

Table 6 (continued)

Criteria	Variables	Coding
CFi governance potential	% of CFI members / village population	A high proportion of CFI members in the village population indicates a very positive endorsement of the CFI → code = 3 A medium proportion of CFI members in the village population indicates some endorsement of the CFI → code = 2 A low proportion of CFI members in the village population indicates a low endorsement of the CFI → code = 1
	May 2017 registration status of CFI (stage 1 to 9)	Village having completed stages 8 or 9 of registration are well advanced for CFI operation and effectiveness → code = 3 Village having completed stages 5 to 7 of registration are getting prepared for CFI operation and effectiveness → code = 2 Village having completed stages 1 to 4 of CFI registration are not yet operational and effective → code = 1
	Number of CFI partners (2017)	Villages with a high number of assisting partners are best positioned in terms of CFI operation and effectiveness → code = 3 Villages with a medium number of partners are second best positioned in terms of CFI operation and effectiveness → code = 2 Villages with a low number of partners or none are not well positioned in terms of CFI operation and effectiveness → code = 1
	Frequency of CFI committee meetings	A high frequency of CFI meetings indicates active CFI functioning → code = 3 A medium frequency of CFI meetings indicates an adequate functioning → code = 2 A low frequency of CFI meetings indicates low to now activity of the CFI → code = 1
	Frequency of patrolling	CFIs with frequent patrolling reflect active CFI operation and effectiveness → code = 3 CFIs with a medium frequency of patrolling perform adequately → code = 2 CFIs with a low frequency of patrolling or no patrolling do not perform adequately → code = 1
	Total number of CFI members per hectare of CFI	A high number of CFI members per ha allows ensuring activities over the whole CFI area → code = 3 A medium number of CFI members per ha may not always ensure enough coverage of the CFI → code = 2 A low number of CFI members per ha does not allow properly covering the CFI area → code = 1
	CFi conservation area (ha)	A large surface area of conservation zone makes the CFI more effective → code = 3 A medium surface area of conservation zone makes the CFI adequately effective → code = 2 A small surface area of conservation zone or none makes the CFI less effective → code = 1

Table 6 (continued)

Criteria	Variables	Coding
Environmental potential	Floodplains	Large floodplains are very beneficial to fish diversity and production → code = 3 Limited floodplains have a low contribution to fish diversity and production → code = 2 Absence of floodplains does not benefit fish diversity and production → code = 1
	Permanent wetlands	Large permanent wetlands are very beneficial as dry season refuges → code = 3 Limited permanent wetlands have a low contribution to fish protection → code = 2 Absence of permanent wetlands does not benefit fish → code = 1
	Deep pools	Large and deep pools act as refuges in dry season and for large breeders → code = 3 Limited presence of deep pools has limited benefits to dry season fish and breeders → code = 2 Absence of deep pools does not benefit fish diversity and production → code = 1
	Rapids	Extensive rapids are beneficial to fish biodiversity → code = 3 Limited extent of rapids has limited benefit to fish biodiversity → code = 2 Absence of river rapids has no benefit to fish diversity → code = 1
	River wetlands	Extensive river wetlands are beneficial to fish biodiversity → code = 3 Limited extent of river wetlands has limited benefit to fish biodiversity → code = 2 Absence of river wetlands has no benefit to fish diversity → code = 1
	Breeding sites	Presence of extensive breeding sites is essential to the protection and sustainability of fish resources → code = 3 Limited extent of breeding sites is useful to the protection and sustainability of fish resources → code = 2 Absence of breeding sites does not contribute to protection and sustainability of fish resources → code = 1
	Fish nurseries	Presence of fish nursery sites is essential to the protection and sustainability of fish resources → code = 3 Limited extent of fish nursery sites is useful to the protection and sustainability of fish resources → code = 2 Absence of fish nursery sites does not contribute to protection and sustainability of fish resources → code = 1

3.6. Data update based on consultations

As mentioned in Section 2, the original data per village and CFI were updated, after coding, during two consultations. The two consultative meetings were organized on January 9th and 10th 2018 in Stung Treng and Kratie Provinces respectively. In Stung Treng Province, the meeting was conducted at the office of Department of Agriculture, Forestry and Fisheries with 15 participants representing central FiA, provincial FiA Cantonment, the Department of Environment, and local NGOs who support CFIs in Stung Treng (CEPA, DPA and My Village). In Kratie Province, the meeting was conducted in the office provincial fisheries administration of Kratie with 15 participants representing local NGOs who support CFIs in Kratie (NRD and WWF), provincial FiA Cantonment and central FiA.

The review was done for all community fisheries of both provinces. When raw data for some of the variables in some CFI could not be updated, the reviewers provided instead a *code* corresponding to the position of the CFI in the superior, medium or inferior tier of the overall distribution for that variable (code based on the estimate of the meeting participants familiar with that CFI, by comparison with the other CFIs). Then all data were coded using the 1/2/3 coding system described in section 3.5. Last, the project team conducted a final meeting in Phnom Penh to review data collected during province consultation, and validate the final data sheet.

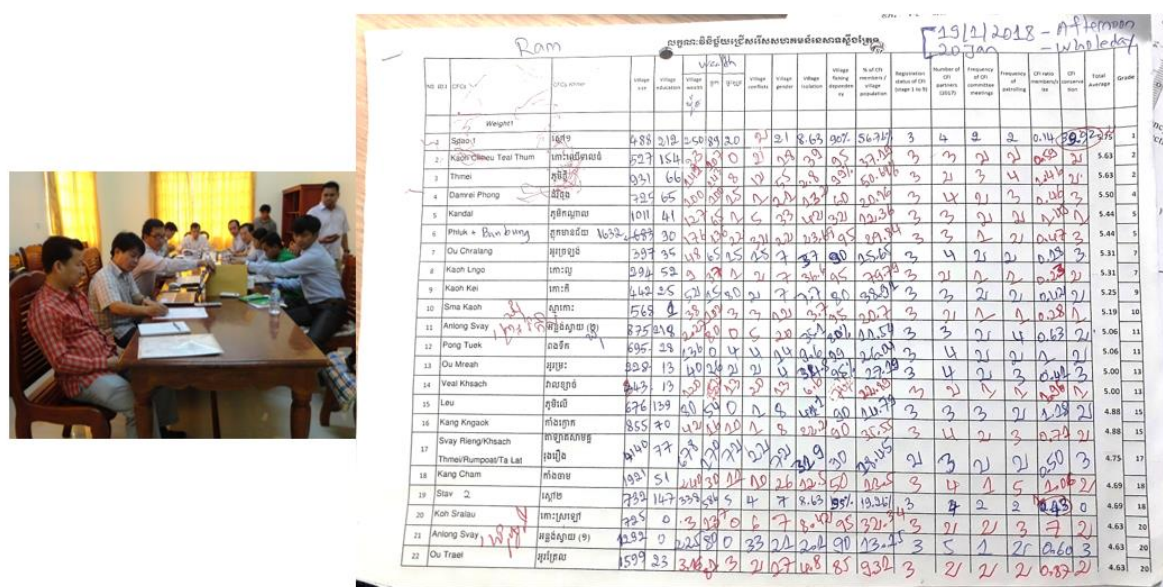


Figure 8: One of the update meetings and a sample sheet of updated data for CFIs.

In the companion database (CFI RATING & RANKING, WB project, ST & KT, March 2019.xlsx), the coded (= rating) data per CFI are provided in sheet:

7. 2018-2019 rating update

Note: the January 2018 consultative data update of all CFIs was originally followed by an identification of 60 “top CFIs” that were visited for further data updating with the CFI members themselves. However, as this additional step in the process was limited to a fraction of all communities, the second update was not kept for the present analysis and selection.

Absence of information for 4 CFi and CFi

The analysis of available data, confirmed by the consultations, revealed that no socioeconomic information is available for four communes and CFis in Kratie Province; these correspond to very specific situations: S'at, Bay Samnom, Svay Cheak and Trapeang Srae.

In Stung Treng Province, some records document Sraekor mouy, a former CFi of a village now flooded under the Lower Sesan 2 Dam reservoir.

None of these 5 CFis was kept for the selection, the final number of CFis being then reduced from 118 to 113.

Table 5: Community Fisheries listed in the FiA database but not kept for selection

Province	CFi (Khmer)	CFi (roman)	2017 national databases	Decision made
Kratie	បាយសំណុំ	Bay Samnom	No data	CFi not kept
Kratie	ស្វាយចេក	Svay Cheak	No data	CFi not kept
Kratie	ត្រពាំងស្រែក្នុង	Trapeang Srae	No data	CFi not kept
Kratie	ស្ថាត	S'at	No data	CFi not kept
Stung Treng	ស្រែករមានជ័យ	Sre kormeanchey = Srae Ko 1 = Sraekor mouy		Flooded under Lower Sesan 2 reservoir. CFi not kept

3.7. Calculation of individual CFi potential

For each CFi and each variable, the weight of the variable is multiplied by the code of the variable reflecting the potential of the CFi. Then the overall sum is divided by the sum of all weights, the result being the score of that CFi. The process corresponds to a weighted average.

Practically, the calculation is:

$$\text{CFi potential} = \text{CFi overall score} = [(\text{Score of CFi for Variable 1} \times \text{Weight of Variable 1}) + (\text{Score of CFi for Variable 2} \times \text{Weight of Variable 2}) + \dots + (\text{Score of CFi for Variable n} \times \text{Weight of Variable n})] / [\text{Sum of all weights}]$$

In the companion database, the calculation of CFis potentials and overall rating is detailed in sheet:

8. Potential calculation

CFI ENVIRONMENTAL POTENTIAL								
Weight	3	3	3	1	2	3	2	SUM=17
CFi Name (in roman script)	Floodplain presence	Permanent wetlands	Deep pools	Rapids	River wetlands	Fish breeding sites	Fish nurseries	Environmental potential
Ampil Teuk	1	1	3	1	3	3	2	2.06
Anlong Preah Kou	3	1	2	1	3	3	3	2.35
B'ier	2	2	1	1	3	1	1	1.59

$$1 \times 3 + 1 \times 3 + 3 \times 3 + 1 \times 1 + 3 \times 2 + 3 \times 3 + 2 \times 2 = 35$$

$$35 / 17 = 2.06$$

Figure 9: Illustration of the calculation of a CFi score (in red) for one CFi (Ampil Teuk) and one criterion (environmental potential)

The same process is made for each of the three socioeconomic, governance and environmental criteria, leading to 3 series of potential scores. These 3 scores are then summed into an overall score representing the overall potential of a given CFi to become a fully functional CFi in an environmental context characterized by habitats important for fish resources. CFis having the highest potential are selected after these scores are ranked from the highest to the lowest (Figure 10).

Province	Name of CFi (in Khmer)	CFi Name (in roman script)	Socioeconomic potential	Governance potential	Environmental potential	GRAND TOTAL
Kracheh	ព្រែកក្រឹង	Prek Krieng	2.64	2.39	2.82	7.86
Kracheh	កោះខ្មែរ	Koh Khnhaer	2.67	2.56	2.29	7.52
Stung Treng	ស្ទឹង	Sdau 1	2.56	2.11	2.82	7.49
Kracheh	ទំនប់ប៉ាក	Tomnub Pak	2.31	2.33	2.65	7.29
Stung Treng	ភូមិកណ្តាល	Phum Kandal	2.49	2.11	2.65	7.25
Stung Treng	អូរច្រឡឹង	Ou Chralang	2.42	2.33	2.47	7.23
Kracheh	អន្លង់ព្រះកោ	Anlong Preah Kou	2.29	2.56	2.35	7.20
Stung Treng	ភូមិលើ	Phum Leu	2.29	2.22	2.65	7.16
Stung Treng	ស្ទឹង	Sdau 2	2.27	2.06	2.82	7.15

SUM large ↓ small

Figure 10: calculation of the overall score for CFi selection

In the companion database, the summary of CFis socioeconomic, governance and environmental potential rating is detailed in sheet:

9. Summary

4. RESULTS

Of all CFIs reviewed in Kratie and Stung Treng Province, sixty-four have been identified for project support. They are complemented with 6 sites willing to become new CFIs, bringing the total of supported sites to 70.

These 64 community fisheries include 54 CFIs with the maximal combined socioeconomic, governance and environmental potential, and 10 additional CFIs located around the median of the ranking table¹. The purpose of including CFIs around the median is to reflect a requirement to also include average-performance CFIs, so that the assistance from the project is likely to produce more benefits than with CFIs whose potential and governance performance are already high. The number of middle-performance CFIs was limited to 10 in order not to include multiple sites whose environmental potential is mediocre.

We detail below the 64 sites selected. In total, when the 6 new sites are also included (see section 5), 35 sites are selected in each province (Kratie: 31 selected CFIs + 4 new sites = 35; Stung Treng: 33 selected CFIs + 2 new sites = 35).

Table 6: Community fisheries selected for project support

Province	Name of CFI (in Khmer)	CFI Name (in roman script)	Rank
Kracheh	ព្រែកក្រៀង	Prek Krieng	1
Kracheh	កោះខ្ពែរ	Koh Khnhaer	2
Stung Treng	ស្តៅ១	Sdau 1	3
Kracheh	ទំនប់ប៉ាក់	Tomnub Pak	4
Stung Treng	ភូមិកណ្តាល	Phum Kandal	5
Stung Treng	អូរច្រឡឹង	Ou Chralang	6
Kracheh	អន្លង់ព្រះគោ	Anlong Preah Kou	7
Stung Treng	ភូមិលើ	Phum Leu	8
Stung Treng	ស្តៅ២	Sdau 2	9
Stung Treng	កោះកី	Koh Keuy	10
Kracheh	កាំពី	Kampi	11
Stung Treng	ភូមិថ្មី	Phum Thmei	12
Kracheh	វាល្អាន	Voadthonak	13
Kracheh	ពន្លឺជា	Pon Chea	14
Stung Treng	កោះកន្ទាយ	Koh Kantheay	15
Stung Treng	ភូមិមានជ័យ	Phloulk Meanchey	16
Stung Treng	ដំរីផ្អែង	Damrey Phong	17
Stung Treng	អន្លង់ស្វាយ (២)	Anlong Svay 2	18
Kracheh	កោះច្បារ	Koh Chbar	19
Kratie	អូរលុង	Ou Lung	20
Kratie	ខ្សាច់លាវ	Khsach Leav	21

¹ In a table of 113 CFIs, the median is at rank 57: 56 CFIs have a higher rank, 56 CFIs have a lower rank.

Province	Name of CFI (in Khmer)	CFI Name (in roman script)	Rank
Stung Treng	កោះឈើទាលធំ	Koh Chheu Teal Thom	22
Kratie	បួស្មីកែវ	Russey Keo	23
Stung Treng	វាលខ្សាច់	Veal Khsach	24
Kratie	តាម៉ៅ	Ta Mau	25
Stung Treng	ក្រឡាពាស	Krala Peas	26
Kratie	កំពង់ក្របី	Kampong Krabei	27
Kratie	ព្រែកតាម៉ឹង	Prek Ta Theung	28
Kratie	តាងួន	Ta Nguon	29
Stung Treng	អូរម្រះ	Ou Mreah	30
Kratie	កំពង់ក្បឿង	Kampong Kbeong	31
Kratie	អូរក្រសាំង	Ou Krasaang	32
Stung Treng	ជួរតាម៉ៅ	Chur Tameo	33
Stung Treng	ភូមិក្រោម	Phum Kraom	34
Stung Treng	កោះស្នែង	Koh Sneng	35
Kratie	តាកៈខ្លាសុះ	Takikhlastus	36
Kratie	ទ្រូងឈ្មាំង	Tranoul Chhnang	37
Stung Treng	ថ្មតាគុក	Thmar Takuk	38
Stung Treng	កោះស្រឡៅ	Koh Sralau	39
Kratie	អំពិលទឹក	Ampil Teuk	40
Stung Treng	កោះពោធិ	Koh Pnov	41
Stung Treng	កោះជ្រើម	Koh Chruem	42
Kratie	ព្រែកតាអាំ	Prek Ta Am	43
Stung Treng	វ៉ែនសៀន	Veun Sien	45
Stung Treng	អន្លង់កោះកាង	Anlong Koh Kang	44
Kratie	កំពង់រទេះ	Kampong Roteh	46
Stung Treng	កោះឈើទាលតូច	Koh Chheu Teal Touch	47
Stung Treng	កាំងក្បោក	Kang Kngaok	48
Stung Treng	អន្លង់ថ្មបាំង	Anglong Thmar Bang	49
Kratie	កញ្ជ័រ	Kanh Chor	50
Kratie	សោបលើ	Saob Leu	51
Kratie	តំរើ	Damrae	52
Kratie	ព្រែកសាម៉ាន់	Prek Saman	53
Stung Treng	ពងទឹក	Pong Tuek	54
Stung Treng	តាឡាតសាមគីរុងរៀង	Talat Samki Rungreung	55
Kratie	កោះសក្តិសិទ្ធិ (កោះផ្តៅ)	Kohsaksit (Koh Phdau)	56
Stung Treng	អន្លង់ស្វាយ (១)	Anlong Svay 1	57
Kratie	វាលខ្សៀង	Veal Kyong	58
Kratie	កោះសំ	Koh Sam	59
Stung Treng	កោះសំពាយ	Koh Sampeay	60

Province	Name of CFI (in Khmer)	CFI Name (in roman script)	Rank
Kratie	កោះដំបង	Koh Dambang	61
Stung Treng	កាំងចាម	Kang Cham	62
Stung Treng	កោះព្រះ	Koh Pras	63
Kratie	សំបូក	Sambok	64

Note: In Stung Treng Province, 4 CFI selected are located in Stung Treng Ramsar site. These are Koh Sralau, Krala Peas, Thmei and Veal Khsach.

Thus, **in Kratie** the Community Fisheries selected are:

Ampil Teuk; Anlong Preah Kou; Damrae; Kampi; Kampong Kbeong; Kampong Krabei; Kampong Roteh; Kanh Chor; Khsach Leav; Koh Chbar; Koh Dambang; Koh Khnhaer; Koh Sam; Kohsaksit (Koh Phdau); Ou Krasaang; Ou Lung; Pon Chea; Prek Krieng; Prek Saman; Prek Ta Am; Prek Ta Theung; Russey Keo; Sambok; Saob Leu; Ta Mau; Ta Nguon; Takikhlastus; Tomnub Pak; Tranoul Chhnang; Veal Kyong and Voadthonak.

In Stung Treng, the Community Fisheries selected are:

Anglong Thmar Bang; Anlong Koh Kang; Anlong Svay 1; Anlong Svay 2; Chur Tameo; Damrey Phong; Kang Cham; Kang Kngaok; Koh Chheu Teal Thom; Koh Chheu Teal Touch; Koh Chruem; Koh Kantheay; Koh Keuy; Koh Pnov; Koh Pras; Koh Sampeay; Koh Sneng; Koh Sralau; Krala Peas; Ou Chralang; Ou Mreah; Phloulk Meanchey; Phum Kandal; Phum Kraom; Phum Leu; Phum Thmei; Pong Tuek; Sdau 1; Sdau 2; Talat Samki Rungreung; Thmar Takuk; Veal Khsach and Veun Sien.

The CFIs *NOT SELECTED* for project support in each province are:

Kratie:

B'ier; Bay Samnom; Beung Kas; Beung Mlich / Anlong Vien; Beung Run; Chambak; Cheang Pheat; Damrey Phong; Dontrey; Han Chey; Kampong Kor; Keng Kampong Dor; Khsem; Kraham Koubak; Krakor; Krang Yeaymao; Ksach Tub; Ksachsway Brembre; Laet; Phum Thmei; Prek Chik; Prek Prang ; Prek Prolung; Prek Roka; Rokar Kandal; S'at; Sandan; Sre Sdao; Srea Thmei; Svay Cheak; Svay Chrum; Thma Reab; Tomnub Ochor; Tomnub Ou Kantout; Trapeang Srae.

Stung Treng:

Kampong Pang; Kang Daek; Koh Hib; Koh Krouch; Koh Lngo; Ou Lang; Ou Rai; Ou Run; Ou Svay; Ou Trael; Phchul; Samros chantha ban; Siem Bouk; Sma Kaoh; Sre Krasang; Svay; Tboung Khla; Tonsang.

Tables in the Annex detail the potential of each CFI selected for each of the 3 criteria in each province.

Note: the integration of environmental criteria in 2019 for the selection of 70 CFIs did not compromise the preliminary selection of 40 CFIs identified in 2018 based on socioeconomic and governance criteria only: all the 40 CFIs initially identified remain in the final list. This is explained by the fact that the initial 40 CFIs already featured strong governance made possible by good socioeconomic conditions and actually motivated by the presence of important and productive fish habitats (positive correlation of the three factors).

5. NEW SITES IDENTIFIED TO BECOME COMMUNITY FISHERIES

Since 2018 consultations, FiA Cantonments in Kratie and Stung Treng Provinces as well as local NGOs have identified new sites where local communities wish to create a Community Fishery and initiate the CFi registration process. Four sites were identified in Kratie, and two in Stung Treng.

In both cases the limited number of new candidate sites is due to the fact that almost all fish-dependent villages located near rivers or water bodies have already created a CFi.

In Kratie, sites candidates to become a new CFi are:

Sambo district

Boeng Char Commune	Koh Entrchey village
Ou Krieng Commune	Ou kok village,
Sambo Commune	Char Thnaol village
	Samraong village

The reasons for integrating **Koh Entrchey** to the project are:

- Commitment: strong request from the village community to form a CFi;
- Good natural environment: rapids, flooded forest, close to a dolphin pool;
- Conservation reasons: the village is already part of a Fishery Biodiversity Conservation Zone defined by MAFF and a Dolphin Conservation Zone defined by sub-decree
- Favorable social environment: villages around have already formed a CFi on the other bank;
- Need to protect the resource: outside fishers come to fish locally, creating conflicts and overfishing;
- Assistance to ethnic minorities: presence of indigenous people (Kuyi) in the village;

The reasons for integrating **Ou Kok** to the project are:

- Commitment: strong request from the village community to form a CFi;
- Good natural environment: presence of deep pools, rapids and flooded forest in the river;
- Conservation reasons: the village is already part of a Fishery Biodiversity Conservation Zone defined by MAFF and a Dolphin Conservation Zone defined by sub-decree
- Favorable social environment: villages around have already formed a CFi;
- Need to protect the resource: outside fishers come to fish locally, creating conflicts;
- Assistance to ethnic minorities: most villagers are indigenous people (Phnong and Kuyi);

The reasons for integrating **Samraong** to the project are:

- Commitment: strong request from the village community to form a CFi;
- Good natural environment: presence of rapids downstream and of forest long the bank; presence of a large permanent wetland;
- Conservation reasons: the village is already part of a Dolphin Conservation Zone defined by sub-decree
- Need to protect the resource: outside fishers come to fish locally, creating conflicts;
- Protection gap: other CFis are distant on this bank.

The reasons for integrating **Char Thnaol** to the project are:

- Commitment: strong request from the village community and local authorities to form a CFI;
- Good natural environment: presence of rapids downstream and of forest long the bank;
- presence of a tributary used for fish migrations;
- Conservation reasons: the village is already part of a Dolphin Conservation Zone;
- Need to protect the resource: outside fishers come to fish locally, creating conflicts;
- Protection gap: other CFI are distant on this bank;

In Stung Treng, the two sites candidates to become a new CFI are:

- Sesan District
 - Samkouy Commune, **Sre Tapang village**
- Stung Treng town
 - Prash Bat commune, **Kang Dei Sa village**

The reasons for integrating **Sre Tapang** to the project are:

- Commitment: strong request from the village community to form a CFI;
- Good natural environment: location on the Sekong River used for fish migrations; presence of river wetlands;
- Need to protect the resource: outside fishers come to fish locally, creating conflicts;
- Assistance to ethnic minorities: presence of indigenous people in the village.

The reasons for integrating **Kang Dei Sa** to the project are:

- Commitment: strong request from the village community to form a CFI;
- Good natural environment: diversity of underwater habitats, from shallow to deep;
- Favorable social environment: villages around have already formed a CFI;
- Assistance to ethnic minorities: presence of indigenous people in the village.

When these proposed sites are integrated, the final list of 70 selected CFIs and new sites is:

In Kratie (35 sites):

Ampil Teuk; Anlong Preah Kou; *Char Thnaol (new site)*; Damrae; Kampi; Kampong Kbeong; Kampong Krabei; Kampong Roteh; Kanh Chor; Khsach Leav; Koh Chbar; *Koh Dambang (medium performance)*; *Koh Entrchey (new site)*; Koh Khnhaer; *Koh Sam (medium performance)*; *Kohsaksit / Koh Phdau (medium performance)*; Ou Krasaang; *Ou Kok (new site)*; Ou Lung; Pon Chea; Prek Krieng; Prek Saman; Prek Ta Am; Prek Ta Theung; Russey Keo; *Sambok (medium performance)*; *Samraong (new site)*; Saob Leu; Ta Mau; Ta Nguon; Takikhlastus; Tomnub Pak; Tranoul Chhnang; *Veal Kyong (medium performance)* and Voadthonak.

In Stung Treng (35 sites):

Anglong Thmar Bang; Anlong Koh Kang; *Anlong Svay 1 (medium performance)*; Anlong Svay 2; Chur Tameo; Damrey Phong; Kang Cham (*medium performance*); *Kang Dei Sa (new site)*; Kang Kngaok; Koh Chheu Teal Thom; Koh Chheu Teal Touch; Koh Chruem; Koh Kantheay; Koh Keuy; Koh Pnov; *Koh Pras (medium performance)*; *Koh Sampeay (medium performance)*; Koh Sneng; Koh Sralau; Krala Peas; Ou Chralang; Ou Mreah; Phloulk Meanchey; Phum Kandal; Phum Kraom; Phum Leu; Phum Thmei; Pong Tuek; Sdau 1; Sdau 2; *Sre Tapang (new site)*; Talat Samki Rungreung (*medium performance*); Thmar Takuk; Veal Khsach and Veun Sien.

6. MAPPING OF RESULTS

Figure 11 shows the distribution of all CFis and of CFi selected. All CFi selected for funding are located along the mainstream and on Sekong and Sesan Rivers.

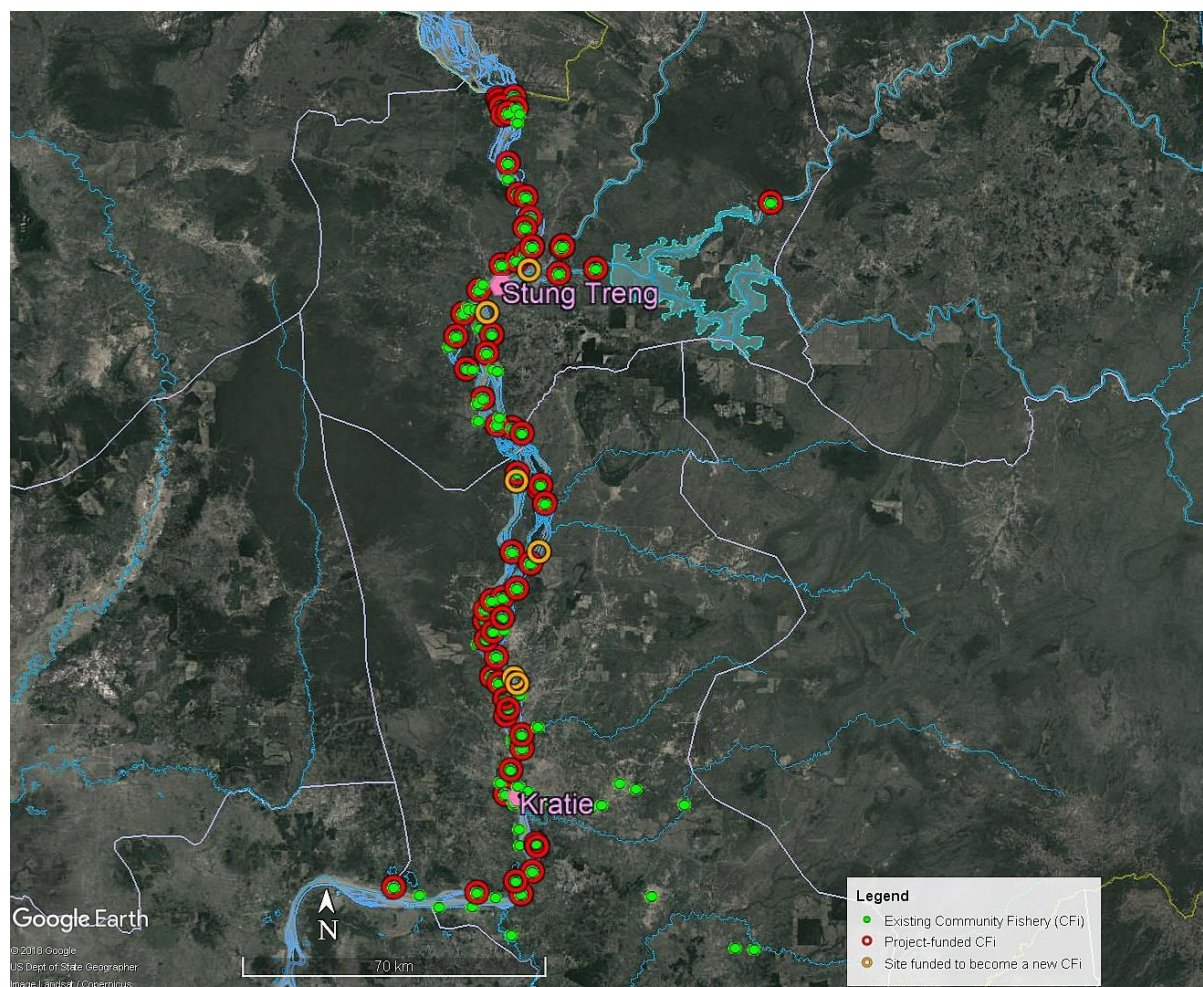


Figure 11: Distribution of Community Fisheries in Kratie and Stung Treng provinces (green dots) and of selected CFis (red circles)

Figure 12 shows the community fisheries and new sites selected in Stung Treng Province. There is a concentration of selected CFis in the islands and river wetlands near the border, just downstream of Don Sahong Dam in Lao PDR.

Figure 13 shows the community fisheries and new sites selected in Kratie Province. There is a concentration of selected CFis in the islands and river wetlands upstream of Kratie, in Sambor District.

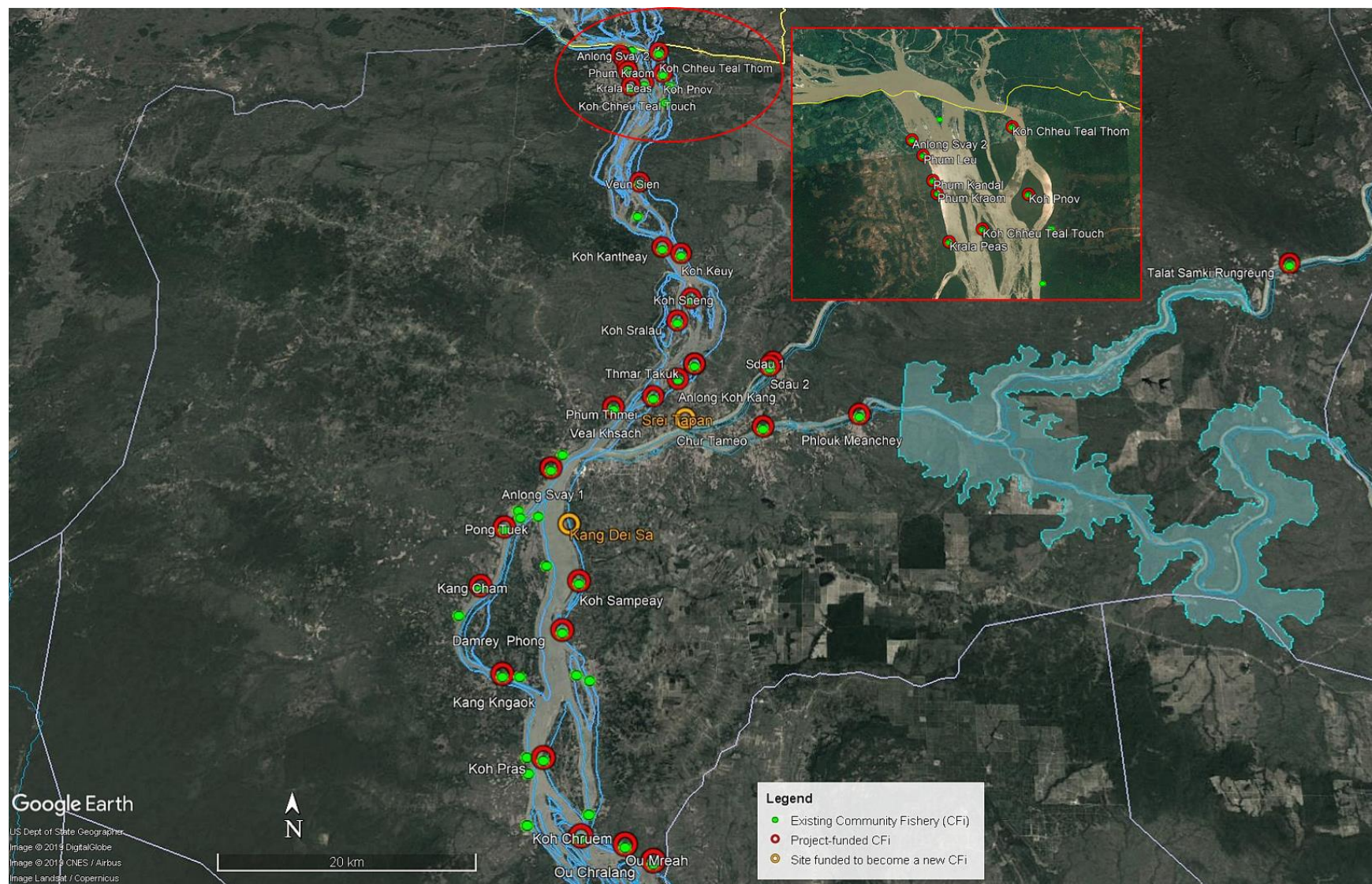


Figure 12: Community Fisheries and new sites selected in Stung Treng Province

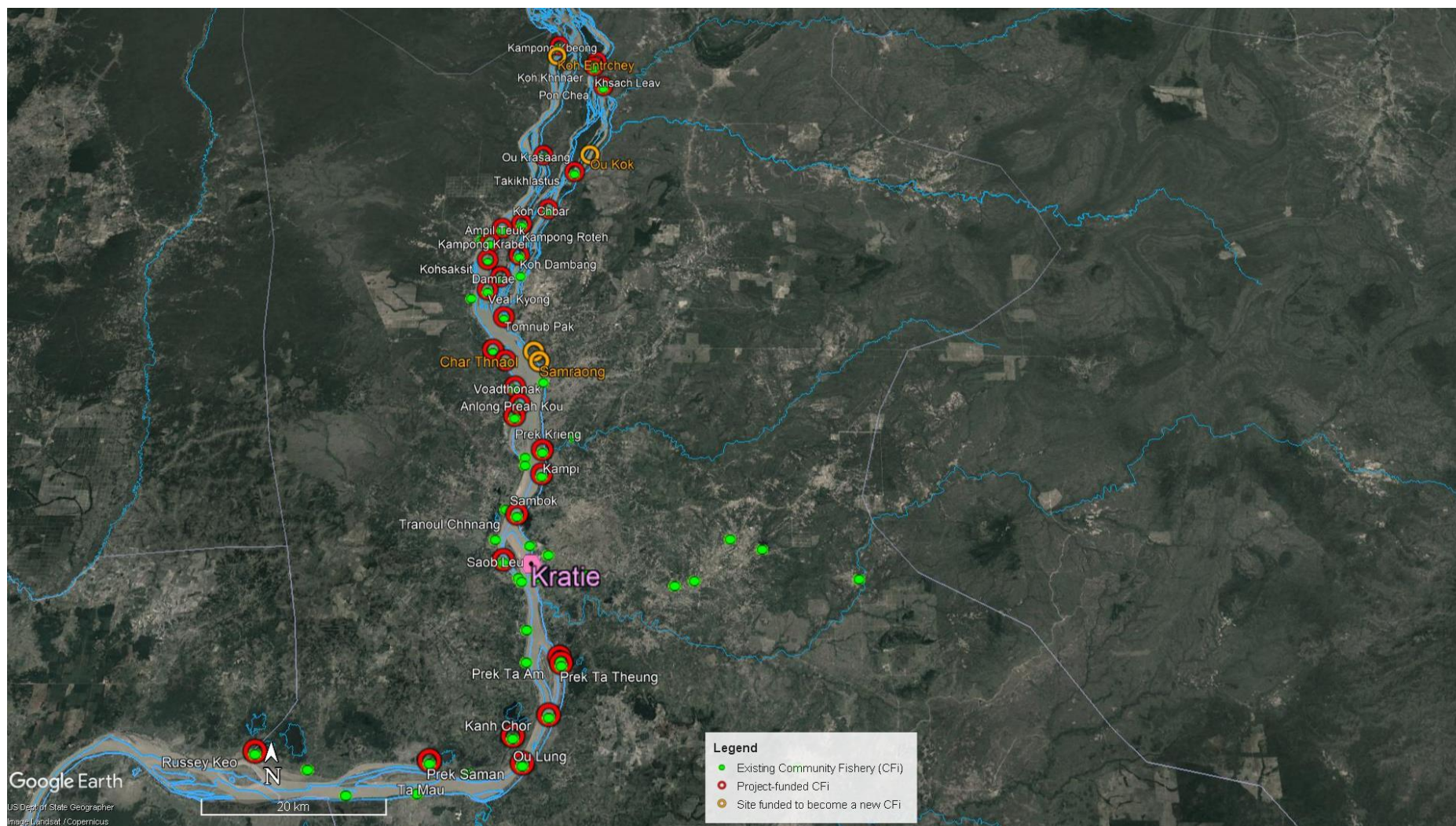


Figure 13: Community Fisheries and new sites selected in Kratie Province

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8. ANNEX 2: CFI FINAL RANKING

(next page)

Top 33%

Middle 33%

Bottom 33%

Prov.	District	Commune	Village	CFi name (in roman script)	Socio-economic potential	Governance potential	Environmental potential	Score	Rank	Selection
K	Sambour	Voadthonak	Preaek Krieng	Prek Krieng	2.64	2.39	2.82	7.86	1	Top 54
K	Sambour	Ou Krieng	Kaoh Khnhaer	Koh Khnhaer	2.67	2.56	2.29	7.52	2	Top 54
ST	Sesan	Sdau	Sdao 1	Sdau 1	2.56	2.11	2.82	7.49	3	Top 54
K	Sambour	Sambour	Kaeng Prasat	Tomnub Pak	2.31	2.33	2.65	7.29	4	Top 54
ST	Thala Barivat	Preah Rumkel	Kandal	Phum Kandal	2.49	2.11	2.65	7.25	5	Top 54
ST	Siem Bouk	Ou Mreah	Ou Chralang	Ou Chralang	2.42	2.33	2.47	7.23	6	Top 54
K	Sambour	Voadthonak	Anlong Preah Kou	Anlong Preah Kou	2.29	2.56	2.35	7.20	7	Top 54
ST	Thala Barivat	Preah Rumkel	Leu	Phum Leu	2.29	2.22	2.65	7.16	8	Top 54
ST	Sesan	Sdau	Stav	Sdau 2	2.27	2.06	2.82	7.15	9	Top 54
ST	Thala Barivat	Kaoh Snaeng	Kaoh Kei	Koh Keuy	2.20	2.17	2.76	7.13	10	Top 54
K	Chetr Borei	Sambok	Kampi	Kampi	2.13	2.06	2.94	7.13	11	Top 54
ST	Stueng Traeng	Sameakki	Thmei	Phum Thmei	2.64	1.83	2.65	7.12	12	Top 54
K	Sambour	Voadthonak	Vodthonak	Voadthonak	2.13	2.56	2.41	7.10	13	Top 54
K	Sambour	Ou Krieng	Pon Ta Chea	Pon Chea	2.38	2.22	2.47	7.07	14	Top 54
ST	Thala Barivat	Kaoh Snaeng	Choam Thum	Koh Kantheay	2.36	1.89	2.82	7.07	15	Top 54
ST	Sesan	Phluk	Phluk	Phloulk Meanchey	2.16	2.22	2.65	7.02	16	Top 54
ST	Siem Bouk	Kaoh Sampeay	Damrei Phong	Damrey Phong	2.49	2.39	2.12	7.00	17	Top 54

Prov.	District	Commune	Village	CFi name (in roman script)	Socio-economic potential	Governance potential	Environmental potential	Score	Rank	Selection
ST	Thala Barivat	Preah Rumkel	Anlong Svay	Anlong Svay 2	2.20	2.28	2.47	6.95	18	Top 54
K	Sambour	Kaoh Khnhaer	Kaoh Chbar	Koh Chbar	2.07	2.28	2.59	6.93	19	Top 54
K	Prek Prasab	Preaek Prasab	Ou Lung	Ou Lung	2.53	1.94	2.41	6.89	20	Top 54
K	Sambour	Ou Krieng	Khsach Leav	Khsach Leav	2.31	2.28	2.29	6.88	21	Top 54
ST	Thala Barivat	Preah Rumkel	Kaoh Chheu Teal Thum	Koh Chheu Teal Thom	2.69	2.06	2.12	6.86	22	Top 54
K	Prek Prasab	Ruessei Kaev	Boeng Rey / Ruessei Kae / Sralau Damnak / Svay Chum	Russey Keo	2.33	2.11	2.41	6.86	23	Top 54
ST	Thala Barivat	Thala Barivat	Veal Khsach	Veal Khsach	2.31	2.06	2.47	6.84	24	Top 54
K	Prek Prasab	Ta Mau	Ta Mau Kandal / Ta Mau Kraom	Ta Mau	2.53	1.89	2.41	6.83	25	Top 54
ST	Thala Barivat	Preah Rumkel	Krala Peas	Krala Peas	2.53	1.61	2.65	6.79	26	Top 54
K	Sambour	Kampong Cham	Kampong Krabei	Kampong Krabei	2.40	2.44	1.94	6.79	27	Top 54
K	Chetr Borei	Bos Leav	Preaek Ta Thoeng	Prek Ta Theung	2.40	1.94	2.41	6.76	28	Top 54
K	Sambour	Voadthonak	Ta Nguon	Ta Nguon	2.11	2.11	2.53	6.75	29	Top 54
ST	Siem Bouk	Ou Mreah	Ou Mreah	Ou Mreah	2.40	2.06	2.29	6.75	30	Top 54
K	Sambour	Boeng Char	Kampong Rotih	Kampong Kbeong	2.44	2.00	2.29	6.74	31	Top 54
K	Sambour	Boeng Char	Kampong Rotih	Ou Krasaang	2.44	2.00	2.29	6.74	32	Top 54

Prov.	District	Commune	Village	CFi name (in roman script)	Socio-economic potential	Governance potential	Environmental potential	Score	Rank	Selection
ST	Sesan	Kamphun	Kamphun	Chur Tameo	1.67	2.22	2.82	6.71	33	Top 54
ST	Thala Barivat	Preah Rumkel	Kraom	Phum Kraom	2.07	1.94	2.65	6.66	34	Top 54
ST	Thala Barivat	Kaoh Snaeng	Kaoh Snaeng	Koh Sneng	2.16	1.67	2.82	6.65	35	Top 54
K	Sambour	Kaoh Khnhaer	Kampong Pnov	Takikhlastus	2.29	2.22	2.12	6.63	36	Top 54
K	Chetr Borei	Thma Kreae	Ruessei Char / Thma Krae Kandal	Tranoul Chhnang	2.13	1.89	2.59	6.61	37	Top 54
ST	Stueng Traeng	Sameakki	Kham Phan	Thmar Takuk	2.16	1.78	2.65	6.58	38	Top 54
ST	Thala Barivat	Kaoh Snaeng	Koh Sralau	Koh Sralau	2.09	1.67	2.82	6.58	39	Top 54
K	Sambour	Kampong Cham	Ampil Tuek	Ampil Teuk	2.40	2.11	2.06	6.57	40	Top 54
ST	Thala Barivat	Ou Svay	Kaoh Pnov	Koh Pnov	2.27	2.00	2.29	6.56	41	Top 54
ST	Siem Bouk	Ou Mreah	Kaoh Chruem	Koh Chruem	2.42	1.83	2.29	6.55	42	Top 54
K	Chetr Borei	Bos Leav	Preaek Ta Am	Prek Ta Am	2.29	1.83	2.41	6.53	43	Top 54
ST	Thala Barivat	Ou Svay	Veun Sien	Veun Sien	2.27	1.61	2.65	6.52	45	Top 54
ST	Stueng Traeng	Sameakki	Kaoh Khan Din	Anlong Koh Kang	2.16	1.72	2.65	6.52	44	Top 54
K	Sambour	Boeng Char	Kampong Roteh	Kampong Roteh	2.44	1.83	2.24	6.51	46	Top 54
ST	Thala Barivat	Preah Rumkel	Kaoh Chheu Teal Touch	Koh Chheu Teal Touch	2.04	2.17	2.29	6.51	47	Top 54

Prov.	District	Commune	Village	CFi name (in roman script)	Socio-economic potential	Governance potential	Environmental potential	Score	Rank	Selection
ST	Thala Barivat	Kang Cham	Kang Kngaok	Kang Kngaok	2.04	2.56	1.88	6.48	48	Top 54
ST	Stueng Traeng	Sameakki	Kham Phan	Anglong Thmar Bang	2.16	1.67	2.65	6.47	49	Top 54
K	Chhloung	Kanhchor	Kanhchor	Kanh Chor	2.51	1.78	2.18	6.47	50	Top 54
K	Prek Prasab	Saob	Saob Leu	Saob Leu	2.36	2.17	1.94	6.46	51	Top 54
K	Sambour	Boeng Char	Damrae	Damrae	2.47	2.11	1.88	6.46	52	Top 54
K	Chhloung	Preaek Saman	Preaek Saman	Prek Saman	2.20	1.78	2.47	6.45	53	Top 54
ST	Thala Barivat	Ou Rai	Pong Tuek	Pong Tuek	1.93	2.39	2.12	6.44	54	Top 54
ST	Sesan	Ta Lat	Svay Rieng / Khsach Thmei / Rumpoat / Ta Lat	Talat Samki Rungreung	2.20	2.11	2.12	6.43	55	Median +2
K	Sambour	Kampong Cham	Kaoh Phdau	Kohsaksit (Koh Phdau)	2.13	2.11	2.18	6.42	56	Median +1
ST	Thala Barivat	Ou Rai	Anlong Svay	Anlong Svay 1	1.89	2.39	2.12	6.40	57	MEDIAN (56 above, 56 below)
K	Sambour	Kampong Cham	Samphin	Veal Kyong	2.40	2.22	1.76	6.39	58	Median -1
K	Sambour	Sambour	Kaoh Sam	Koh Sam	1.91	2.06	2.41	6.38	59	Median -2
ST	Siem Bouk	Kaoh Sampeay	Kaoh Sampeay	Koh Sampeay	2.40	1.67	2.29	6.36	60	Median -3
K	Sambour	Boeng Char	Kaoh Dambang	Koh Dambang	2.31	2.17	1.88	6.36	61	Median -4

Prov.	District	Commune	Village	CFi name (in roman script)	Socio-economic potential	Governance potential	Environmental potential	Score	Rank	Selection
ST	Thala Barivat	Kang Cham	Kang Cham	Kang Cham	1.67	2.44	2.24	6.35	62	Median -5
ST	Siem Bouk	Kaoh Preah	Kaoh Preah	Koh Pras	2.22	1.94	2.18	6.34	63	Median -6
K	Chetr Borei	Sambok	Smabok	Sambok	1.80	2.06	2.47	6.33	64	Median -7
ST	Siem Bouk	Siem Bouk	Ton Soang	Tonsang	1.84	1.89	2.59	6.32	Not selected	
K	Prek Prasab	Preaek Prasab	Thma Reab	Thma Reab	2.24	1.94	2.12	6.31	Not selected	
ST	Thala Barivat	Preah Rumkel	Kaoh Lngo	Koh Lngo	2.29	1.89	2.12	6.30	Not selected	
ST	Thala Barivat	Thala Barivat	Ou Trael	Ou Trael	2.07	2.11	2.12	6.30	Not selected	
ST	Thala Barivat	Ou Svay	Ou Run	Ou Run	1.91	1.89	2.47	6.27	Not selected	
ST	Siem Bouk	Siem Bouk	Ou Lang	Ou Lang	2.13	1.78	2.29	6.21	Not selected	
K	Chetr Borei	Thmei	Svay Chrum	Svay Chrum	1.80	2.22	2.12	6.14	Not selected	
K	Sambour	Sandan	Sandan	Sandan	2.58	1.50	2.06	6.14	Not selected	
ST	Siem Bouk	Siem Bouk	Siem Bouk	Siem Bouk	1.76	1.78	2.59	6.12	Not selected	
K	Prek Prasab	Chrouy Banteay	L'iet	Laet	1.93	2.22	1.94	6.10	Not selected	
K	Chhloung	Khsach Andaet	Thmei Ti Muoy	Phum Thmei	2.09	2.00	2.00	6.09	Not selected	
K	Kracheh	Roka Kandal	Roka Kandal Muoy / Pi	Rokar Kandal	2.13	1.78	2.18	6.09	Not selected	
K	Prek Prasab	Chrouy Banteay	Kampong Dar	Keng Kampong Dor	1.84	1.78	2.41	6.03	Not selected	
K	Prek Prasab	Kampong Kor	Kampong Kor	Kampong Kor	2.13	1.78	2.12	6.03	Not selected	

Prov.	District	Commune	Village	CFi name (in roman script)	Socio-economic potential	Governance potential	Environmental potential	Score	Rank	Selection
K	Prek Prasab	Saob	Preaek Roka	Prek Roka	2.11	1.94	1.94	6.00	Not selected	
K	Chhloung	Han Chey	Hanchey Buon	Han Chey	2.20	1.78	2.00	5.98	Not selected	
K	Prek Prasab	Saob	Preaek Chik	Prek Chik	2.09	1.94	1.94	5.97	Not selected	
ST	Thala Barivat	Ou Svay	Ou Svay	Ou Svay	2.00	1.67	2.29	5.96	Not selected	
ST	Siem Bouk	Ou Mreah	Tboung Khla	Tboung Khla	2.02	1.61	2.29	5.93	Not selected	
ST	Thala Barivat	Ou Svay	Kaoh Hib	Koh Hib	1.91	1.89	2.12	5.92	Not selected	
ST	Siem Pang	Tma Kaev	Nheang Sum	Samros chantha ban	1.27	1.89	2.65	5.80	Not selected	
K	Prek Prasab	Chambak	Chambak Ti Muoy / Ti Pi	Chambak	2.00	1.39	2.41	5.80	Not selected	
K	Prek Prasab	Preaek Prasab	Preaek Prang	Prek Prang	1.62	2.22	1.94	5.79	Not selected	
K	Kracheh	Krakor	Krakor	Krakor	2.16	1.67	1.94	5.76	Not selected	
K	Chetr Borei	Kantuot	Kantuot	Tomnub Ou Kantout	1.93	2.11	1.71	5.75	Not selected	
ST	Thala Barivat	Kang Cham	Kampong Pang	Kampong Pang	1.80	2.06	1.88	5.74	Not selected	
ST	Siem Bouk	Kaoh Sralay	Sma Kaoh	Sma Kaoh	2.42	1.89	1.41	5.72	Not selected	
K	Prek Prasab	Chrouy Banteay	Khsach Tob	Ksach Tub	1.67	2.11	1.94	5.72	Not selected	
ST	Siem Bouk	Srae Krasang	Kaoh Krouch	Koh Krouch	2.09	1.78	1.82	5.69	Not selected	
K	Prek Prasab	Saob	Preaek Prolung	Prek Prolung	1.64	2.06	1.94	5.64	Not selected	
ST	Siem Bouk	Kaoh Sralay	Svay	Svay	2.22	1.89	1.47	5.58	Not selected	

Prov.	District	Commune	Village	CFi name (in roman script)	Socio-economic potential	Governance potential	Environmental potential	Score	Rank	Selection
K	Snuol	Svay Chreah	Ta Saom / Ta Pum	Tomnub Ochor	2.02	1.89	1.65	5.56	Not selected	
K	Sambour	Kampong Cham	A Chen	Kraham Koubak	1.76	1.83	1.94	5.53		
K	Chetr Borei	Sambok	Boeng Run	Beung Run	1.89	1.94	1.65	5.48		
K	Kracheh	Ou Ruessei	Srae Sdau	Sre Sdao	2.00	1.78	1.65	5.42		
K	Chetr Borei	Thmei	B'ier	B'ier	1.58	2.22	1.59	5.39		
ST	Thala Barivat	Ou Rai	Ou Rai	Ou Rai	2.02	1.78	1.53	5.33		
ST	Siem Bouk	Kaoh Sralay	Kang Daek	Kang Daek	2.24	1.89	1.18	5.31		
K	Snuol	Khsuem	Srae Thmei	Srea Thmei	1.73	2.28	1.29	5.31		
K	Sambour	Kampong Cham	Tonsaong Thleak	Ksachsway Brembrey	1.36	2.00	1.94	5.30		
K	Chetr Borei	Kantuot	Antong Vien	Beung Mlich / Anlong Vien	2.38	1.56	1.35	5.29		
K	Chetr Borei	Dar	Mreum	Beung Kas	1.80	1.78	1.71	5.28		
K	Chetr Borei	Thmei	Khnach	Dontrey	1.67	2.22	1.35	5.24		
K	Sambour	Kampong Cham	Yeav	Krang Yeaymao	1.96	2.00	1.18	5.13		
ST	Siem Bouk	Kaoh Sralay	Phchul	Phchul	1.84	1.78	1.47	5.09		
ST	Siem Bouk	Srae Krasang	Srae Krasang	Sre Krasang	1.51	1.94	1.47	4.93		
K	Chhloung	Damrei Phong	Boeng Kieb	Damrey Phong	1.51	1.67	1.71	4.88		
K	Snuol	Khsuem	Khsuem Knong	Khsem	1.78	1.67	1.29	4.74		
K	Sambour	Kaoh Khnhaer	Cheung Peat	Cheang Pheat	1.47	1.17	1.71	4.34		

9. ANNEX 2: Socioeconomic, Governance and Environmental potential of selected CFis

Table 7: Potential of each selected CFi per criterion in Kratie Province

Name of CFi (in Khmer)	CFi Name (in roman script)	Socioeconomic potential	Governance potential	Environmental potential
បូស្មីកែវ	Russey Keo	High	High	High
ពន្លឺជា	Pon Chea	High	High	High
ទំនប់ប៉ាក់	Tomnub Pak	High	High	High
ព្រែកគ្រឿង	Prek Krieng	High	High	High
វាល្អនៈ	Voadthonak	Medium	High	High
តាងួន	Ta Nguon	Medium	High	High
កោះច្បារ	Koh Chbar	Medium	High	High
តាម៉ៅ	Ta Mau	High	Medium	High
ព្រែកតាឃីង	Prek Ta Theung	High	Medium	High
អូរលុង	Ou Lung	High	Medium	High
អំពិលទឹក	Ampil Teuk	High	High	Medium
តាកិះខ្លាស្ទុះ	Takikhlastus	High	High	Medium
ខ្សាច់លាវ	Khsach Leav	High	High	Medium
កោះខ្មែរ	Koh Khnhaer	High	High	Medium
អន្លង់ព្រះគោ	Anlong Preah Kou	High	High	Medium
វាលខ្យង	Veal Kyong	High	High	Low
តំរើ	Damrae	High	High	Low
កោះដំបង	Koh Dambang	High	High	Low
សោបលើ	Saob Leu	High	High	Low
កំពង់ក្របី	Kampong Krabei	High	High	Low
ព្រែកតាអាំ	Prek Ta Am	High	Low	High
កំពង់ក្បឿង	Kampong Kbeong	High	Medium	Medium
អូរក្រសាំង	Ou Krasaang	High	Medium	Medium
កោះសក្តិសិទ្ធិ (កោះផ្តៅ)	Kohsaksit (Koh Phdau)	Medium	High	Medium
ទ្រូនល្អង	Tranoul Chhnang	Medium	Medium	High
កាំពី	Kampi	Medium	Medium	High
ព្រែកសាម៉ាន់	Prek Saman	Medium	Low	High
កញ្ចរ	Kanh Chor	High	Low	Medium
កំពង់រទេះ	Kampong Rotteh	High	Low	Medium
កោះសំ	Koh Sam	Low	Medium	High
សំបុក	Sambok	Low	Medium	High

Table 8: Potential of each selected CFi per criterion in Stung Treng Province

Name of CFi (in Khmer)	CFi Name (in roman script)	Socioeconomic potential	Governance potential	Environmental potential
អូរច្រឡឹង	Ou Chralang	High	High	High
ភូមិកណ្តាល	Phum Kandal	High	High	High
ភូមិលើ	Phum Leu	High	High	High
ស្តៅ១	Sdau 1	High	High	High
អន្លង់ស្វាយ (២)	Anlong Svay 2	Medium	High	High
ភូមិមានជ័យ	Phloulk Meanchey	Medium	High	High
កោះកី	Koh Keuy	Medium	High	High
វាលខ្សាច់	Veal Khsach	High	Medium	High
កោះកន្ទាយ	Koh Kantheay	High	Medium	High
ដំរីផុង	Damrey Phong	High	High	Medium
ក្រឡាពាស	Krala Peas	High	Low	High
ភូមិថ្មី	Phum Thmei	High	Low	High
ជួរតាម៉ៅ	Chur Tameo	Low	High	High
កោះឈើទាលធំ	Koh Chheu Teal Thom	High	Medium	Medium
អូរម្រះ	Ou Mreah	High	Medium	Medium
តាឡាតសាមគ្គីរុងរឿង	Talat Samki Rungreung	Medium	High	Medium
កោះឈើទាលតូច	Koh Chheu Teal Touch	Medium	High	Medium
ភូមិក្រោម	Phum Kraom	Medium	Medium	High
ស្តៅ២	Sdau 2	Medium	Medium	High
កាំងក្បោក	Kang Kngaok	Medium	High	Low
កោះសំពាយ	Koh Sampeay	High	Low	Medium
កោះជ្រើម	Koh Chruem	High	Low	Medium
អន្លង់ស្វាយ (១)	Anlong Svay 1	Low	High	Medium
ពងទឹក	Pong Tuek	Low	High	Medium
កាំងចាម	Kang Cham	Low	High	Medium
វ៉ែនសៀន	Veun Sien	Medium	Low	High
អន្លង់ថ្មបាំង	Anglong Thmar Bang	Medium	Low	High
អន្លង់កោះកាង	Anlong Koh Kang	Medium	Low	High
ថ្មតាកុក	Thmar Takuk	Medium	Low	High
កោះស្រឡៅ	Koh Sralau	Medium	Low	High
កោះស្លែង	Koh Sneng	Medium	Low	High
កោះព្រះ	Koh Pras	Medium	Medium	Medium
កោះព្នៅ	Koh Pnov	Medium	Medium	Medium

Background

The project “Mekong Integrated Water Resources Management - Phase III” is funded by the World Bank. The objective of this project is to establish the foundation for effective water resource and fisheries management in the northeast of Cambodia.

Within this project, Component 1 (Fisheries and aquatic resources management in Northern Cambodia) is executed by the Fisheries Administration and implemented by the Inland Fisheries Research and Development Institute. The objective of this component is to improve the management of fish and aquatic resources in selected areas in Kratie and Stung Treng provinces.