Mekong River Commission
For Sustainable Development

SOCIAL IMPACT MONITORING AND VULNERABILITY ASSESSMENT (SIMVA) 2018

Report on 2018 Baseline Survey of the Lower Mekong Mainstream and Floodplain Areas

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Background

The Social Impact Monitoring and Vulnerability Assessment (SIMVA) 2018 survey was undertaken by the Mekong River Commission (MRC) Secretariat with field surveys implemented by Member Countries. The SIMVA 2018 followed the methodology of the SIMVA 2011 baseline survey and the SIMVA 2014 survey on shocks and trends. The SIMVA 2018 survey primarily builds on these two previous exercises and aims to set a technical framework for decentralized SIMVA field data collection, with the expectation that responsibility will rest fully with Member Countries by 2033.

The objectives of SIMVA 2018 are:

- Provide regular information on the status and trends of the social conditions of the people in the corridor along the Mekong mainstream and around flooded areas, linked to changes in the Basin's aquatic ecosystems.

- Provide data and information on social vulnerability (particularly food and livelihood vulnerability) linked to changes in water resources (e.g. agriculture, aquaculture, fish, other aquatic animals and plants), and people's resilience in coping with those changes.

- Establish social impact indicators that reflect current socio-economic conditions and the extent of people's dependence on water resources.

- Provide data for the MRC 2021–2030 cycle of the basin development planning and monitoring processes.

Approach and methodology

SIMVA 2018 was conducted in a corridor along the Mekong mainstream and around flooded areas in similar periods in the four Member Countries (November 2018 – February 2019 in Cambodia; February 2019 in Lao PDR; and November – December 2018 in Thailand and Viet Nam). Mixed methods were designed, comprising of a quantitative survey at both the household (HH) and village levels, and a qualitative community study. The quantitative surveys were carried out in 200 sample villages with key informants and HH surveys covering up to 2,800 HHs. Surveys on the villages and HHs are all based on questionnaires, including basic socio-economic variables, livelihoods, vulnerabilities, and resilience. The qualitative study on resilience, vulnerabilities, and social impacts was carried out in five villages near MRC monitoring locations through focus group discussions and in-depth interview.

The SIMVA 2018 survey was conducted in the same study sites and used the same methods as in the SIMVA 2014 survey. The villages and HHs in the 2014 survey were prioritized for the 2018 survey. This helps ensure a panel (set of data) to allow trends to be observed over time, which is a key strength of this SIMVA survey. However, the sample size has decreased as the number of villages per country has been decreased from 88 to 50 due to budget constraints, and the number of HHs selected in each village were slightly decreased from 16 to 14. In addition, some indicators and corresponding questions have been adjusted in the 2018 survey, compared to the 2014 one. In addition to having similar information to the 2014 survey, the 2018 survey includes questions to gather information on HH demographics and gender-specific issues.

This report also used the results of the 2011 and 2014 surveys in order to evaluate indicative trends and changes in the 2011–2018 period.

Main findings

Status and trends of the social conditions of the people in the corridor, linked to changes in the Basin's aquatic ecosystems, in the sample areas

- The share of HHs reporting fishing as the most important livelihood increased in Cambodia and Viet Nam from 2011 to 2018, but decreased in Thailand. The option of fishing as the second most important livelihood activity fluctuated in the region with an increasing tend from 2011 to 2014, but a decreasing trend from 2014 to 2018.

- The percentage of HHs with members who fished in the last 12 months decreased from 2011 to 2018. According to the 2018 survey, around 38% of HHs were engaged in fishing in the last 12 months from 45% in 2011, of which 30% of HHs were in Cambodia, 31% in Lao PDR and Thailand, and only 9% in Viet Nam.

- Similarly, the percentage of HHs with members who collected other aquatic animals (OAAs) in the last 12 months decreased in the survey period. The figure for Viet Nam was still lowest of the three other countries. Also, most of HHs never sold other aquatic animals and plants (OAAs/Ps) (48%); only 2% of HHs sold OAAs/Ps more than three times a week; and 1% of HHs sold OAAs/Ps 2–3 times a week. Hence, selling OAAs/Ps was not the main income in the survey areas.

- Regarding the income trend compared to five years ago, 35% of the surveyed HHs said that their income was lower; 32% that it was the same; just 26% that their income increased slightly; and 6% of HHs that their income increased significantly. About 22% of HHs indicated that the income changes related to changes in water resource.

- A small portion of HHs (only 5.4%) shifted their livelihoods because of declined productivity in the natural resources such as fish or OAAs/Ps. These figures show that changes in occupation or livelihood activities were still limited in the last five years. Shifting to farming was dominated by Cambodia and Thailand; shifting to livestock was common in Lao PDR.

- The qualitative survey, albeit more subjective since it is based on focus group discussions (FGDs), revealed several changes in human well-being, occupations, and important events that occurred in the sample villages in the last five years such as flooding and weather-related events such as drought and water shortages, impacting on local livelihood in the sample sites. In addition, agricultural events, including the reduction of fisheries, plant and livestock diseases and events caused by external factors such as low prices for agricultural products detrimentally affected the income of HHs in sample villages, thus impacting the well-being of the communities. People living along the Mekong corridor still depend on agriculture and fisheries activities, hence their well-being is vulnerable to the changes in natural resources and climate.

Vulnerability, particularly food and livelihood vulnerability, linked to changes in water resources

- Riverbanks, island gardens and fields are considered an important agricultural area and they are very vulnerable to flooding and soil erosion. The survey found that 68% of villages had HHs who had riverbanks, island gardens and fields; the highest percentage was in Cambodia, at 94% and Viet Nam, at 78%.

- In the last three years, about 62% of sample villages experienced losses and damages from flooding. Thailand had the highest portion (80%) while Viet Nam had the lowest (42%). Twenty-five per cent of villages observed that the impacts of flooding became much worse, and 25% of villages reported these impacts were worse in the last 12 months than in previous years.

- The main consequences of serious flooding in the last 12 months were overflowing rivers (56% of villages reported) and rainwater that could not drain away (55% of villages reported).

- In the last 12 months, normal rain/monsoon was considered the main source of flooding in the region (34% of villages reported).

- About 61% of villages experienced losses and damages from drought in the last three years.

- Saline intrusion has impacted Vietnamese HH only. The duration of the most severe salinity had been from one to three months. Compared to earlier years, 10% of respondents indicated that the impacts of the most severe salinity intrusion in the last 12 months were worse.

- The availability of drinking water supply is a vulnerability indicator in SIMVA 2018 and is a measure of HH's access to safe drinking water. Drinking water mostly came from bottled water (50%), followed by piped water, at 33% of HHs using this source. The main water source was bottled water (79%) in Thailand and piped water in Viet Nam (67%).

- Regarding services provided to villages, in general, some fundamental services were common in the region, including the electric grid, telephone and Internet connection, healthcare, and feeder roads, while a number of other facilities were still limited, especially agriculture-related services such as markets for selling local fish, aquaculture products and vegetables, ice factory, fish processing facilities, landing place for boats. More than 50% of villages reported that these services were not available.

- Percentage of HHs considered officially as poor by the government was 25.6%. Most of HHs indicated that they had enough food during the last 12 months (94%) and had over two meals per day (85%).

- Eighteen percent of HHs received the support for the poor and 14% received disaster support; Thai households received the largest support, at 88% for support for the poor, and 69% for disaster support. In contrast, Vietnamese households received less support, at less than 3%.

- Around 43% of HHs experienced flooding in the last three years. In the last 12 months, 29% experienced flooding, most of whom were Vietnamese. The percentage of HHs damaged by flooding in the last three years and 12 months were 26% and 20%, respectively. The percentages of cultivated land area and riverbanks, island gardens and fields damaged by flood were 62% and 63%, respectively.

- 39% of HHs experienced drought in the last three years, and 25% of HHs had assets damaged and other losses by drought.

- At the regional level, 66% of villages took actions to cope with climate extreme events. Viet Nam had the highest rate at 88% and Cambodia, the lowest, at 42%.

- In the 2018 survey results indicate that the main strategy to cope with flooding was receiving assistance from the government (6.5%), of whom Thai HHs were the most reliant on government support (19%). Casual work and working outside the home village were the second and the third most common coping measures, at around 4%.

- The 2018 survey's results indicate that the main strategy to cope with drought, was receiving assistance from the government (5.2% of HHs), followed by working outside the village (4%) and shifting from farming to other activities (3%).

- There were very limited coping strategies to deal with negative events occurring in the last five years. It emerged from the FGDs that HHs mostly depended on government and agency support to overcome their difficulties, particularly in Lao PDR. Long-term measures were observed in Thailand and Viet Nam, where people started to change their farming practices and applied climate-resilient and disease-tolerant varieties in farming to mitigate the impacts of climate change and agricultural shocks.

- The dependency ratio of the region in 2018 was 30%; the ratio was highest in Lao PDR 53.8%, followed by Cambodia with 35%, and Thailand with 36%. This correlates to the high fertility rates and relatively large HHs, indicating more traditional extended family structures. HHs in Viet Nam had the lowest dependency ratio (27%), reflecting a more advanced stage in the demographic transition towards modernization. The data from the Mekong Delta could be interpreted as showing a stage in the transition from traditional, extended families to modern nuclear families. In the 2011–2018 period, there was an increasing trend in dependency ratios in all countries except Cambodia; Lao PDR had the highest increase, of nearly 20%.

- There were four large ethnic groups – Khmer in Cambodia (88%), Kinh in Viet Nam (91%), Lao Isan in Thailand (71%) and Lao in Lao PDR (72%). In addition, there were other smaller ethnic groups including Khmou, Tai Lue, Suay, Cham, Chinese, Hmong, Lu Mien, Kaloeng, Lahu, Lamet, Nyo, Phou Thay, Phuan, Ta-oy, Tai, etc.

- In all four countries, the most common marital status of heads of HHs was married, at over 77% whereas separation was the least common, at under 1%.

- The general education level is an indicator for resilience and ability to adapt to changing circumstances. Primary school completion was the highest level among 39% of heads of HHs; 33% of heads of HHs completed lower secondary school. These figures suggest a relatively high level of vulnerability in corridor communities.

- Gender is an important aspect of vulnerability. Traditional gender roles are in force in many areas of the LMB corridor, and women and men do not have the same opportunities for employment and pay. A female-headed HH was vulnerable in a number of ways – legally, socially, and economically, since it is typically also a single- parent HH. The survey found that 19% of the HHs were headed by females and 81% by males. Lao PDR and Viet Nam had the lowest rate of female-headed HH, at 13%, while Thailand had the highest rate, at 27%.

- Local people were aware of the cause of climate extreme events. At the village level, the most serious flooding was caused by the overflooding of rivers, and the main sources of flooding were from normal rain/monsoon and extended monsoons. The major causes of drought were extreme weather/climate change.

- Local knowledge on weather-related events was considered the most reliable source of knowledge for 52% of HHs, followed by radio in the village. TV was the most reliable information sources indicated by Thailand, at 73% of HHs and Lao PDR with 49%.

Conclusion

The SIMVA 2018 survey provided information on the status and trends on the social-economic conditions of the people in the Mekong River corridor and the trend in people's dependence on water resources. The survey also provides data and information on social vulnerability (particularly food and livelihood vulnerability) linked to changes in water resources (agriculture, aquaculture, fish, and OAAs/Ps), and people's resilience in coping with these changes. The results of the 2018 survey with 2,800 HHs in 200 villages indicated that communities in the Mekong mainstream corridor were still largely dependent on the river water-related resources for their livelihoods, income, and well-being. As such, they are still vulnerable to changes in the Mekong water resources. However, the overall dependency has decreased with other, non-water resources-related livelihood activities, such as wage employment or business/trading, which play increasingly important roles in their overall livelihood strategy. The survey results also showed that while government support could be critical in helping HHs cope with vulnerabilities, and indeed basic services such as primary infrastructure (roads, schools, commune health clinics, simple water and sanitation), there is still significant room for improvements in the production-related support services. This is an important policy implication for the government if communities are to be protected from water- and climate-related vulnerability.

Main recommendations for SIMVA

It is recommended that the SIMVA survey continue, given its uniqueness in providing primary data on communities' direct dependency on water-related resources. The next SIMVA surveys on social vulnerability (particularly food and livelihood vulnerability) linked to changes in water resources (agriculture, aquaculture, fish, OAAs/Ps) will remain unchanged to allow for a comparison of past events and predictions of future trends. Surveys should be carried out every four years to track changes over time.

The data collection approach is important to ensure accurate data for a temporal overview of the situation on the Mekong mainstream. It is vital to train staff collecting data to ensure understanding of the required data and consistency.

Arranging and conducting interviews with HHs can be time-consuming. In some cases, the HHs did not agree to complete the survey. The number of replacement HHs should be increased, and when an original HH was not available, an alternative was selected to reduce the time burden for data collection.

Regarding the reliability of data, some questions were understood differently in different countries; as a result, some collected data were inconsistent. Thus, it was necessary to ensure that the questionnaires were clear and easy to understand.

When entering data, all the countries should develop codebooks and have the same coding in order to ensure that the aggregate data for the entire region are calculated and analysed accurately.

Regarding data analysis, some answers were categorized as "Other" but were not specified. Therefore, further analysis of the data may clarify what the 'Other' category covers.

■■■ INTRODUCTION

1.1 Background

SIMVA activities begun in 2004, and before this survey, four phases of study had been completed. Phase 1, 2004–2006, was an extensive literature review. Phase 2, 2008–2009, was a pilot survey to determine the validity of indicators and research tools. Phase 3, 2011–2012, was a baseline survey in the LMB corridor, which applied the methodology developed in Phase 2. Phase 4 focused on climate-related shocks and trends, and resilience and coping strategies. The SIMVA 2018 is Phase 5 of the process.

SIMVA 2018 aimed to create a panel dataset with SIMVA 2014 that allows to analyse changes in the major indicators between 2014 and 2018. In addition, panel data also have certain advantages: they allow a researcher to analyse several important economic questions that cannot be addressed using cross-sectional or time-series datasets. More importantly, the advantage of panel data derives from their theoretical ability to isolate the effects of specific actions, treatments, or more general policies.

As a general framework for the core SIMVA survey going forward, SIMVA 2018, omitted the special module on shocks and trends, which were the focus of SIMVA 2014. Instead, the 2018 survey included further questions on resilience and vulnerabilities, which are the central elements of SIMVA. SIMVA 2018 also created a framework for social vulnerability and resilience indicators in this pilot decentralized survey, which will be applied in future, more decentralized, SIMVA surveys.

SIMVA 2018 is designed as a regional study of rural villages and households (HHs) located within a 15-km buffer zone on each side of the Mekong mainstream and around major floodplains in Cambodia and in the Mekong Delta. The survey focuses on the resilience and vulnerabilities of villages and HHs in the LMB Corridor. Livelihood vulnerability is the balance between the sensitivity and resilience of livelihood systems. Highly vulnerable systems are characterized by low resilience and high sensitivity, while less vulnerable systems have low sensitivity with high resilience. Livelihood resilience allows a system to absorb and utilize (or even benefit from) change. In the context of climate change, vulnerability has been defined as "the degree to which a system is susceptible to, and unable to cope with, the adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity" (IPCC, WG2, 2007, p. 6).

The objectives of SIMVA 2018 are as follows, as noted in the SIMVA 2018 Guidelines:

- Provide regular information on the status and trends of the social conditions of the people in the corridor, linked to changes in the Basin's aquatic ecosystems.
- Provide data and information on social vulnerability (particularly food and livelihood vulnerability) linked to changes in water resources (agriculture, aquaculture, fish, OAAs/Ps) and people's resilience in coping with these changes.
- Establish social impact indicators that reflect current socio-economic conditions and the extent of people's dependence on water resources.
- Provide data for the MRC 2021–2030 cycle of basin development planning and monitoring processes.

The relationship between socio-economic conditions and people's dependency on water resources determines their vulnerability to changes in the water resources. The long-term monitoring of

SIMVA has the following objectives:

- Identify any significant changes in people's access to water resources.

- Identify any significant changes in HH welfare and livelihoods.

- Link these changes to their levels of vulnerability, including livelihood vulnerability.

- Help measure potential social impacts of economic activities and possible projects in the Lower Basin region.

1.2 Relevance and benefits to MRC, LMB countries and local communities

SIMVA will allow for a comparison of conditions in different socio-ecological zones, and will thereby give Member Countries a unique opportunity to obtain an overview of the situation along the whole of Mekong mainstream, across national boundaries. These data are not yet covered in the national monitoring systems. As such, SIMVA data fill a critical gap and can be used for assessing transboundary trends, issues and development opportunities. Local communities will benefit from the knowledge generated by SIMVA, through its application in water resources development initiatives such as flood protection, irrigation, and fisheries regulations.

1.3 Research questions

- What types of positive or negative changes related to the Mekong River system and water resources, and impacts from these changes have villages and HHs experienced, over the past 12 months (quantitative survey), and the past five years (qualitative study)?

- Have these changes and impacts been different in the different socio-ecological zones?

- What has been the strength or severity of these positive or negative impacts from changes?

- What are the vulnerabilities of the HHs living in the corridor with regard to the Mekong River system and water resources (water quality, water level, flow, flooding, fish and OAAs/Ps, irrigated agriculture, riverbank gardens, drinking water supply, navigation and other livelihoods)?

- How resilient are HHs in coping with the changes related to the Mekong River system and water resources?

- What measures have HHs and village communities taken to cope with the negative impacts?

- What types of impacts have occurred abruptly, without warning, at a scale so they can be considered shocks?

- What are the socio-economic conditions that determine more resilience to shocks?

- What are the livelihoods of the HHs living in the corridor for the Mekong River system and water resources (water quality, water level, flow, flooding, fish and OAAs/Ps, irrigated agriculture, riverbank gardens, drinking water supply, navigation, and other livelihoods)?

- What long-term trends over the last five years can be identified in the use and condition of river water resources, fisheries, irrigation, navigation, timber floating, tourism, and livelihoods at the community level?

1.4 Answers to the research questions

The following indicators were identified as relevant for answering the research questions. The relationship between the indicators and the research questions, and where they are presented in the report is as follows:

Research questions and the main related findings	Results presented in

1. What types of changes related to the Mekong River system and water resources and impacts from these changes have villages and HHs experienced?

- The percentage of HHs with members who fished in the last 12 months decreased from 2011 to 2018.

- Similarly, the percentage of HHs with members who collected OAAs in the last 12 months decreased in the survey period.

- There was a fluctuation in the percentage of fishing as the most important livelihood, showing an increasing trend from 2011 to 2014, but a decreasing trend from 2014 to 2018.

- A small portion of HHs (only 5.4%) shifted their livelihoods due to reduced productivity of the natural resources, such as fish, other aquatic animals or collected plants.

- Compared to 2011, the percentage of HHs with income from OAAs has dropped except in Thailand.

- About 22% of HHs indicated that the income changes related to changes in the water resources.

3.2 Main livelihood activities in the sample villages

3.6. Riverbank and garden fields

4.2 HH livelihood activities

4.3 HH income and asset,

4.4 HH vulnerability

4.5 Agricultures and fisheries and OAAs/Ps collection

4.6 Climate change-related social vulnerability

2. Have these changes and impacts been different in the different socio ecological zones?

- The above changes and impacts were different in the different socio-ecological zones. For example, the share of HHs reporting fishing as the most important livelihood increased in Cambodia and Viet Nam from 2011 to 2018, but decreased in Thailand.

- In Cambodia and Thailand, shifting to farming was the most common change, and shifting to livestock raising was common in Lao PDR.

Section 4.1 Flooding

Section 4.2 Drought

Section 4.3 Extreme weather in the last 12 months

3. What has the strength or severity of these positive or negative impacts from changes been?

- Two-thirds of sample villages experienced losses and damages from flooding and drought.

- A quarter of villages observed that the impacts of flooding and drought were worse in the last 12 months than in earlier years

3.7. Losses and damages by flooding, drought, and saline intrusion

4. What are the vulnerabilities of the HHs living in the corridor with respect to the Mekong River system and water resources?

- Almost all of the survey villages had HHs that lived on riverbanks, island gardens and fields.

- One-thirds of HHs were engaged in fishing in the last 12 months in the 2018 survey.

- The river/stream was an important fishing habitat in the region except for Viet Nam where other lakes/wetlands and mainstream were more common habitats.

- Two-thirds of villages reported that a loss of assets or animals from flooding in the last 12 months.

- Sixty percentage of cultivated land area and riverbanks, island gardens and fields were damaged by flood.

3.6 Riverbank and garden fields

3.7. Losses and damages by flooding, drought, and saline intrusion

5. How resilient are HHs in coping with the changes related to the Mekong River system and water resource?

- HH's resilience level could depend on the dependency ratio, livelihood assets, sources of income, health, educational level, consumption of fish and OAAs/Ps.

- The dependency ratio in 2018 was 30%. HH's common assets were TVs, mobile phones, motorbikes, and water tanks. For the whole region, the mean residential land area per HH was approximately 802 m2.

4.1 Demographic and education characteristics of HHs

4.2 HH livelihood activities

4.3 HH income and assets

4.5 Agricultures and Fisheries and OAAs/Ps collection

- Business was the largest source of income in the region, followed by rice sales and full-time employment.

- A low percentage (10%) of the heads of HHs had completed upper secondary school or higher levels.

- A large percentage of HHs purchased and consumed fish and OAAs/Ps more than three times a week, while only 3% of HHs consumed them less than twice a month.

- HHs are likely to be less resilient to change due to a high dependency ratio, limited assets, and a low educational level.

6. What measures HHs and village communities taken to cope with negative impacts?

- Two-thirds of villages took action to cope with climate extreme events.

3.8 The adaptation of village to climate change

4.6 Climate change-related social vulnerability

- Receiving assistance from the government was the most important measure to cope with flooding and drought, followed by casual work, working outside the village and shifting from farming to other activities.

7. What types of impacts have occurred abruptly, without warning, at a scale that they can be considered shocks?

- Many different types of events occurred in the last five years that had impacts on the communities in the four countries. In general, some of the important events that had effects on local communities were climate events, such as flood and drought, the decrease of fish resources, diseases in crops and livestock as well as major events derived from natural and human causes.

3.8 The adaptation of village to climate change

4.6 Climate change-related social vulnerability

8. What are the socio-economic conditions that determine more resilience to shocks?

- The conditions include demographic and education characteristics of HHs (dependency ratio, education level), livelihood, income, vulnerability, early warning and disaster preparedness. Village public services such as water supply and facilities, and water-related infrastructure also have impacts on resilience.

3.4 Water resources and facilities

3. 5 Water-related infrastructure

4.1 Demographic and education characteristics 4.2 HH livelihood activities

4.3 HH income and assets

4.4 HH vulnerability

4.5 Agriculture and fisheries and OAAs/Ps collection

4.6 Climate change-related social vulnerability

4.7 Early warning and disaster preparedness

9. What are the livelihoods of the HHs living in the corridor that depend on the Mekong River system and water resources?

- Crop farming was the most important occupation in the study area (46%). Water resource-related livelihoods accounted for a small portion. Fishing was the most important livelihood for only 3% of the HHs and the second important activity for only 4% of HHs.

- Each of the other water resource-dependent occupations, such as the collection of OAAs/Ps, fish processing, aquaculture, navigation, and sand mining from the river, were the most or second most important activities for less than 1% of the HHs.

3.2 Main livelihood activities in the sample villages

4.2 HH livelihood activities

4.5 Agricultures and Fisheries and OAAs/Ps collection

10. What long-term trends over the last five years can be identified at the community level?

- Compared to the 2014 survey, crop farming is still the major livelihood in all study sites, reflecting that local livelihoods are vulnerable to changes in water resources and climate change impacts. Trading (included services) has become the second most important occupation. Working outside in other districts or provinces was a very common livelihood activity for almost all of the sample villages.

- In the four countries, the populations mostly travelled to other fishing areas in order to fish.

- There were some improvements in local infrastructure such as the construction of new roads and bridges in Viet Nam.

- Compared to the 2014 survey, losses and damages from main climate shocks, especially flooding, increased significantly in all areas.

5.2 Main events that occurred in the last five years

5.3 Main occupations and the trends in the villages

1.5   Structure of the Report

This regional report presents the main findings from the analysis of data collected for both the quantitative survey and the qualitative study of the SIMVA 2018 survey on livelihoods, vulnerability and resilience, and case studies in the Lower Mekong Basin Corridor in Cambodia, Lao PDR, Thailand, and Viet Nam. This report comprises six main parts:

Part 1. The introduction provides an overview of the SIMVA survey, objectives, and rationale as well as the 2018 survey research questions.

Part 2. Methods and the survey process describe the study area, methods, sampling procedure, and the changes that have been made to SIMVA 2014 compared to SIMVA 2018.

Part 3. The village profile presents the results of the village survey in terms of village characteristics, population, livelihoods activities, labour mobility and how they are distributed in the different socio-ecological zones. The village profile data are obtained from information at the village level. This section also presents findings on riverbank cultivation, the use of water resources, and source of drinking waters. In addition, it provides data on the occurrence of extreme weather events such as flooding, drought and saline intrusion, their impacts on villages, and coping strategies at the village level. Data were included on the occurrence of these disasters in the last 12 months and in the last three years, as well as the main causes of them. The categories of the impacts ranged from much less to much worse.

Part 4. The HH survey presents the results of the HH survey, regarding information on the status and trends of the social conditions of people in the corridor in the sample areas, linked to changes in the Basin's aquatic ecosystems, as well as information on social vulnerability (particularly food and livelihood vulnerability) linked to changes in water resources (agriculture, aquaculture, fish, OAAs/Ps), and people's resilience in coping with these changes and establish social impact indicators that reflect current socio-economic conditions and the extent of people's dependence on water resources.

Part 5. Qualitative study results present the findings from the qualitative survey based on FGDs in the sample villages. This section shows the essential information on the main trends in positive and negative events and factors over the last five years, which influences the socio-economic situation and community well-being of villages in the Mekong River corridor, with a focus on water-related factors.

Part 6. Conclusions and Recommendations highlight the main observations in the 2018 survey. Recommendations for future SIMVA surveys and recommendations for continued and enhanced, relevant activity areas for the MRC are discussed.

Four National Reports complement this Regional Report. The National Reports provide more detail on the findings from each of the Member Countries. The National Reports include discussions on national perspectives on SIMVA, both in terms of the study findings, and in terms of its sustainability as a process of integrative data collection and analysis.

▪▪▪ METHODS AND SURVEY PROCESS

2.1 Study area

SIMVA 2018, like SIMVA 2011 and 2014, is conducted in a corridor along the Mekong mainstream and around major flooded areas around Tonle Sap in Cambodia, Songkhram in Thailand, and in the Mekong Delta. This section represents the rationale for this spatial focus of the survey, which has been mentioned in previous SIMVA reports for the benefit of readers.

SIMVA is concerned primarily with people's dependence on water resources and their vulnerability to changes in the availability of these resources. For this reason, the geographical areas used to analyse this relationship must make both ecological and social sense.

The clearest link between natural resources and users is within 'social-ecological' systems where people have adapted to their environment over hundreds of years. Within these areas, the interdependence between people and the ecosystems they inhabit has evolved to create generally resilient environments where both man and nature can sustain certain levels of change.

A social-ecological system (SES) is defined as "an integrated system of ecosystems and human society with reciprocal feedback and interdependence". The concept emphasizes the 'humans-in-nature' perspective (Resilience Alliance, 2007).

Thus, SIMVA focuses on the SESs (also known as habitats) identified through earlier work carried out by the Integrated Basin Flow Management (IBFM) for the corridor, and by WWF (with MRC support) in 2006 for the whole basin. They use a classification framework for sub-basins and streams that focuses on ecological functionality, which is based on hydro-geomorphic characteristics. The categories considered were:

- Water flow system type (e.g. headwater vs. pass-through watershed, small vs. large streams, floodplain type)
- Elevation (and derivatives, e.g. slope)
- Geology
- Vegetation
- Hydrology (e.g. surface runoff, river discharge)
- Stream network characteristics (e.g. river density, sinuosity).

Based on these categories, stakeholders developed an initial hierarchical classification scheme: each category was subdivided into different elevation zones, and each of these unique combinations was then further subdivided according to geology and vegetation, etc. This was then developed further to define 10 sub-basin classifications for the region, 8 of which apply to the LMB. The classifications are named after the natural ecosystems, although it is recognized that they have been largely transformed by agriculture and forestry. Studies show that the residents of these areas have adapted their livelihoods to the ecosystems, effectively becoming an integral part of the environment they manage and transform. The classification of SESs of the Mekong Basin is shown in Figure 1.
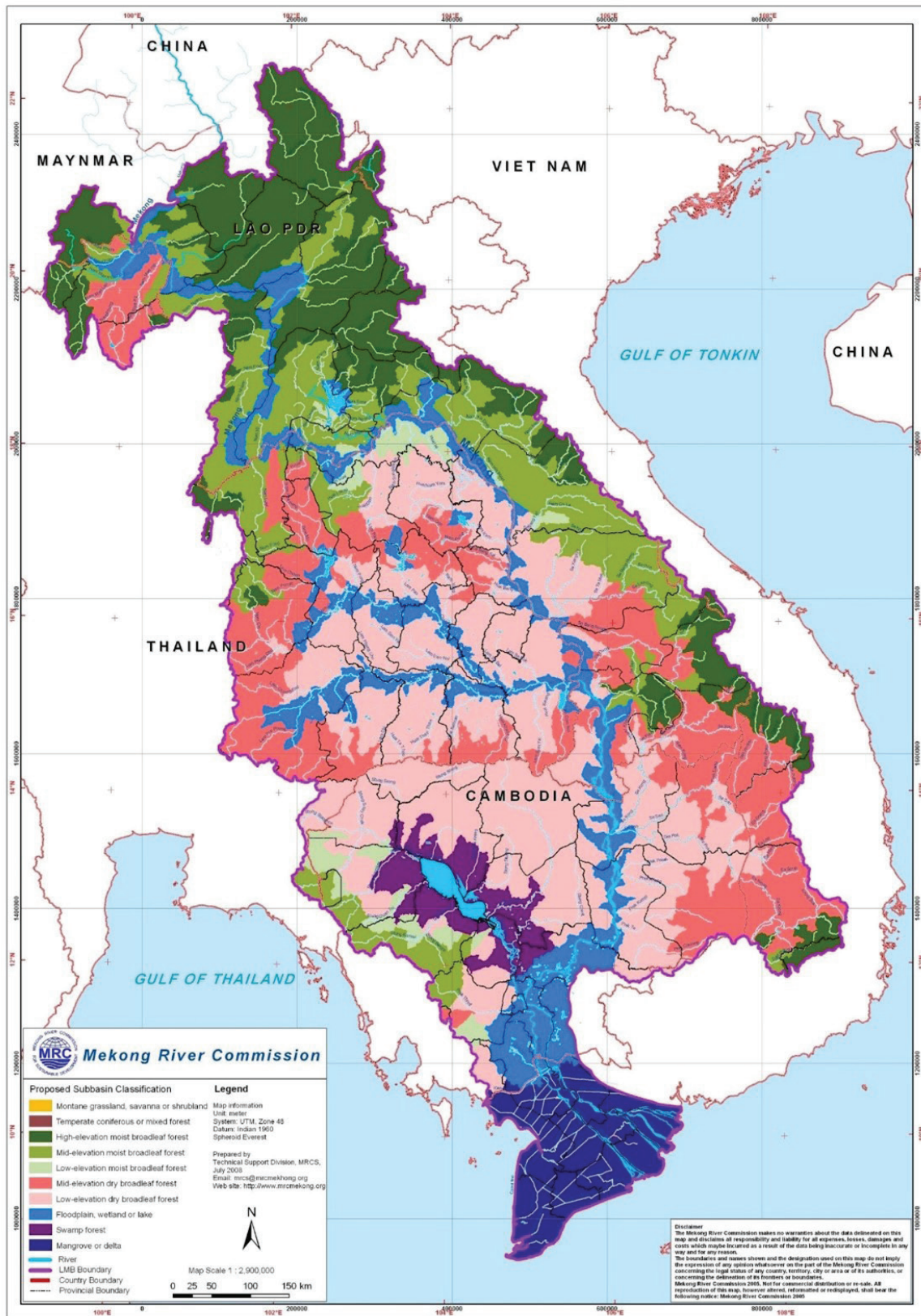
Figure 1. Classification of social-ecological systems of the Mekong Basin

The SIMVA surveys including the 2018 survey were conducted within a 15 km buffer zone on either side of the Mekong mainstream and around a major floodplain, where most people live and which represents a zone of high usage. The rationale for the 15-km corridor is that it emerged from analysis of the SIMVA primary data that the amount of resources use decreases significantly with distance from the Mekong River. The data showed that people tend to make use of ecosystems that can be reached, on average, within 15 to 20 minutes. Beyond 10 km to 15 km, distance becomes a constraint, even for those with vehicles. Beyond 15 km, it is assumed that river resource use becomes rare, except under special circumstances such as the seasonal migration of farmers to the Tonle Sap during peak fishing periods, many of whom likely come from outside the corridor. A weakness of the approach used for determining the corridors is that it does not take this seasonal use into account, nor does it consider how travel time to access the Mekong varies according to topography.

The survey applied similar definition of zones and sub-zones as used in SIMVA 2014. Table 1 lists the zones and subzones for SIMVA 2018 in relation to the original IBFM zones. Figure 2 shows the sub-zones.

Table 1. IBFM and SIMVA zones

Hydro-ecological zone	Description: IBFM	Description: SIMVA	Social survey sub-zones	Description
Zone 1	Lancang, China	Lancang, China	n.a.	n.a.
Zone 2	From the Chinese border to Vientiane (Upstream)	From the Chinese border to Vientiane (Upstream)	Zone 2A – Lao – Mainstream	Lao PDR side of Zone 2.
			Zone 2 B – Sub-zone Upper Thailand	Thai side of Zone 2 in 2 significantly different sub-zones: upper stream in Chiang Rai and Phayao Provinces and Lower stream west of Vientiane in Loei and Nong Khai Provinces.
			Zone 2 C – Sub-zone Lower Thailand	
Zone 3	From Vientiane to Pakse	From Vientiane to the Lao-Cambodian border	Zone 3 A – Sub-zone Lao – Mainstream	Lao side of zone 3 along the Mekong mainstream (incl. Vientiane).
			Zone 3 B - Sub-zone Thailand – Mainstream	Thai side of zone 3 along the Mekong mainstream.
			Zone 3 C – Sub-zone Thailand – Songkhram	App. 40 km upstream from the confluence of Songkhram and Mekong – wetland areas and undammed river.

Zone 4	From Pakse to Kratie	From the Lao-Cambodian border to Cambodian-Vietnamese border	Zone 4 B – Sub-zone Cambodia – 3S	App. 40 km from confluence of 3S and Mekong – undammed river, special eco-system.
			Zone 4 A - Sub-zone Cambodia – Khone Falls to Kratie	Along Mekong mainstream down to the start of the floodplain
			Zone 4 C – Sub-zone Cambodia – Kratie to Viet Nam border	A 15-km zone around the maximum flooded area on the floodplain along the Mekong mainstream and Bassac east and south of Phnom Penh.
Zone 5	From Kratie to Phnom Penh (upstream), incl. Tonle Sap	From Phnom Penh up to and including Tonle Sap Lake	Zone 5 A – Sub-zone Cambodia – Tonle Sap River	Since the socio-ecological system of Tonle Sap River is considered different from the Lake, a special sub-zone was drawn.
			Zone 5 B – Sub-zone Cambodia – Tonle Sap Lake	The area is defined as 15 km around the maximum flooded area (in 2000).
Zone 6	From Phnom Penh to the South China Sea (the Delta)	From the Cambodian-Vietnamese border to the sea (the Delta)	Zone 6 A - Sub-zone Viet Nam – Mekong Delta – freshwater	The sub-zone covers the area of the Mekong Delta, which has freshwater.
			Zone 6 B – Sub-zone Viet Nam – Mekong Delta – saline	The saline sub-zone has special characteristics such as problems with saline intrusion.
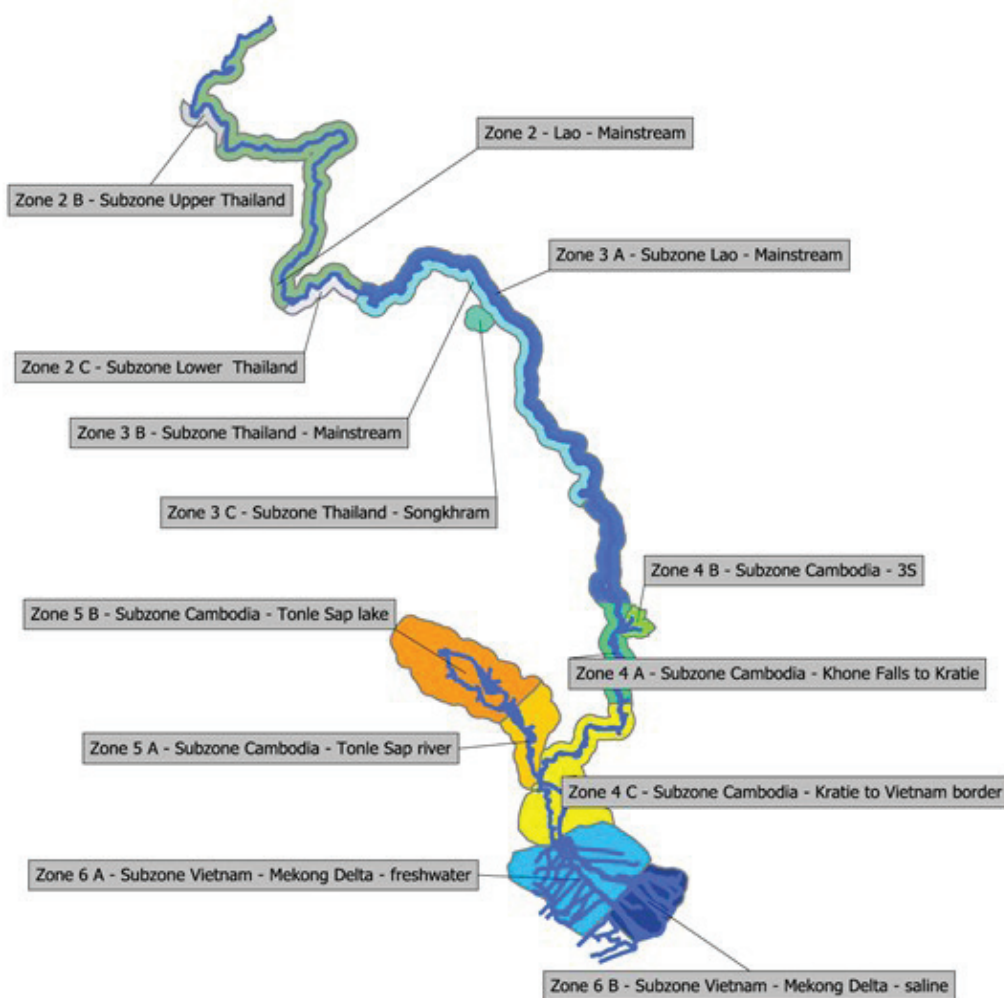
Figure 2. Socio-ecological zones, sub-zones and sample villages and communes for SIMVA 2018

2.1 Study framework

SIMVA 2018 applied a mixed method design, comprising a quantitative survey at both the HH and village levels, and a qualitative community study. The data from the different instruments were analysed both separately and in combination to provide a comprehensive analysis.

The qualitative and quantitative data were collected over the same time, and the information will be integrated into the interpretation of the overall results. The qualitative data enrich the description of the statistical results from the quantitative method. This implies that the qualitative data are used to describe and analyse aspects or patterns in the quantitative survey data.

SIMVA 2018 comprised three complementary data collection tools and methods:

Quantitative: Village Survey	Quantitative: HH Survey	Qualitative study on resilience, vulnerabilities, and social impacts
• In 200 sample villages • Village questionnaire • Key informants: Head of villages and/or commune officials • Includes basic socio-economic variables, such as available services and infrastructure	• In 200 sample villages • Village questionnaire • Key informants: Head of villages and/or commune officials • Includes basic socio-economic variables, such as available services and infrastructure	• In 200 sample villages • Village questionnaire • Key informants: Head of villages and/or commune officials • Includes basic socio-economic variables, such as available services and infrastructure

Figure 3. SIMVA 2018 modules

The village survey was applied in all the villages in which the HH survey was carried out, and both were carried out in the villages that had been previously selected in SIMVA 2014.

The village survey aimed to obtain information at the community level. The village data can be checked against the data from the HH survey, for example, on the use of riverbanks, island gardens and fields, and fishing gear count. The village survey includes information that does not emerge from the HH survey, such as on available services and infrastructure, which can be used to assess the general level of development of the sample villages.

2.3 Application of methodology

2.3.1 Quantitative survey

Units of analysis

The design of this study and the structure of data allow for different levels of analysis:

- For basic analysis, the unit of analysis is the HH. This unit is used to measure some frequency indicators and the proxy relationship of HH-related indicators for monitoring purposes.

- For multilevel analysis to examine the relationship between the contextual characteristics (socio-ecological) and socio-economic and livelihood of HHs, the units of analysis is a sub-zone, a village, and a HH. A zone can be a unit of analysis if data on its socio-ecological characteristics are combined. The aim of this study design is to have data at the sub-zone (aggregated from village data), village, and HH levels.

Sampling method and sample size

Determining the sample size for HH surveys was complicated. Although there are various statistical formulas and techniques to determine sample size, selection of an appropriate formula for a particular targeted population usually depends on availability of resources for study. After reviewing the necessary conditions, especially by considering the sample proportions, standard errors, and design effects of these key variables, a sample size of 2,800 HHs was recommended to ensure reliable estimates for this study with a 95% confidence level.

Stratified sampling is a probability sampling procedure in which the target population (HHs) is first separated into mutually exclusive, homogenous strata (zones and sub-zones), and then the primary sampling units (villages) are selected from each zone and sub-zone. Technically, stratification almost always improves the accuracy of estimates by producing smaller standard errors because the stratum variability is eliminated and only the stratum components are left. In SIMVA 2014 and SIMVA 2018, the sub-zones are used as strata.

Table 2. Number of HHs and villages in different SIMVA surveys

	Number of HHs in 2018	Number of villages in 2018	Number of HHs in 2014	Number of villages in 2014	Number of HHs in 2011	Number of villages in 2011
Cambodia	**700**	**50**	**1,385**	**88**	**680**	**34**
Zone 4	350	25	693	44	340	17
Zone 4 B – Sub-zone Cambodia – 3S	56	4	63	4		
Zone 4 A – Sub-zone Cambodia – Khone Falls to Kratie	168	12	346	22		
Zone 4 C – Sub-zone – Kratie to Viet Nam border	126	9	284	18		
Zone 5	350	25	692	44	340	17
Zone 5 A – Sub-zone Cambodia – Tonle Sap River	168	12	346	22		
Zone 5 B – Sub-zone Cambodia – Tonle Sap Lake	182	13	346	22		
Lao PDR	**700**	**50**	**1,385**	**88**	**680**	**34**
Zone 2 – Lao – Mainstream	350	25	692	44	340	17
Zone 3 A – Sub-zone Lao – Mainstream	350	25	693	44	340	17
Thailand	**700**	**50**	**1,385**	**88**	**680**	**34**
Zone 2	350	25	692	44	340	17
Zone 2 C – Sub-zone Lower Thailand	154	11	346	22		
Zone 2 B – Sub-zone Upper Thailand	196	14	346	22		
Zone 3	350	25	693	44	340	17

Zone 3 B – Sub-zone Thailand – Mainstream	168	12	347	22		
Zone 3 C – Sub-zone Thailand – Songkhram	182	13	346	22		
Viet Nam	**700**	**50**	**1384**	**88**	**680**	**34**
Zone 6 A – Sub-zone Viet Nam – Mekong Delta – freshwater	350	25	692	44	340	17
Zone 6 B – Sub-zone Viet Nam – Mekong Delta – saline	350	25	692	44	340	17
Total	**2,800**	**200**	**5,539**	**352**	**2,720**	**136**

The village selection process

Since one purpose of SIMVA 2018 is to build a panel dataset that covers similar HHs, as in SIMVA 2014, the same sample villages and HHs as in SIMVA 2014 were used to draw villages (and then HHs).

From the sample of villages in 2014, the authors drew a subset of villages for 2018. Using equal sampling, 50 villages were selected in each country. Thus, for example in 2018, we needed to select 25 villages in Sub-zone 6A Viet Nam from the list of 44 villages in Sub-zone 6A Viet Nam 2014. We randomly drew 25 sample villages from these 44 villages in Sub-zone 6A. The same procedure was used for all other sub-zones. Villages were omitted if GPS measurement in the field, when compared with the map, indicated that they were outside the 15-km corridor or buffer zone around flooded areas.

Process of HH selection

The SIMVA 2014 interviewed 16 HHs per sample village. For SIMVA 2018, 14 HHs were randomly selected from the list of 16 HHs in the sample villages for interviews and the two other HHs were used as replacement HHs in case a HH could not be reached or refused to be interviewed after several attempts by the enumerators.

When the enumerators could not locate the HHs in the village to obtain a proper panel data set, they were able to select replacement HHs from the same village. The list of HHs in the village was obtained in advance so that the team could randomly select the replacement HH from the list.

2.3.2 Qualitative survey

In addition to the quantitative survey, qualitative research was used to complement the study. The qualitative research aimed to examine in-depth questions related to the resilience and vulnerabilities of HHs, with a special focus on long-term trends and issues. Each Member Country selected five villages among those already selected for the qualitative research in 2014. The main criteria for selecting the villages was that they were among the ones already selected in the SIMVA 2014 qualitative survey. Selected villages also had to be close to other MRC monitoring sites, e.g. hydrology monitoring stations, to correlate, where possible, community characteristics collected under SIMVA with those gathered in these other monitoring exercises.

The qualitative instruments included in-depth interviews with individuals who were knowledgeable

about the issues; (2) FGDs with a group of HHs.

2.4 List of indicators

The goal of the SIMVA study is to analyse the relationship between socio-economic conditions and people's dependency on water resources to determine their vulnerability to changes in the water resources along the LMB corridor and major wetlands (Songkhram and Tonle Sap).

Addressing the above goal of the study, the SIMVA survey 2018 covered the list of indicators as shown in Table 3. The list was built based on the MRC Indicator Framework and the indicator list in SIMVA 2014.

The indicator list covered the following dimensions: (i) HH demographics; (ii) HH-level vulnerabilities; (iii) dependence on fish and OAAs; (iv) dependence on irrigation and riverbank cultivation; (v) resilience; (vi) climate change-related social vulnerabilities; and (vii) gender-specific indicators.

Table 3. Preliminary list of indicators

	INDICATORS	SIMVA 2011	SIMVA 2014	SIMVA 2018
	A. HH demographics			
1	% female	Yes	No	Yes
2	% dependence	Yes	Yes	Yes
3	HH size	Yes	Yes	Yes
4	Age of head of HH	Yes	Yes	Yes
5	Sex of head of HH	Yes	Yes	Yes
6	Marital status of head of HH	Yes	Yes	Yes
7	Education of head of HH	Yes	No	Yes
8	Highest education in the HH	Yes	Yes	Yes
9	Ethnicities of the head of HH	Yes	Yes	Yes
	B. Vulnerabilities			
10	% who did not finish primary school	Yes	No	Yes
11	Access to safe water	Yes	No	Yes
12	Access to clean toilet facilities	No	No	Yes
13	Distance to the closest health clinic	No	No	Yes
14	% of HHs with a sick HH member	No	No	Yes
15	With health insurance	No	No	Yes
16	% with a bank account	No	No	Yes
17	% with unpaid debt	No	No	Yes
18	% with access to electricity, by source	No	No	Yes
19	Access to information: radio or TV	Yes	Yes	Yes
20	Access to information: fixed or mobile phone	Yes	Yes	Yes
21	Received government support for natural disasters and climate change	No	No	Yes

22	Poor HH (as designated by the local authority)	No	No	Yes
23	Received government support for poor HHs	No	No	Yes
24	% of HH that had enough food to eat in the last 12 months	No	No	Yes
25	Number of meals a week on average?	No	No	Yes
	C. Dependence on Fish and OAAs			
26	% of adults whose most important occupation is fishing	Yes	Yes	Yes
27	% of HHs whose most important livelihood is fishing	Yes	Yes	Yes
28	% of HHs whose 2nd most important livelihood is fishing	Yes	Yes	Yes
29	% of HH income per capita from fish sales	Yes	No	Yes
30	% of HHs with income from fish sales	Yes	Yes	Yes
31	Mean monthly income per capita from fish sales	Yes	No	Yes
32	% of HHs with members who fished in the last 12 months	Yes	Yes	Yes
33	% of HHs fishing in the mainstream/Tonle Sap Lake in the last 12 months	Yes	No	Yes
34	% meals with fish in a week?	No	No	Yes
35	% of HHs with income from OAAs	Yes	Yes	Yes
36	Mean HH monthly income per capita from OAAs	Yes	No	Yes
37	% of HHs that collected OAAs in the last 12 months	Yes	Yes	Yes
38	% of HHs that fished OAAs in the mainstream/Tonle Sap in the last 12 months	Yes	Yes	Yes
39	% of HH income per capita from OAA	Yes	No	Yes
	D. Dependence on irrigation and riverbank cultivation			
40	Mean area of land cultivated by HH in the last 12 months	Yes	Yes	Yes
41	% of HHs dependent on water drawn from the Mekong for irrigation in the last 12 months	Yes	Yes	Yes
42	Mean monthly HH income per capita from rice sales	Yes	No	Yes
43	% of HH income from irrigated crops including rice	Yes	No	Yes
44	% of HHs with riverbank cultivation	Yes	Yes	Yes
45	Mean size of riverbank cultivation	Yes	Yes	Yes
	E. Resilience			
46	Area of cultivated land owned by the HH	Yes	No	Yes
47	% of HHs with non-aquatic sources of income	Yes	Yes	Yes
48	% of HH with wage income	Yes	No	Yes
49	% of HH with non-farm business income	Yes	No	Yes
50	% of HH that received remittances	Yes	No	Yes
51	% of income from remittances	Yes	No	Yes
52	Mean monthly income from non-aquatic sources	Yes	No	Yes
53	% of HHs engaged in water-related livelihoods	Yes	Yes	Yes
54	% of HHs that stated that they had alternative livelihood options	Yes	Yes	Yes

55	Number of livestock units per capita	Yes	No	Yes
	F. Climate change-related social vulnerabilities			
56	Percentage of loss of cultivation due to floods, droughts, and salinity intrusion	Yes	Yes	Yes
57	Value of cultivation lost due to floods, droughts and salinity intrusion	Yes	Yes	Yes
58	Proportion of loss of livestock due to floods and droughts	Yes	Yes	Yes
59	Value of livestock loss due to floods and droughts	Yes	Yes	Yes
60	Average values of property losses due to floods, droughts, and/or other forms of climate variability	Yes	Yes	Yes
61	Most frequently used coping strategies for floods, droughts, and other forms of climate variability	Yes	Yes	Yes
	G. Gender-specific indicators			
62	Labour force participation rates for 15+, by sex	No	No	Yes
63	% of female heads of HHs	No	No	Yes
64	Gap in HH income between female- and male-headed HHs	No	No	Yes
65	Primary completion rate, by sex	No	No	Yes
66	Graduation at upper secondary, by sex	No	No	Yes
67	Education attainment of population aged 25 and over, by sex	No	No	Yes
68	% of adults who earned wages from the most important and second most important occupation, by sex	No	No	Yes
69	% of adults whose main occupation is water-related (fishing, collecting OAAs, aquaculture, fish processing, navigation, sand mining), by sex	No	No	Yes

Method of calculating indicators: The indicators are calculated based on the data from quantitative survey, which includes village and HH surveys. The figures for the whole region are calculated as the averages of data of the four countries. Weights were not used in calculating 2018 indicators to be consistent with data in the 2014 and 2011 reports.

2.4.1 Link to the MRC Indicator Framework

The MRC Indicator framework includes 15 strategic indicators within five dimensions, i.e. social, environment, economic, climate change, and cooperation.

The SIMVA indicators are closely linked with the Social Indicators in the MRC Indicator Framework. In particular, the social dimension in the MRC Indicator Framework included three strategic indicators: (i) living conditions and well-being; (ii) livelihoods and employment; and (iii) overall social condition. All of these dimensions are central in the SIMVA list of indicators. In Table 4, the living conditions and well-being dimensions as well as the overall social condition dimension of the MRC Indicator Framework are captured by the SIMVA indicators under sections (B) HH-level vulnerabilities and (F) climate change-related social vulnerabilities of the SIMVA Indicator List, above. The livelihoods and employment aspects are mostly reflected in sections (C) dependence on fish and OAAs, (D) dependence on irrigation and riverbank cultivation, and (E) Resilience.

The social dimension includes seven Assessment Indicators: (i) food security; (ii) water security; (iii) health security; (iv) access to electricity; (v) employment in LMB corridor water-related sectors; (vi)

economic security; and (vii) fender equality in employment and economic management.

Table 4. Link between SIMVA 2018 Indicators with the Social Dimension in the MRC Indicator Framework, August 2018 Version

Social Dimension Strategic Indicators	Assessment Indicators	SIMVA 2018 Indicators
1. Living conditions and wellbeing	1. Food security	% of HHs that had enough food to eat in the last 12 months (I 24)
		# of meals a week on average? (I 25)
	2. Water security	All indicators under (D) Dependence on irrigation and riverbank cultivation
		% of HHs engaged in water-related livelihoods (I 53)
	3. Health security	Access to safe water (I 11)
		Access to clean toilet facilities (I12)
		Distance to the closest health clinic (I13)
		% of HHs with a sick member (I14)
		% of HHs with health insurance (I15)
	4. Access to electricity	% of HHs with access to electricity, by source (I18)
	5. Employment in LMB corridor water-related sectors	All indicators in C. Dependence on Fish and OAAs
2. Livelihoods and employment in MRC sectors	6. Economic security	All indicators in E. Resilience
	7. Gender equality in employment and economic engagement	All indicators in G. Gender-specific indicators
3. Overall social conditions	-	All indicators in B. Vulnerabilities

To some extent, the SIMVA indicator list also contributes to the economic dimension of the MRC Indicator Framework, which includes two strategic indicators: economic performance of MRC sectors and contribution to the basin economy. Various indicators on employment and livelihoods in the SIMVA list of indicators will help to establish the importance of the MRC sectors to HH welfare as well as indicate the trend and patterns of those sectors.

The SIMVA Indicator list also contributes to Climate Change Strategic Indicators of the MRC Indicator Framework. In particular, the Strategic Indicator 11, climate change trends and extremes, and Strategic Indicator 12, adaptation to climate change can be reflected through various indicators under F, climate change-related social vulnerabilities in the SIMVA Indicator list.

In addition, by comparing the countries' overall economic and social condition at the HH level in the Basin areas, the SIMVA indicator list can contribute to the Strategic Indicators on the Cooperation Dimension, in particular to Strategic Indicator 13: Equity of benefits derived from the Mekong River system.

2.4.2 Link with the Sustainable Development Goal indicators.

The Sustainable Development Goals (SDGs), also known as the Global Goals, are a universal call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity. These 17 SDGs build on the successes of the Millennium Development Goals (MDGs), while including new areas such as climate change, economic inequality, innovation, sustainable consumption, peace, and justice, among other priorities. The Goals are interconnected – often the key to success in one will involve tackling issues more commonly associated with another.

The SDGs work in the spirit of partnership and pragmatism to make the right choices now to sustainably improve life for future generations. They provide clear guidelines and targets for all countries to adopt following their priorities and the environmental challenges of the world at large. The SDGs are an inclusive agenda: they tackle the root causes of poverty and unite us together to make a positive change for both people and planet.

Table 5. The link between SIMVA Indicators and the SDGs

SDGs	Indicators in SIMVA 2018	Comments
SDG1: No poverty	22 and 23	It is possible to calculate the total income and compare it to national statistics and national poverty lines.
SDG2: Zero hunger	25 and 26	
SDG3: Good health and well-being	13, 14, 17, 18, 19, 20, 21	
SDG 4: Quality education	7, 8, 10	
SDG 5: Gender equality	63, 64, 65, 66, 67, 68, 69, 70	
SDG6: Clean water and sanitation	11,12	
SDG 7: Affordable and clean energy	19	
SDG 8: Decent work and economic growth	Employment-related indicators under dependence on fish and OAAs, dependence on irrigation and riverbank cultivation, and resilience	
SDG 9: Industry, innovation, and infrastructure	13, 18, 19, 20, 21	
SDG 10: Reduced inequality	Indicators under income and assets	It is possible to derive an inequality index based on income and assets data.
SDG 11: Sustainable cities and communities	Indicators under climate change-related social vulnerabilities	
SDG 12: Responsible consumption and production	Indicators under (C) Dependence on fish and OAAs and (D) Dependence on irrigation and riverbank cultivation	
SDG 13: Climate action	Indicators under Climate change-related social vulnerabilities	
SDG 14: Life below water	Indictors under (C) Dependence on fish and OAAs	
SDG 15: Life on land	Indicators under (D) dependence on irrigation and riverbank cultivation	
SDG 16: Peace, justice, and strong institutions	N/A	
SDG 17: Partnership for the goal	N/A	

■■■ THE VILLAGE PROFILE

3.1 Village characteristics

3.1.1 Topography of sample villages

Location and topography can be used to determine dependence on resources and exposure to climate change, flooding, and drought. For example, the villages on floodplains or riverbanks are more likely to have more water and fishery resources; however, they are also more likely to be affected by flooding than those on mountains or plateaus. The topology of the villages was characterized by various features, as shown in Figure 4. The floodplains and plains were the most common topography of all sample villages in general, in which 30% of the villages are located. As a result, human living activities strongly depend on the hydro-regime of the Mekong River. According to the report, "Mekong Adaption and Resilience to Climate Change" (USAID, 2013), the LMB supports around 65 million people, most of whom depend on agriculture and natural resources. The livelihoods and food security of most of the Basin's rural inhabitants are closely linked to the Mekong River and its waterways.
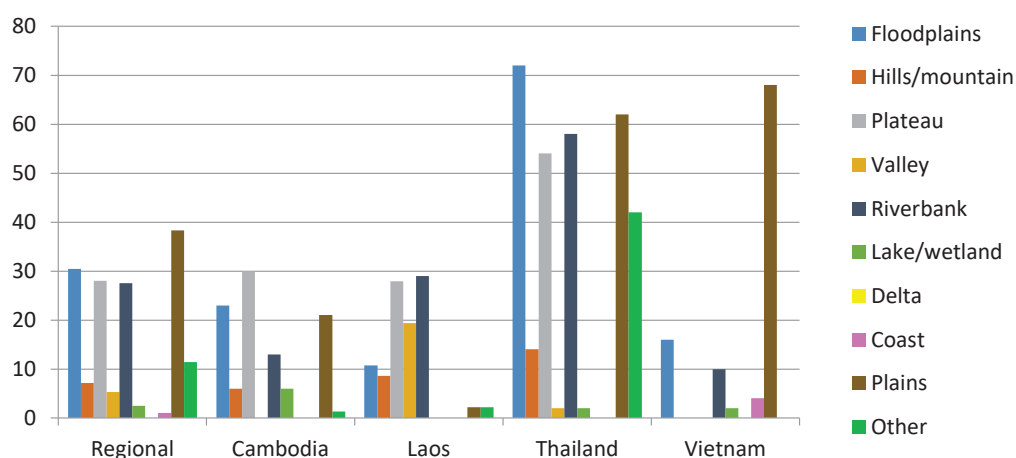
Figure 4. Topography of the sample villages

3.1.2 Population and number of HHs of sample villages

Table 6 presents the characteristics of sample villages including the area, population, and female percentage. The average area of sample villages is 716 ha; the average population was 1,263 people per village. The average percentage of females of these villages was 51.6%, which is similar to the 2014 survey (50%).

Table 6. Area and population characteristics

Countries	Average area of surveyed village (ha)	Average number of HHs in the village	Average population	Average female population
Regional	716	288	1,263	657
Cambodia	609	232	997	494
Lao PDR	1,279	234	1,214	634
Thailand	429	178	629	334
Viet Nam	461	463	1,998	1,037

3.2 Main livelihood activities in the sample villages

SIMVA contains details on the most and second most important occupations in terms of sustaining the livelihood of a HH. Table 7 presents the list of main livelihoods of the 2018 survey: 74% of survey villages considered crop farming the main occupation, followed by livestock, non-farm business/ trading and casual/seasonal work, with 57%, 48% and 39%, respectively. In the 2014 survey, these activities were also considered the main occupations, and crop farming was also the most important occupation. According to MRC (2018), the main water-related economic sectors in the LMB corridor were agriculture and fisheries. Employment in water-related sectors in the LMB corridor remained high, although the importance of direct employment, particularly in agriculture, declined as work opportunities in other sectors – often services and manufacturing located outside the LMB corridor – develop.

Table 7. Main livelihood activities in the sample villages (%)

No.	Main livelihood	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
1	Crop farming	74	25	76	100	94
2	Livestock	57	14	74	64	74
3	Non-farm business/ trading	48	13	78	18	82
4	Casual/seasonal work	39	14	22	38	80
5	Fishing	29	16	4	58	36
6	Other	20	10	14	22	32
7	Handicrafts	15	2	18	22	16
8	Aquaculture	13	3	4	16	30
9	Remittances from relatives	12	0	18	12	18
10	Collect OAAs/Ps	15	2	41	4	14
11	Support from government or non-governmental organizations	9	0	6	18	10
12	Service sector	8	1	16	6	8
13	Industry/mining	5	0	2	0	16

14	Forestry	4	1	4	8	4
15	Navigation river transport	3	0	4	2	6
16	Fish processing	1	1	0	2	0

3.3 Labour mobility in the area

Destinations of the workplace are an indicator of the mobility of the workforce and therefore of the locations where economic development and opportunities are concentrated. Possible workplaces included: (i) other villages in the same district – the percentage of people working in other villages indicates the level of local workforce mobility; (ii) other districts or provinces – the percentage of people working in these areas indicates the level of within-country regional economic integration; (iii) country capital – the percentage of people working in this area indicates country-level urban concentration in large urban areas; and (iv) other countries. The figure for 'other countries' indicates the level of economic opportunities within the country compared to regional work opportunities. it emerged from the survey that almost all sample villages have people working outside their districts (98%) indicated that labour migration was a significant, alternative livelihood option for the local people in the Mekong River corridor. Labour migration to other districts or provinces was the most popular option (43%); it was highest in Viet Nam (88%). Moving to the country capital was the second most popular option (31%); it was highest in Thailand (78%) (Figure 5). Labour migration to another country was highest in Lao PDR (47%). These results are similar to those of the report, "Crop production for food security and rural poverty: Baseline and pilot modelling", conducted by MRC (2014). According to the report, migration is increasing across the region in search of land, resources, and employment. Three main types of migration prevail: (i) rural-urban migration, the most significant type but one that can be highly temporary and seasonal; (ii) transboundary migration, driven partly by a significant diaspora of fellow nationals or ethnicities in neighbouring countries; and (iii) rural-rural migration.
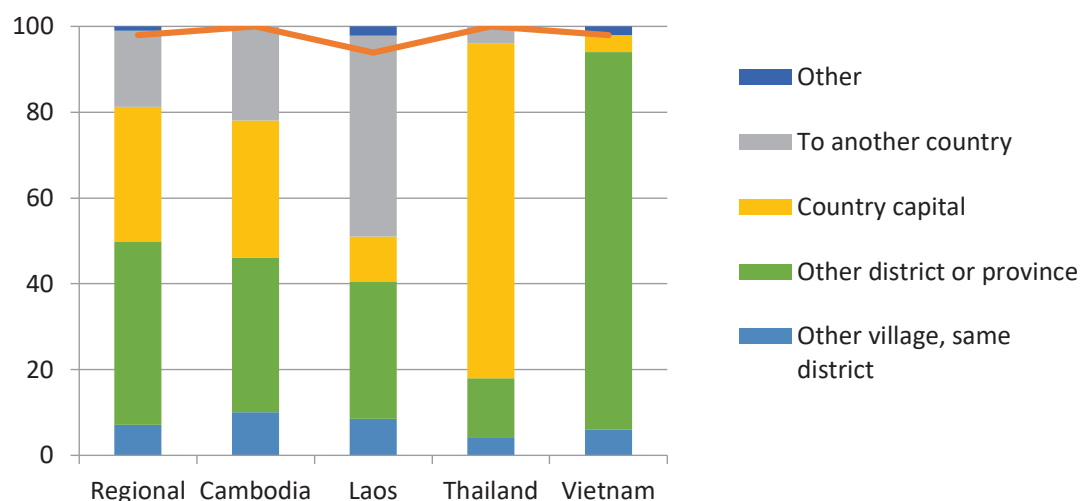
Figure 5. Location mostly travel to work

In addition, in 77% of the sample villages, people worked outside the village to fish. These findings are similar to in the 2014 survey. People typically migrate to fish for less than a month (81%); the trend is similar in Lao PDR (100%), Viet Nam (86%) and Thailand (86%). A small portion (10%) of survey villages had people working outside for aquaculture. The most common duration of migration was 3–6 months (46.5%) (Figures 6 and 7).
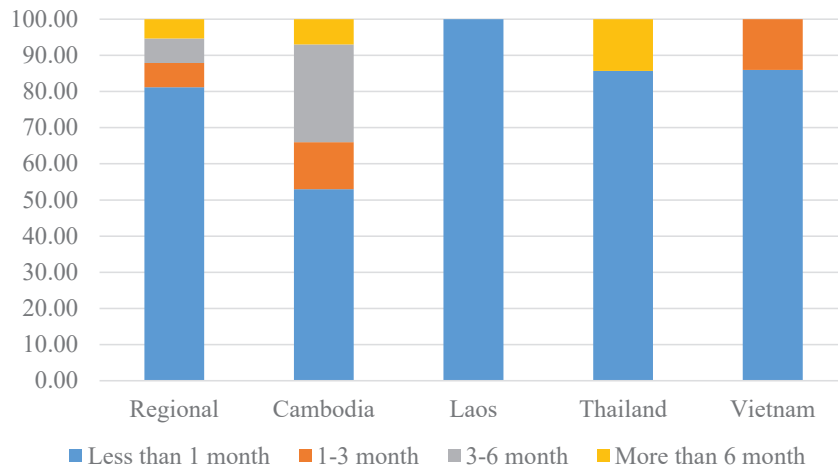
Figure 6. Length of time people typically migrate to fish
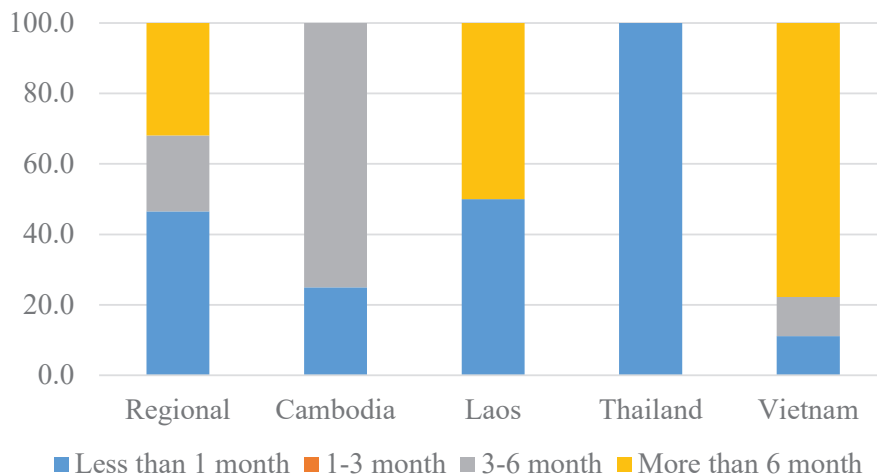
Figure 7. Length of time that people typically migrate for aquaculture

In sum, the local people adopted a strategy to cope with the changes related to the Mekong River system and water resources.

3.4 Source of water and facilities

The percentage of HHs in each sample village using drinking water as a water sources provides information on water resource and service situations of these regions. Overall, bottled water was the most common water source (50%), and the main water source in Cambodia, Lao PDR and Thailand. Overall, piped water was the second most common water source (33%), and the most common in Viet Nam (67%). In Lao PDR, other water sources, such as the gravity-fed spring water system, were used significantly more often than the remaining water sources, such as drilled wells, dug wells, rainwater, springs and rivers. It should be noted that no village had hydropower for irrigating reservoirs. These findings show an improvement in the drinking water supply in the sample villages (Figure 8).
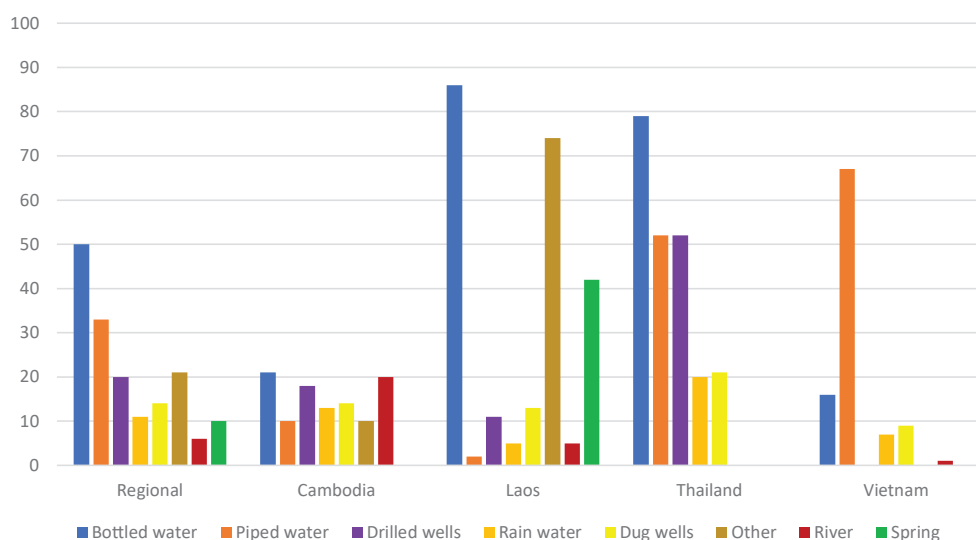
Figure 8. Drinking water supply used by HHs (%)

Drilled wells (72.4% of villages) were most available water source in the wet season; in Viet Nam, 100% of survey villages had this source of water. Rainwater was the second most available water source (67.5%). In Thailand, the highest proportion of all villages used rainwater (100%) (Table 8).

In the dry season, drilled wells were still the most common water source, which was available in 54.7% of sample villages, especially in Cambodia (70%) and Thailand (64%). Piped water and rivers were the second and the third most available water sources in the region, 52% and 48%, respectively (Table 9).

Table 8. Availability of water in the wet season (%)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Drilled wells	72.4	70	23.8	88	100
Rainwater	67.5	70	12.2	100	78
Piped water	56.8	24	2.4	92	100
Rivers	52.6	34	7.1	62	100
Dug wells	44.3	38	23.8	26	86
Other	42	30	88	50	0
Springs	3.1	4	9.5	0	0
Reservoir– irrigation	3.1	0	0	12	0
Reservoir – hydropower	0.5	2.4	0	0	0

Table 9. Availability of water in the dry season (%)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Drilled wells	54.7	70	21.4	64	58
Piped water	52.1	26	2.4	72	100
River	48.4	32	7.1	48	100
Other	41.5	30	88	34	14
Dug wells	34.7	36	18.6	24	58
Rainwater	30.7	6	0	44	68
Springs	3.1	4	9.8	0	0
Reservoir – irrigation	1.6	0	0	6	0
Reservoir – hydropower	0.5	0	2.4	0	0

Electricity supply, Internet, education and health infrastructure, market infrastructure, etc. and their condition were included in the survey to evaluate the public and private services of a village that contribute to its resilience to changes related to the Mekong River system and water resources. In general, some fundamental services were widespread in the region; and others were still limited, especially agriculture-related services and facilities such as markets for selling local fish, aquaculture products and vegetables, ice factories, fish processing facilities, and landing places for boats. The villages reported that these services were not available more than 50% of the time (Figure 9).
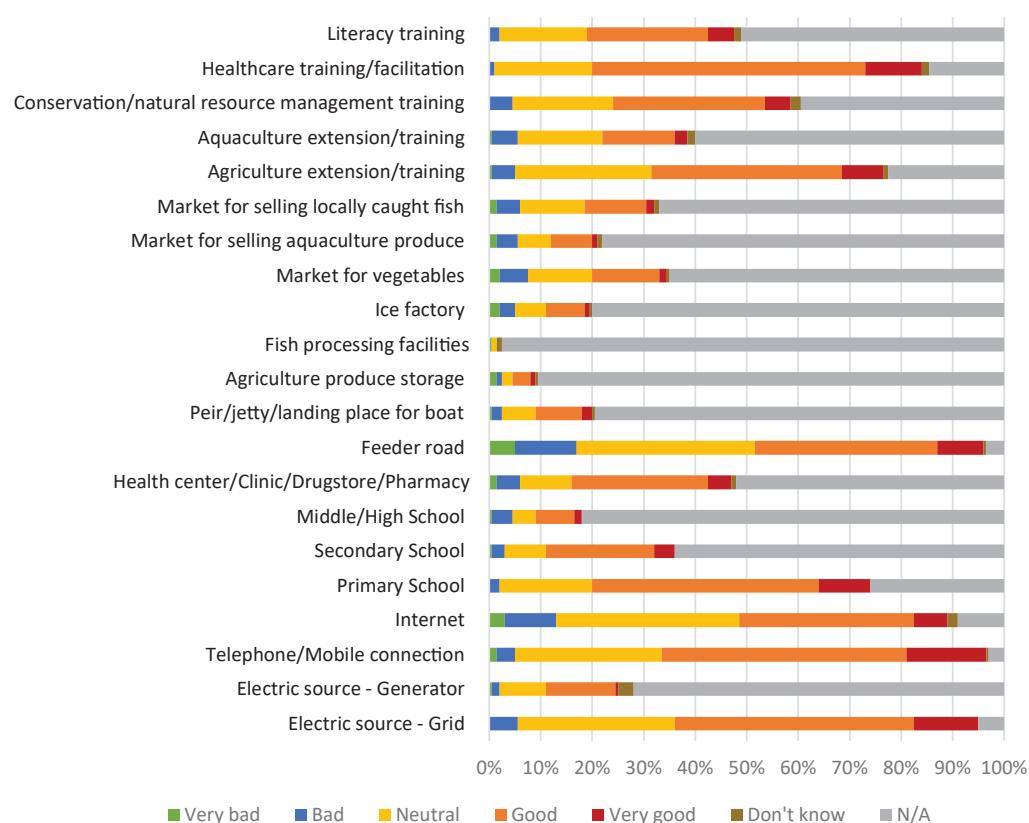
Figure 9. The condition of village public and private services

3.5 Water-related infrastructure

Data on water infrastructure are shown in Table 10: 21% of the sample villages had irrigation dams; 20% had riverbank protection; 27% had river dykes (Viet Nam had the highest rate, at 66%); and 29% of villages had bridges over water.

Regarding water related assets and fishing related equipment, on average, about 50 HHs in a village had motorboats, the highest average was in Viet Nam (131 HHs). About 75 HHs per village had fishing gear; 63 HHs per village had hooks; and around 50 HHs had gillnets and cast nets.

Table 10. Water-related physical infrastructure (% of villages)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Irrigation dams	21	20	40	4	18
Hydropower dams	1	0	2	0	0
River training structures (flows)	6	0	0	2	20
Riverbank protection	20	0	10	38	32
River dykes	27	0	14	26	66
Weirs	25	8	18	52	22
Bridges over water	29	6	34	52	22
Other	9	6	2	26	0
Reservoir – hydropower	0.5	0	2.4	0	0

3.6 Riverbanks, island gardens and fields

Riverbanks, island gardens and fields are considered an important agricultural area and are highly vulnerable to flooding and soil erosion. The survey found that 68% of villages had HHs who have riverbanks, island gardens and fields; the highest percentage was in Cambodia (94%) and in Viet Nam (78%) (Figure 10). Riverbanks, island gardens and fields were mostly privately owned (66%). In the region, the average area of riverbank garden was 186 ha per village; most HHs had more than 800 m2 (53%). Cambodia had the highest number (495 ha per village) (Figure 11).
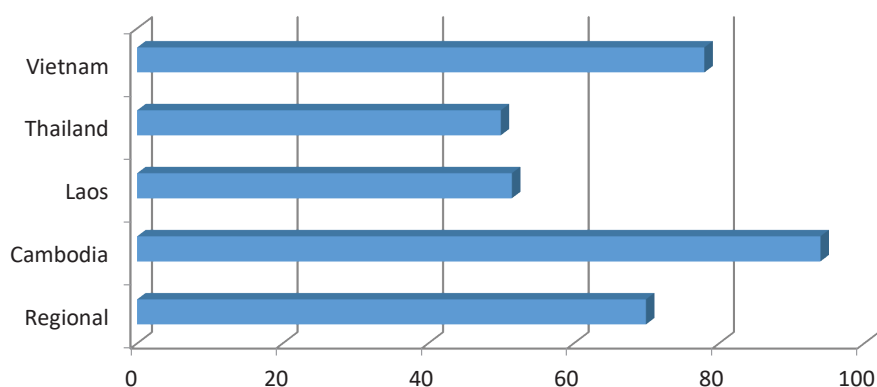
Figure 10. HHs in the village with riverbanks, island gardens and fields (%)
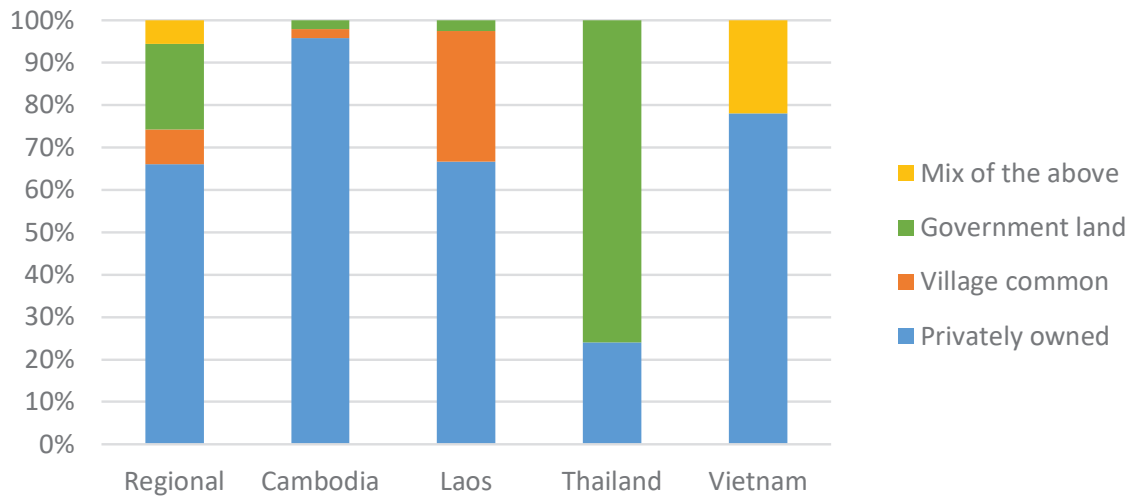
Figure 11. Ownership of the riverbanks, island gardens and fields (%)

3.7 Losses and damages by flooding, drought, and saline intrusion

3.7.1 Losses and damages by flooding

In the last three years, around 62% of sample villages experienced losses and damages from flooding. Thailand had the highest portion at 80%, while Viet Nam had the lowest at 42% (Figure 12).
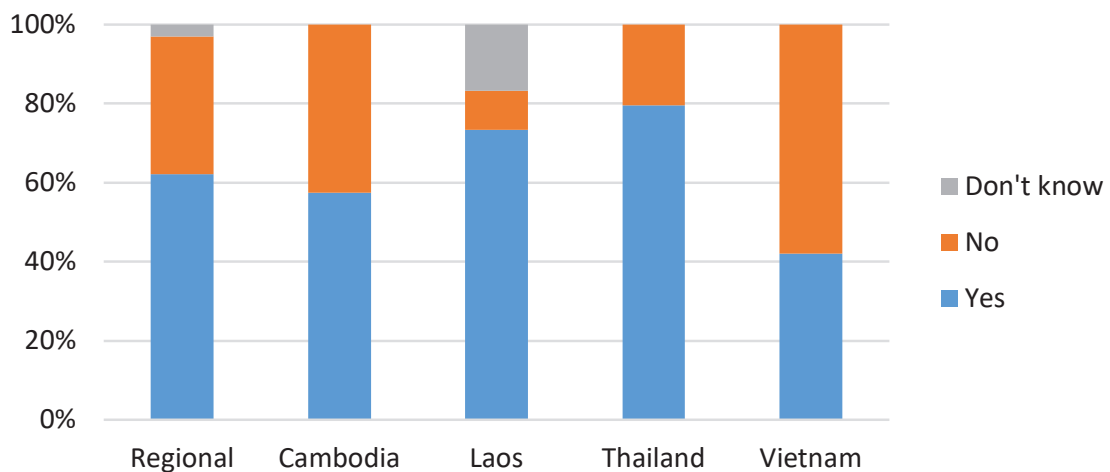
Figure 12. Experience of losses and damages from flooding, by village, in the last three years

Similarly, in the last 12 months, around 67% of sample villages experienced losses and damages from flooding. Thailand had the highest portion at 87.2%, while Viet Nam had the lowest proportion at 42% (Figure 13).
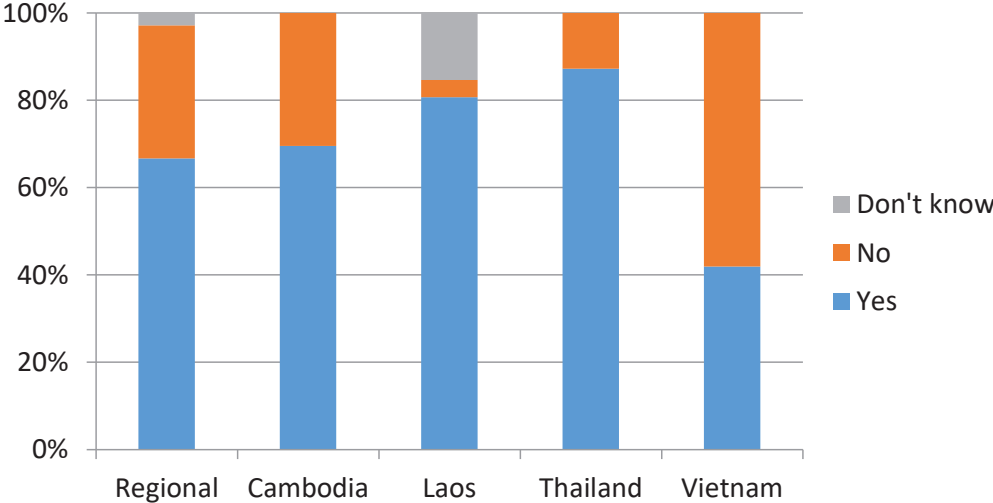
Figure 13. Experience of losses and damages from flooding by village in the last 12 months

Table 11 shows that short-term floods (i.e. that last less than two weeks) mostly damaged areas of 3–5 ha, with 34 villages reporting, while the long-lasting floods (i.e. that last more than two months) and flash floods mostly damaged areas of less than 1 ha (with 29 villages reporting).

Table 11. Area damaged by flooding, by number of villages and duration, in the last 12 months

	Less than 2 weeks	2 weeks to 1 month	1 month to 2 months	More than 2 months	Flash floods
Less than 1 ha	29	29	29	29	29
1–2 ha	16	28	48	0	8
3–5 ha	34	25	34	3	3
5–10 ha	16	35	39	10	0
More than 10 ha	13	24	54	9	0

According to Figure 14, the main consequences of serious flooding in the last 12 months were river overflow (56% of villages reported) and rainwater not being able to drain away (55% of villages reported). Lao PDR had the highest percentage of villages that considered river overflow as a major impact of serious flooding (84%), followed by Thailand (68%). Rainwater that could not be drained away was mostly reported by the villages in Thailand (82%) (Figure 14).
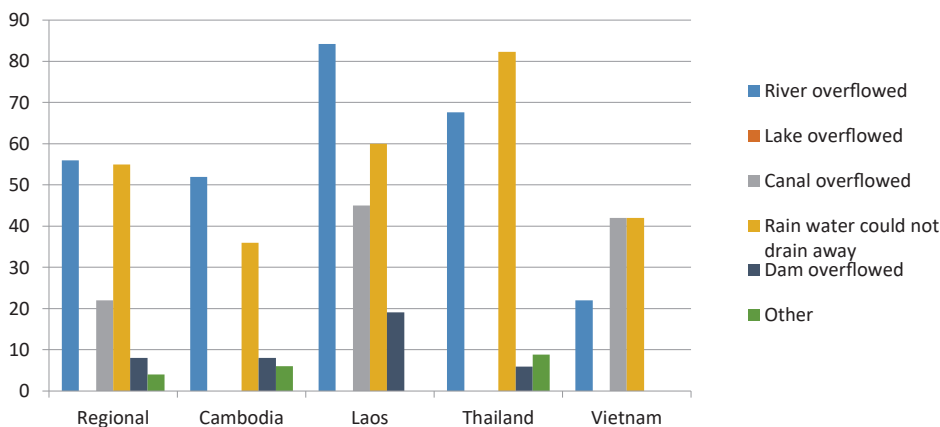
Figure 14. Causes of most serious flooding in the last 12 months (%)

In the last 12 months, normal rains/monsoons were considered the main source of flooding in the region (34% of villages), which was very common in Thailand (79%) and less common in Lao PDR (16%). Extended monsoon was the second most common source of flooding and was reported by 20% of villages, mostly in Lao PDR (52%). Extreme weather/typhoons and man-made causes (release of hydropower reservoirs) were reported by only around 10% of villages (Figure 15).
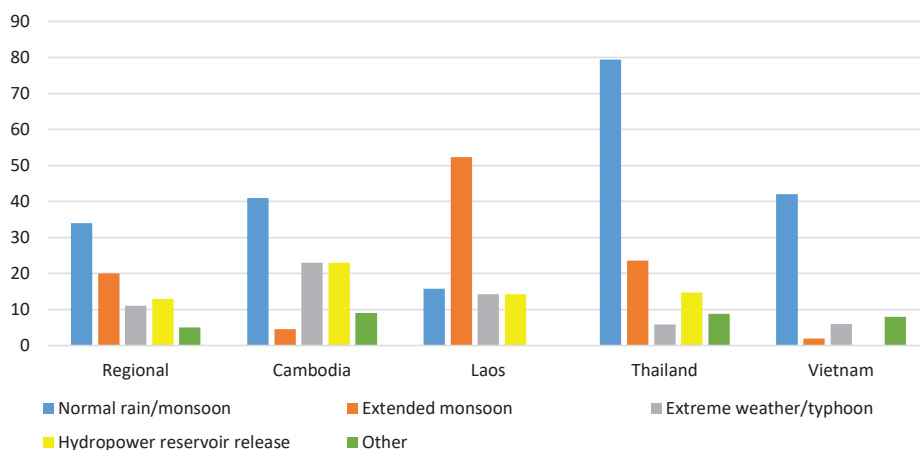
Figure 15. Main causes of flooding in the last 12 months (%)

Figure 16 shows that in around 25% of villages the impacts of flooding had become much worse, and in 25% of villages, it was worse in the last 12 months compared to earlier years. In only 15% of the villages, the floods were the same. Moreover, 18% of villages reported that the impacts were less, and only 3% of villages that the impacts were much less. Also, 63% of villages experienced loss of animal assets from flooding in the last 12 months: Thailand experienced more loss (nearly 100%) and Viet Nam experienced less (42%) (Figure 16).
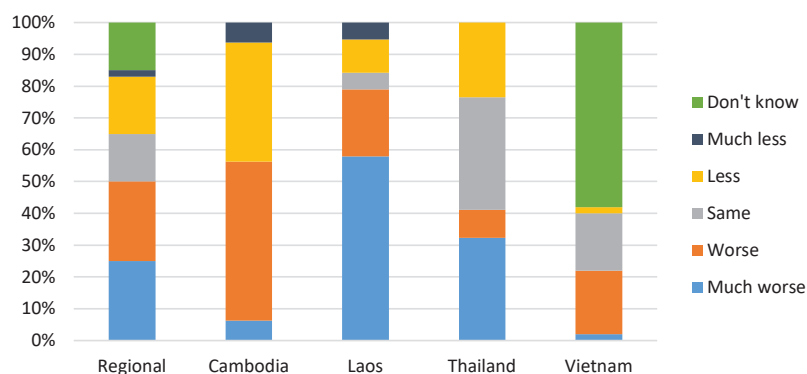
Figure 16. Trend in impacts of flooding

Table 12 revealed that flooding mostly caused losses and damages of cropland, houses, and aquaculture.

Table 12. HHs that experienced losses (L) and damages (D) in the region (no. of villages reported)

	2 or less HHs			3–5 HHs			6–10 HHs			10–30 HHs			> 30 HHs			Total
	L	D	L&D	L	D	L&D	L	D	L&D	L	D	L&D	L	D	L&D	
Cropland	18	4	2	3	15	7	6	12	10	12	18	4	23	13	2	149
Houses	11	2	0	0	1	0	11	2	0	0	0	0	0	1	0	28
Aquaculture	0	1	0	2	3	0	2	1	0	3	2	0	0	1	0	15
Human life	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cattle	0	0	0	4	1	0	1	1	0	2	2	0	0	0	0	11
Buffalo	1	0	0	3	0	0	1	1	0	0	2	0	0	0	0	8
Pigs and goats	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
Chicken and ducks	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	2
Other	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2
Total	30	8	2	13	20	7	21	18	10	21	24	4	23	15	2	
By HH	40			40			49			49			40			

3.7.2   Losses and damages by drought

An average 61% of villages experienced losses and damages from drought in the last three years. The highest percentage of losses and damages was 76% in Cambodia, followed by Thailand at 67%. Viet Nam had the lowest percentage, at 50% (Figure 17).
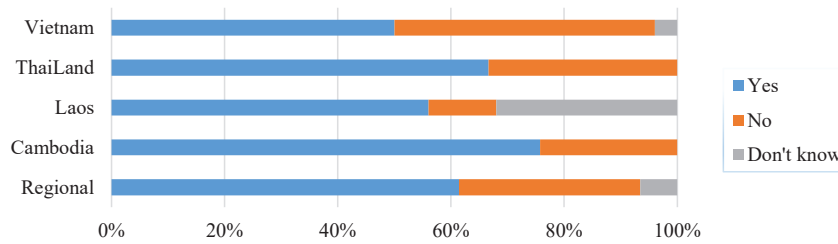
Figure 17. Experience of losses and damages from drought by village in the last 3 years

In the last 12 months, the duration of drought was typically from 1 to less than 2 months in Lao PDR and Viet Nam (over 70% of villages reported), while 2 up to 3 months was more common in Cambodia and Thailand (around 45% of villages reported) (Figure 18). The Annual Report 2019 conducted by MRC also strongly indicates that the LMB corridor is currently at high risk of drought, and the trend is that the risk will increase, as evidenced by the increasing intensity and duration of the droughts that occurred in the past two decades.
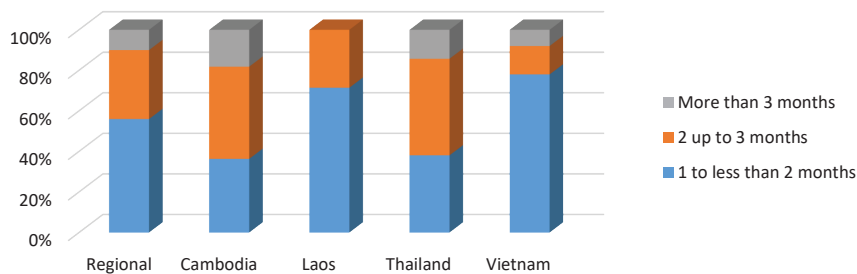
Figure 18. Experience of drought in the last 12 months (%)

Figure 19 shows that the major causes of drought were extreme weather/climate change (reported by 43% of villages), following by extended dry season (42%). This is further indicated by the findings of several climate change studies by the MRC and other organizations showing that the LMB corridor is likely to see more severe droughts in the next 30 to 90 years due to less precipitation, high air temperatures, and high evapotranspiration combined with increasing demand for water as a result of the growing population in the basin (MRC, 2019).
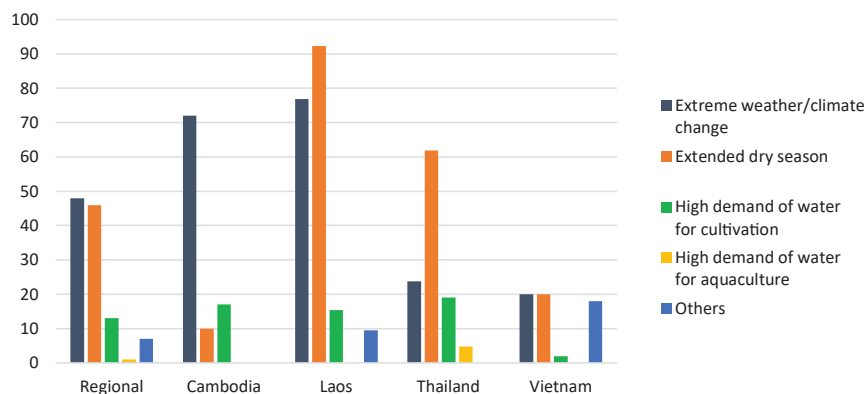
Figure 19. Causes of drought (%)

Regarding the impacts of drought at the village level, 39% of respondents did not answer; 23% of thought that the impacts were worse, most of them were Thai HHs (52%). About 14% of respondents reported that the impacts of droughts were the same as in previous periods (Figure 20).
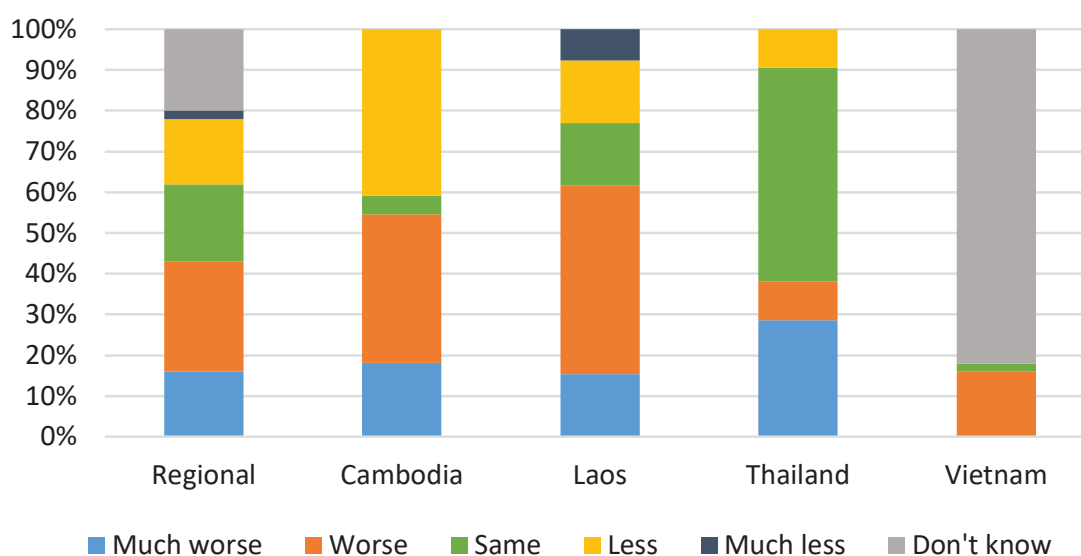
Figure 20. Trends in the impacts of drought

3.7.3   Losses and damages by saline intrusion

Saline intrusion has impacted the Vietnamese only, where 27 out of 50 villages experienced salinity intrusion in the last three years. In addition, 4,456 HHs experienced salinity intrusion in the last three years. The latest drought occurred from January to May, particularly in February and March, where a total of 4,060 HHs in 24 villages were impacted by salinity intrusion

Nine villages experienced salinity intrusion in the last 12 months. The duration of the most severe salinity was one to three months. Compared to earlier years, 10% of respondents stated that the impacts of the most severe salinity intrusion in the last 12 months were worse, and 10% of villages reported that they were the same.

3.8   The adaptation of villages to climate change

Villages in the four countries took actions to deal with the impacts of climate change. At the regional level, 66% of villages took action to cope with climate extreme events. Viet Nam had the highest rate, at 88%, whereas Cambodia was the lowest, at 42%.

Sample villages adopted numerous strategies, both structural and non-structural measures, to cope with the impacts of climate changes (Figure 21). The most common adaptation activity was awareness raising (60%), which prevailed in Viet Nam, at 98%, followed by Thailand, at 72%. The second main adaptation measure was building dykes and organizing communities around adaptation (20%). Changing crops or crop patterns was selected by 17% of villages. Non-structural measures were adopted by villages more than structural measures, at 67% and 26%, respectively. Moreover, 128 out of 200 villages integrated climate change adaptation into their development plan; Viet Nam had the largest number, with 41 out 50 villages.
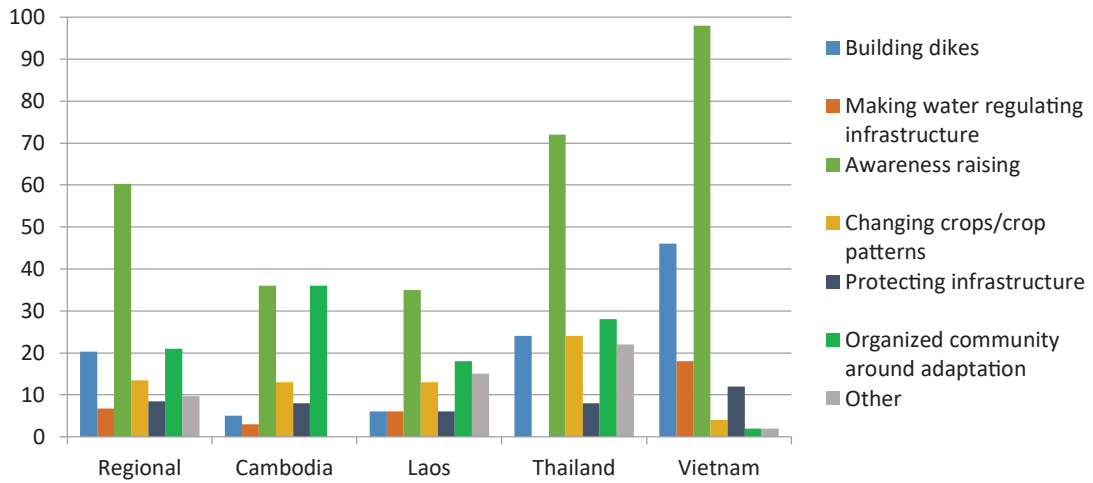
Figure 21. Adaptation activities carried out (%)
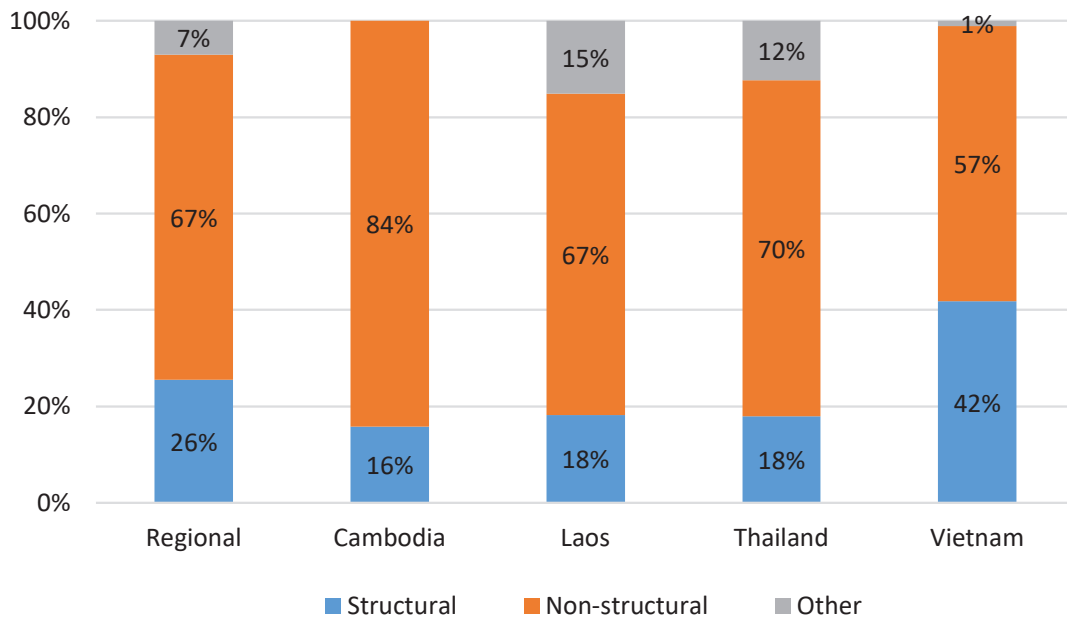
Figure 22. Adaptation activities by structural or non-structural measures (%)

■■■■ THE HH SURVEY

4.1 Demographic and education characteristics of HHs

4.1.1 Demographic characteristics of HHs

HH's demographic characteristics including HH size, age of head of HH, sex of head of HH, sex ratio, and dependency rate can be considered proxy indicators for family structures and, by extension, the level of socio-economic development.

The average HH size in the survey area was five persons. Lao PDR had the largest HH size, with six, followed by Cambodia with 5; Viet Nam and Thailand had the lowest HH size, with 4 each. Thailand and Viet Nam had the highest average age of the head of HH (8 and 57), respectively. The age of the head of the HH in Cambodia and the Lao PDR was lower, at 54 and 47, respectively.

Thailand had the highest percentage of female head of HH, at 29.2%, followed by Lao PDR, at nearly 20%. Cambodia and Viet Nam had a lower percentage of female heads of HHs, at nearly 18% and 13%, respectively (Table 13).

Table 13. Demographic characteristics of HHs, by country

	Unit	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
HH size	people	5	5	6	4	4
Age of head of HH	Year	54	47	54	58	57
Female heads of HHs	%	15.8	18.5	19.7	29.2	12.8
% females out of total HH members	%	49.5	50.6	50.1	47.7	49.5

The "dependency ratio" is the ratio of number of HH members at the working age members who are considered too young (below 15 years) or too old to work (above 64 years). A high dependency ratio indicates a general vulnerability that also applies to a decrease in natural resources, if reliance on these resources is high. For example, if a HH member has to provide for five young and old people in a HH, for example, from fishing, the HH will be more vulnerable to a reduction in fish resources, especially if the person has no other skills or options. The dependency ratio was highest in Lao PDR, at 53.8%, followed by Cambodia and Thailand, at 35% and 36%, respectively (Figure 23). This correlates with high fertility rates and relatively large HHs, indicating more traditional, extended family structures. HHs in Viet Nam had the lowest dependency ratio (27%), reflecting a more advanced stage in the demographic transition towards modernization. The data from the Mekong Delta could be interpreted as showing a stage in the transition from traditional, extended families to modern, nuclear families.
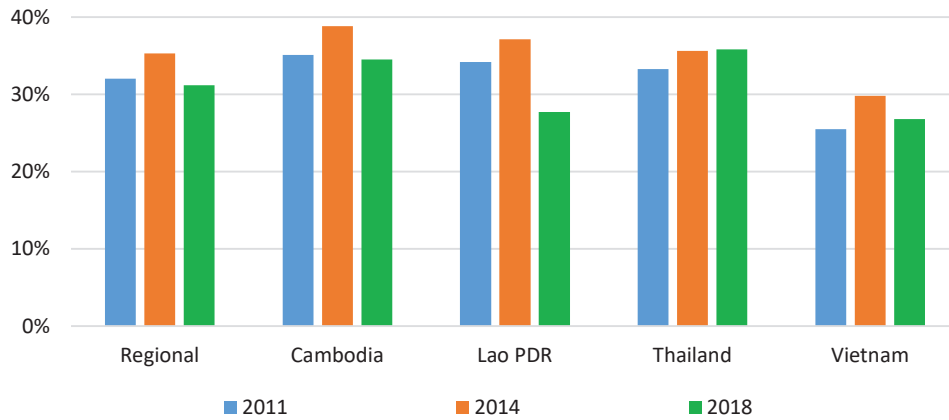
Figure 23. Dependency ratio in 2011, 2014 and 2018, by country (%)

According to Figure 23, in 2011 and 2018, dependency ratios in all countries except Cambodia had an increasing trend; Lao PDR experienced the highest increase, at almost 20%.

Correlation between ethnicity and vulnerability is complex because the LMB corridor has many ethnic groups of different sizes. In general, it is assumed that smaller ethnic groups, often living in remote areas, are more vulnerable to changes in access to natural resources on which their livelihoods depend. Other ethnic groups base their livelihoods on a specialized niche of resource exploitation, which makes them vulnerable to changes in that specific niche. Some ethnic groups in the LMB corridor do not have equal access to education. There were four large groups – the Khmer in Cambodia (88%), Kinh in Viet Nam (91%), Lao Isan in Thailand (71%), and Lao in Lao PDR (72%). In addition, there were other smaller ethnic groups – including the Khmou, Tai Lue, Suay, Cham, Chinese, Hmong, Lu Mien, Kaloeng, Lahu, Lamet, Nyo, Phou Thay, Phuan, Ta-oy, and Tai.

4.1.2 The marital status and education level

The general education level is an indicator of resilience and ability to adapt to changing circumstances. The proportion of heads of HHs that have completed upper secondary school or higher levels was still low, at around 10% (Figure 24). This suggests that HHs in these countries were more vulnerable to changes in natural resources and weather patterns.
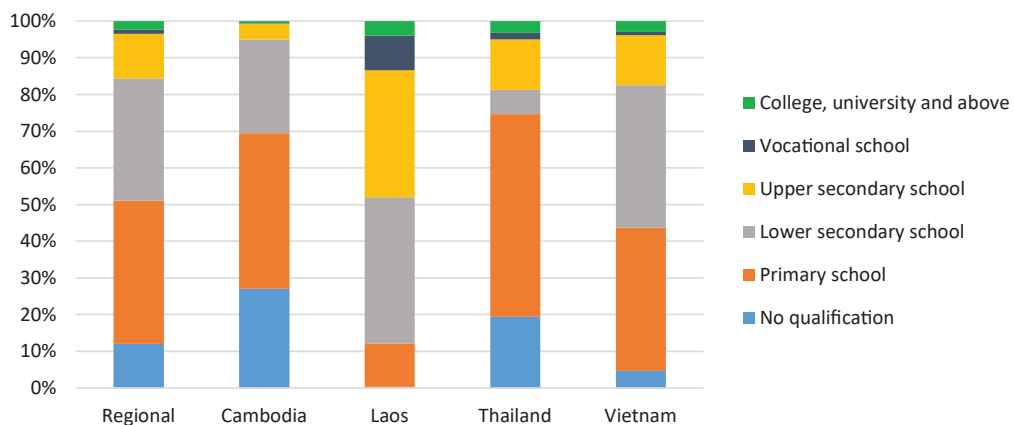
Figure 24. Education levels of head of HH (%)

35

In all four countries, the main marital status of HHs was married, at above 77%, and the least common was separated , at under 1% (Figure 25).
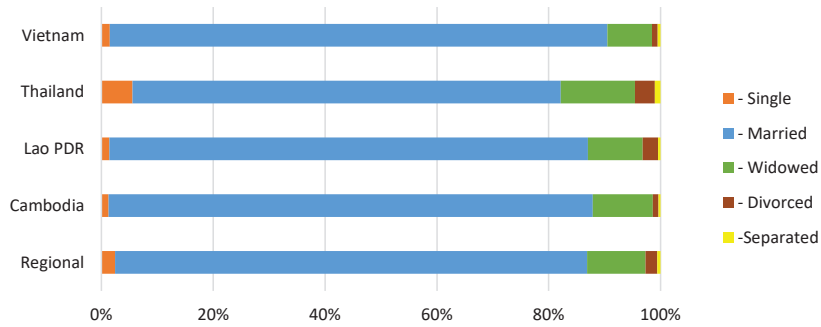
Figure 25. Marital status of head of HH (%)

4.2 HH livelihood activities

4.2.1 HH livelihood activities

In 2018, the HH survey collected data on the most and second most important livelihood activities: in general, crop farming was still the most important (46%) and also the second most important occupation (16%). Other water resource-related livelihoods accounted for a small portion. Fishing was the most important livelihood for only 3% of the HHs and the second important activity for only 4%. Regarding other water resource-dependent occupations such as collection of OAAs/Ps, fish processing, aquaculture, navigation and sand mining from the river, each of these was the most or second most important activities for less than 1% of HHs. It emerges from comparing the 2014 and 2018 surveys that crops farming gradually decreased its prevalence as the most important occupation as the percentage of HHs that reported crop farming as the main livelihood decreased significantly, from 69% to 46%, while it increased as the second most occupation, from 9% to 16% (Figure 26).
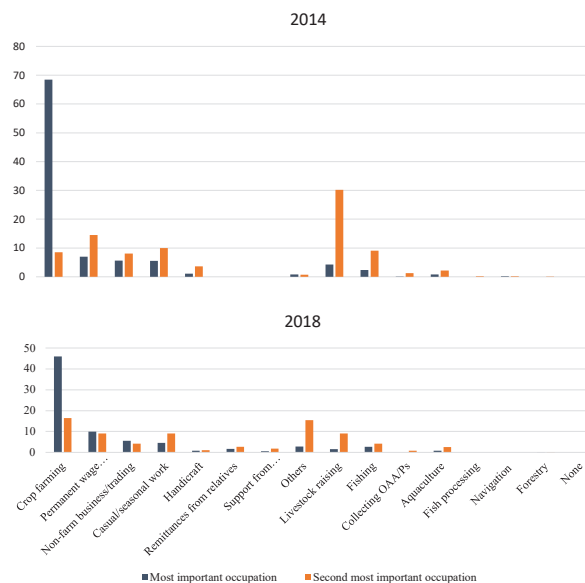
Figure 26. Comparison of the most and second most important livelihood activities in the past 12 months, 2014 and 2018

At the national level, crop farming was equally important in the four countries, while permanent wage employment, non-farm business/trading and aquaculture were dominated by Vietnamese HHs (53%, 41% and 96%, respectively. Collecting OAAs/Ps and support from the government were dominated by Thai HHs, while handicrafts and fishing were dominated by Cambodian HHs.

From 2011 to 2018, fishing as the most important livelihood in Cambodia and Viet Nam increased significantly and decreased slightly in Thailand (Figure 27).
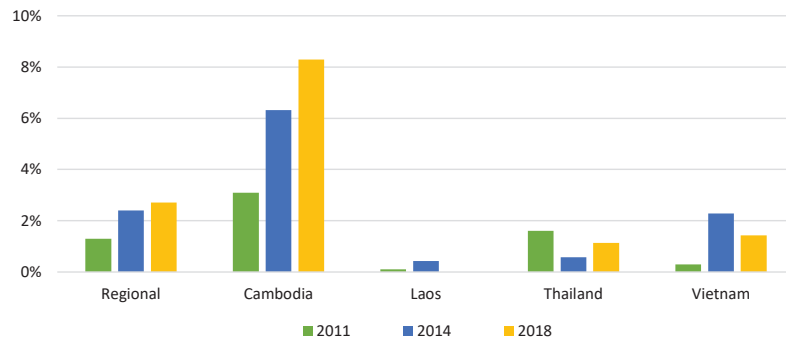
Figure 27. Percentage of HHs whose most important livelihood is fishing, 2011, 2014 and 2018

Regarding the option of fishing as the second most important activity for livelihood, the figure for the whole region fluctuated with an increasing trend from 2011 to 2014, but a decreasing trend from 2014 to 2018 (Figure 28).
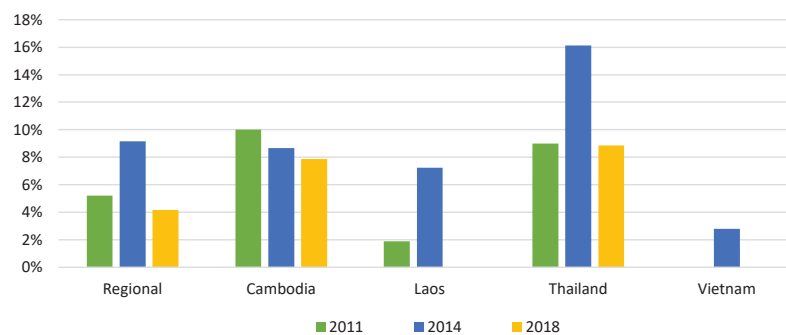
Figure 28. Percentage of HHs whose second most important livelihood is fishing

4.2.2   Water resource-related livelihoods

In this section, the HHs were asked if any HH member had been engaged in various water-related livelihood activities, such as: (i) fishing; (ii) collecting OAAs/Ps; (iii) aquaculture; (iv) irrigated farming; (v) non-irrigated farming; and (vi) riverbank cultivation. Table 14 shows that non-irrigated farming was the most important activity in Cambodia (56.1%) and Thailand (74.1%); fishing was also important to HHs in Cambodia (44.3%) and Thailand (47.1%); irrigated farming was the most common livelihood in Viet Nam (63.3%) and Lao PDR (40%); and collecting OAAs/Ps was the most common water-related livelihood in Thailand, at 50%.

Table 14. Engagement of HH member in water-related livelihood activities in the last 12 months in 2018 (%)

No.	Livelihood activities	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
1.	Fishing	30.0	44.3	17.0	47.1	11.6
2.	Collecting OAAs/Ps	21.7	21.0	4.7	50.0	11.0
3.	Aquaculture	11.7	2.0	15.1	20.4	9.3
4.	Irrigated farming	34.3	15.3	40.0	18.6	63.3
5.	Non-irrigated farming	38.0	56.1	13.3	74.1	8.3
6.	Riverbank cultivation	3.6	3.1	2.9	6.3	2.1
7.	Other	0.5	1.3	0	0.3	0.3

In general, the percentage of HHs with members who fished in the last 12 months decreased from 2011 to 2018. The figure for Viet Nam was low (around 10%) and had a decreasing trend in the three survey years (Figure 29).
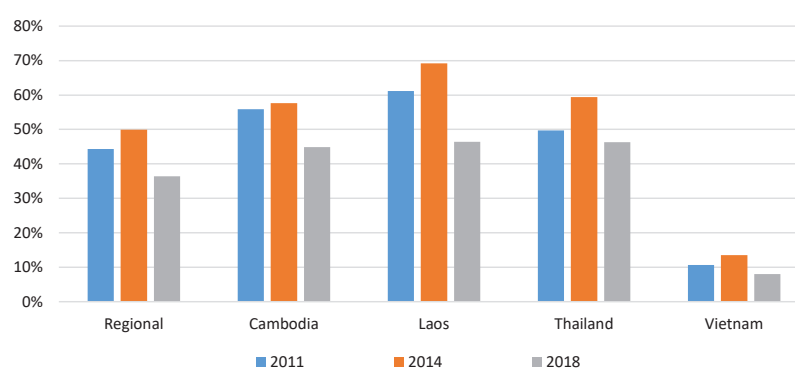
Figure 29. Percentage of HHs that fish, 2011, 2014 and 2018

Similarly, the percentage of HHs with members who collected OAAs in the last 12 months decreased in the survey period; for the lowest percentage continued to be in Viet Nam (Figure 30).
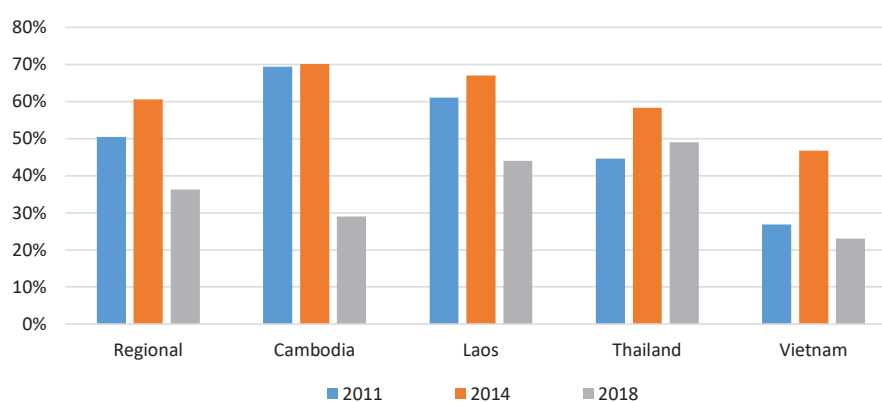
Figure 30. Percentage of HHs collecting OAAs, 2011, 2014 and 2018

4.2.3   Occupation or livelihood changes in the last five years

According to the results of the 2018 survey, a small portion of HHs (only 5.4%) shifted their livelihoods because of declined productivity in natural resources such as fish, other aquatic animals, or collected plants. Table 15 shows options in the four countries for changing occupation or livelihood activities in the last five years. Shifting to crop farming was main by Cambodia and Thailand, whereas shifting to livestock farming was most common in Lao PDR. These figures indicate that changes in occupation or livelihood activities were still limited in the last five years (Table 15).

Table 15. Occupation or livelihood changes in the last five years (% of HH)

No.	Changing options	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
	First option					
1	Shift to fishing	0.1	0.1	0.4	0	0
2	Shift to livestock farming	0.8	1.3	1.3	0.6	0.1
3	Shift to crop farming	1.5	1.7	1.0	2.3	1.0
4	Shift to aquaculture	0	0	0	0	0.1
5	Shift to locate employment	1.1	1.4	1.3	0.7	0.9
6	Migrate	0.3	0.9	0.3	0.1	0
7	Start a business	0.5	0.6	0.4	0.9	0
8	Other	1.0	0.6	0.4	2.4	0.7
	Second option					
1	Shift to farming	0.6	1.3	0.3	0.1	0.6
2	Shift to aquaculture	0	0	0.1	0	0
3	Shift to local employment	0.5	0.1	1.0	0.1	0.7
4	Migrate	0.3	0.7	0.4	0	0
5	Start a business	0.2	0.1	0.1	0.1	0.3
6	Depend on help from others	0.1	0.1	0	0	0.3
	Third option					
1	Shift to local employment	0.1	0	0.3	0	0
2	Borrow money	0	0.1	0	0	0
3	Start a business	0.1	0.1	0.1	0	0
4	Other	0.3	0	0.1	0	0.9

4.3   HH income and assets

The results from the survey show that business was largest income source in the region ($470), followed by rice sales ($350) and full-time employment ($341/HH). At the country level, business was the largest income source in Cambodia, followed by the sale of other's fish catch ($479/HH). The most and second most important income sources were business and full-time employment in Lao PDR; sale of rice and of other crops in Thailand; and full-time employment and the sale of rice in Viet Nam (Figure 31).
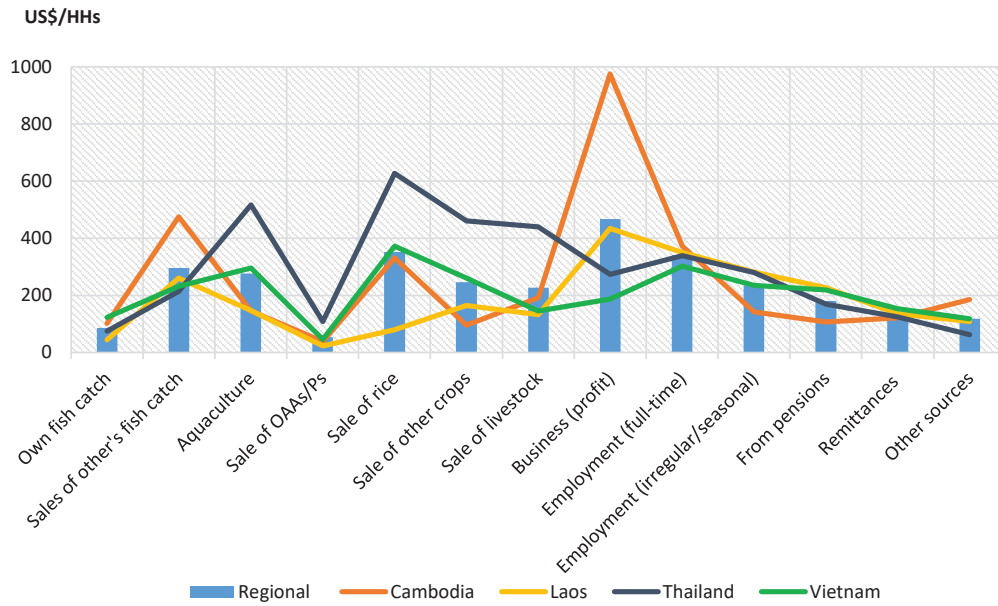
Figure 31. HH income during the last month by source (US$/HH)

Regarding sources of HH income during the last year, full-time employment generated the largest income ($3,736/HH), followed by business ($2,880) and aquaculture ($2,094). The largest income source was sale of others' fish catch ($4,883) in Cambodia; business ($4,537) in Lao PDR; full-time employment ($3,670) in Thailand and aquaculture ($5,395) in Viet Nam (Figure 32).
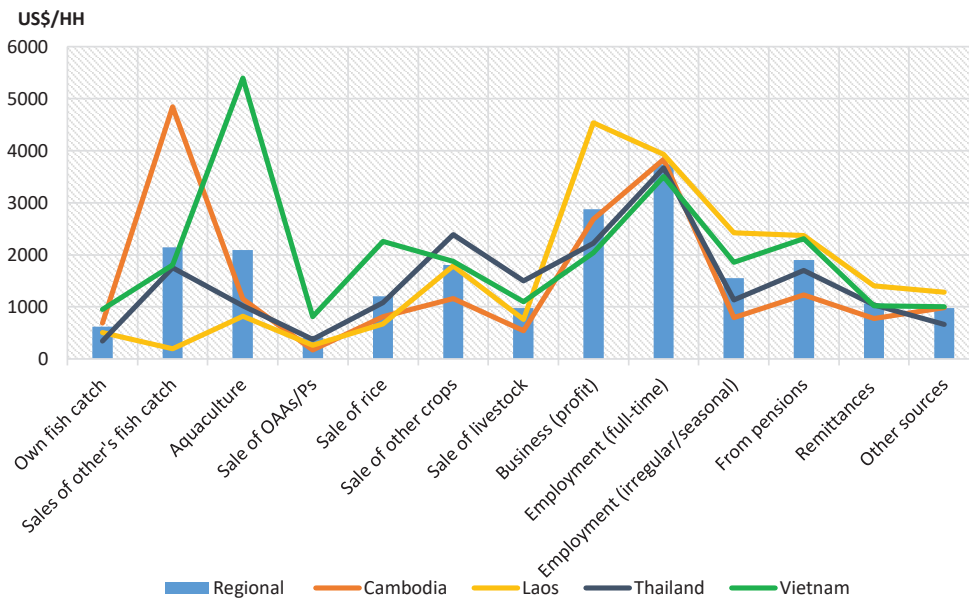
Figure 32. HH income during the last year by source (US$/HH)

The income trend of selected HHs compared to five years ago is presented in Table 16: 35% of HHs reported that their income was lower; 32% that it was the same; just 26% said that it was slightly more; and 6% of HHs that it was much more. Around 22% that the income changes related to changes in water resources (Table 16).

Table 16. Income changes compared to five years ago (% of HHs)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Lower	35.4	28.9	21.1	50.9	40.6
The same	32.3	21.3	29.0	32.6	46.1
Slightly more	25.7	42.1	35.6	14.3	10.9
Much more	6.4	7.3	13.9	2.3	2.0
Don't know	0.3	0.4	0.1	0.0	0.4
Reason for the income changes related to changes in water resource	22.0	9.0	18.4	30.1	30.3

The HH income per capita from fish sales in last month of the 2011 and 2018 surveys decreased significantly (Figure 33). Fish resources likely changed in the period (Figure 33).
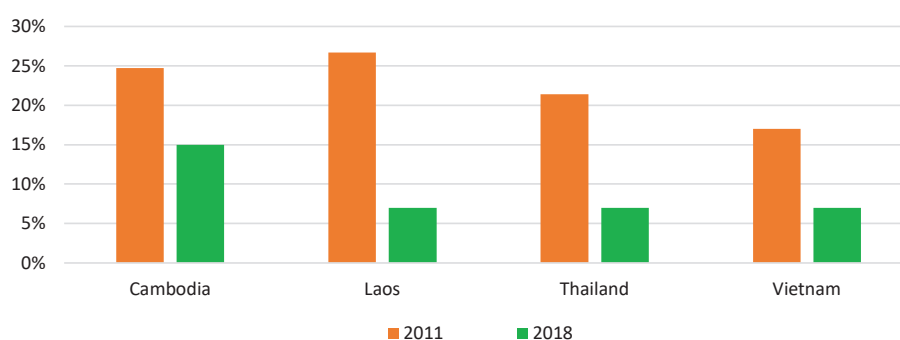
Figure 33. Income per capita from fish sales (last month), 2011 and 2018 (% of HHs)

Compared to 2011, the percentage of HHs that had income from OAAs dropped except in Thailand. Cambodia and Lao PDR had the highest reduction (Figure 34).
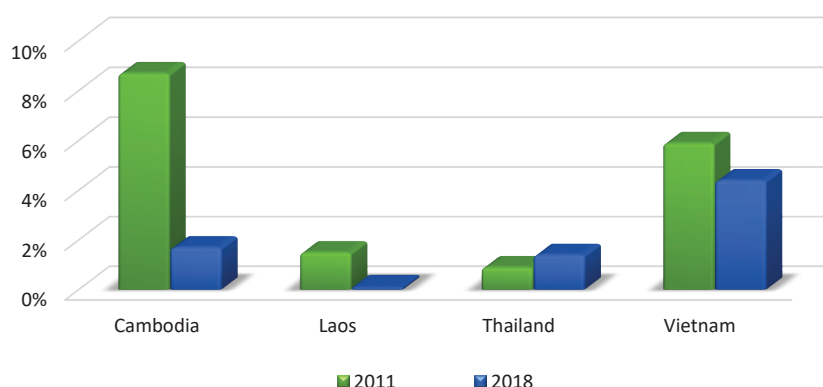
Figure 34. Percentage of HHs with income from OAAs

Table 17 presents the means of assets of selected HHs: common assets were TV, mobile phones, motorbikes and water tanks. For the whole region, the mean residential land area per HH was about 802 m2. The largest area was in Cambodia, at 1,244 m2 and the smallest in Viet Nam, at 290 m2.

Table 17. Types of HH assets

No.	Items	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
1	TV	1.2	1	1.3	1.3	1.1
2	Mobile phone	2.6	2	3.4	2.5	2.5
3	Computer	1.3	1.1	1.5	1.3	1.2
4	Fridge	1.2	1	1.2	1.2	1.1
5	Washing machine	1.1	1	1.1	1.1	1
6	Electric cooker	1.1	1.1	1.2	1.1	1.1
7	Motorbike	1.8	1.3	1.9	1.7	2
8	Car/truck	1.3	1.1	1.4	1.3	1.3
9	Tractor	1.1	1	1	1.1	1.3
10	Ox cart	1.2	1	1.1	1	1.5
11	Boat with no engine	1.1	1.1	1.1	1.1	1.1
12	Boat with engine	1.2	1.1	1.2	1.3	1.2
13	Fish equipment	17.1	26.9	3.7	22.5	1.8
14	Water tank	1.9	1.5	1.7	2	2.4
15	Pumping machine	1.2	1.2	1.1	1.2	1.2
16	Rice mill	1	1	1	1	1
17	Thresher	1.6	1.3	1.7	1.8	1.5
18	Cattle/buffalo	5.4	3.4	7.6	5.4	3.7
19	Pigs/goat	10.8	2.9	6.8	54.7	18.4
20	Poultry	28.7	15.8	31.2	24.5	55.5
21	Residential lands (m2)	802.5	1243.6	933.9	754.5	289.6
22	House	1.1	1	1.2	1.1	1.1

4.5 HH vulnerability

The availability of a drinking water supply is a vulnerability indicator in SIMVA 2018 and a measure of access for HHs to safe drinking water. Drinking water mostly came from bottled water (50%), followed by piped water (33%). Bottled water and rivers were the most common source of drinking water in Cambodia (21% and 20%); bottled water in Thailand and Lao PDR (79% and 86%, respectively); and piped water in Viet Nam (67%) (Figure 35).
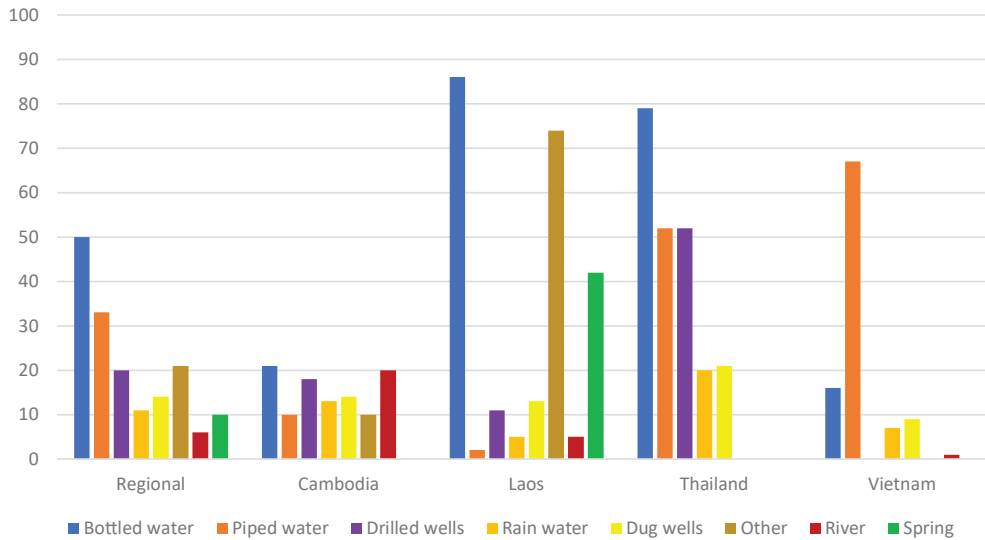
Figure 35. Sources of drinking water

Compared to 2011, sources of drinking water changed significantly in 2018. Other sources in 2018 included purchased sources such as bottled water, which accounted for a large portion of water sources used in almost all of the countries.
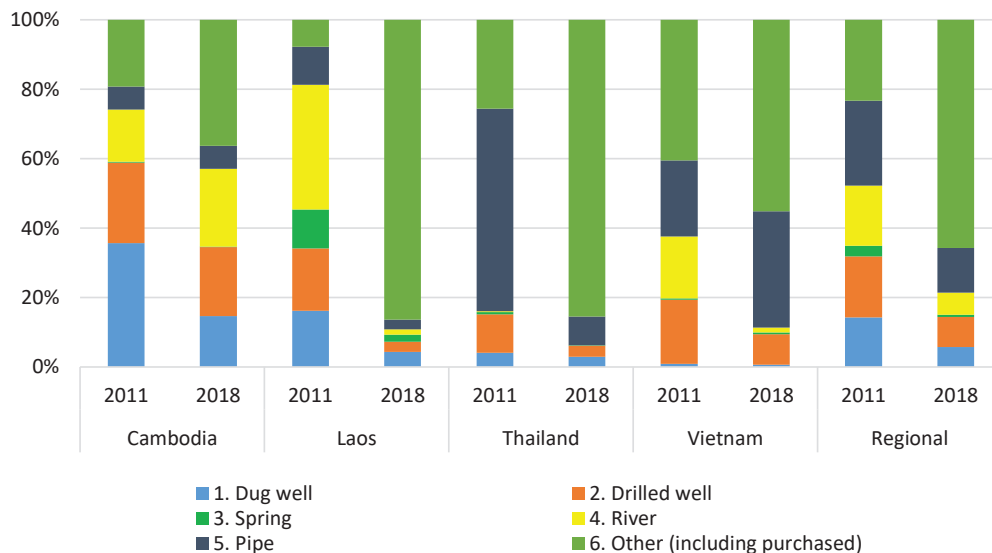
Figure 36. Sources of drinking water, 2011 and 2018

In general, HH dependence on water drawn from the Mekong River for irrigation decreased from 2011 to 2018. Viet Nam had the highest dependence of all countries (Figure 37).
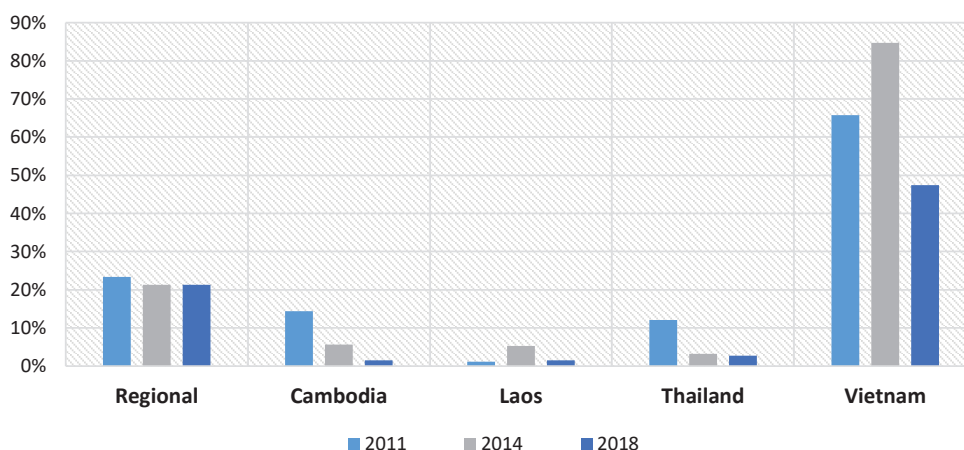
Figure 37. Percentage of HHs that depend on water drawn from the Mekong for irrigation, 2011, 2014 and 2018

As shown in Table 18, boiling was the most common treatment for drinking water, at 45.2% of HHs indicated. Another measure was filter or chemicals, with 14% of HHs. Moreover, 92.1% of HHs used national grid electricity for lighting. Only 4.2% of HHs used batteries, generators, or small-scale hydro-electricity, and most were Cambodian. Gas and oil lamps were less common (0.7%).

The highest percentage of HHs had private, traditional toilets (43.4%): 28.6% had private clean modern toilets, and only 8% of HHs had no toilets, mostly in Cambodia.

The percentage of HHs considered officially poor by the government was 25.6%. Most of HHs indicated that they had enough food during the last 12 months (93.9%) and had over two meals per day (85%).

In addition, 18.4% of HHs received support for the poor and 13.8% of HHs received disaster support. Thai HHs received the largest support (64.4% and 37.9%, respectively). In contrast, Vietnamese HHs received less support (2.1% and 1.1%, respectively).

Table 18. HH characteristics during the last 12 months (%)

		Regional	Cambodia	Lao PDR	Thailand	Viet Nam
1. Sickness in the HH	HHs have a sick member	41.9	35.1	46.7	41.7	44.1
2. Treatment for drinking water	Boiling	45.2	62.7	30.3	8.1	79.6
	Filter or chemicals	14	24.4	7.3	12.9	11.3

3. Lighting	National grid electricity	92.1	72.7	96.1	99.9	99.6
	Battery or generator or small-scale hydro-electricity	4.2	14.7	1.6	0	0.4
	Gas and oil lamps	0.7	1.0	1.6	0.1	0
	Others	3.0	11.6	0.6	0	0
4. Toilet	Private, clean modern toilet	28.6	0	14.6	35.0	64.7
	Private traditional toilet	43.4	0	77.9	64.7	31.0
	Shared toilet with others	2.3	8.0	0.3	0.1	0.9
	Have no toilet	8.0	21.1	7.1	0.1	3.4
	Yes, private (Cambodia without separating modern and traditional)	17.7	70.9	0	0	0
5. Considered officially poor by the Government		25.6	19.7	6.4	66.4	9.9
6. Had enough food during the last 12 months		93.9	94.9	91.1	92.3	97.4
7. How many meals does the HH have per day on average	One meal per day	0	0	0	0.1	0
	2 meals per day	15.3	20.6	0.6	3.3	36.9
	Over 2 meals per day	84.6	79.4	99.4	96.6	63.1
8. HH received support during the last 12 months	Support for the poor	18.4	3.0	3.9	64.4	2.1
	Disaster support	13.8	6.9	9.3	37.9	1.1
9. HH have a bank account		41.6	12.7	30.4	94.4	28.9

Forty-two percent of HHs had a bank account, most of which were Thai HHs (57%). The most common loan sources came from commercial banks (48%), followed by source from the government (39%). Only 5% of HHs received loans from private lenders, and most of which were Cambodian HHs.
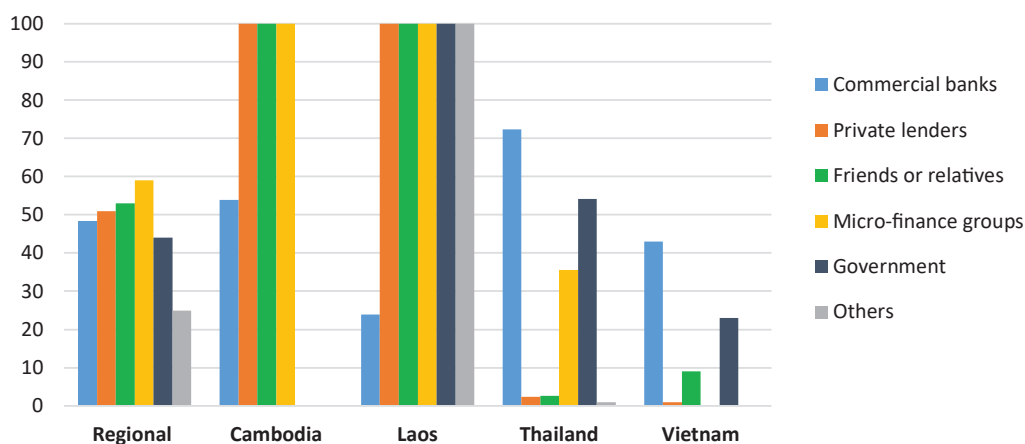
Figure 38. Source of loan (% of HHs)

4.6 Agriculture, fisheries, and OAAs/Ps collection

4.6.1 Agriculture

This section presents the result of survey on the agriculture activities of HHs: 77.5% of HHs were engaged in agricultural activities during the last 12 months; 57.6% were engaged in rice cultivation; just 4.7% cultivated industrial crops; and only 3.7% cultivated vegetables (Table 19).

About 52% of HHs used rainwater for agricultural, 17.3% used irrigation water from the Mekong River, and 15.7% of HHs used pumped water from another surface water source; only 12.1% of HHs cultivated in riverbanks, island gardens and fields (Table 19).

Table 19. Agricultural activities of sample HHs in the last 12 months (%)

		Regional	Cambodia	Lao PDR	Thailand	Viet Nam
1	HHs cultivated crops	77.5	76	77.9	84	72.3
	Important crops					
	Rice	57.6	71	60	58	41.4
2	Vegetables	3.7	1.3	8.4	1.7	3.4
	Industrial crops	4.7	2.4	6.6	9.6	0.1
	Other					
	11.6	1.3	2.9	14.7	27.6	
	Various sources of water for cultivation					
	Pumped water from the Mekong River	4		4	1.6	6.4
3	Pumped water from other surface water sources	15.7		5.1	16.5	25.6
	Irrigation water from the Mekong River	17.3		1.6	2.7	47.4

	Irrigation from other surface water sources	9.6		12.4	13.9	2.4
	Pumped water from wells	3.4		1.7	5.4	3.1
	Rainwater	52		66.3	66.2	23.4
	Other	8		14.7	7.3	1.9
4	HHs cropping in riverbanks, island gardens and fields	12.1	4.1	19.9	6.4	18.1

Over the period of seven years, from 2011 to 2018, in Cambodia and Thailand, the percentage of HHs that had riverbanks, island gardens and fields decreased, but increased in Lao PDR and Viet Nam. In 2018, in Lao PDR and Viet Nam, around 20% of HHs had riverbanks, island gardens and fields , followed by Thailand, at 7%. Cambodia had the lowest percentage, at only 4% (Figure 39).
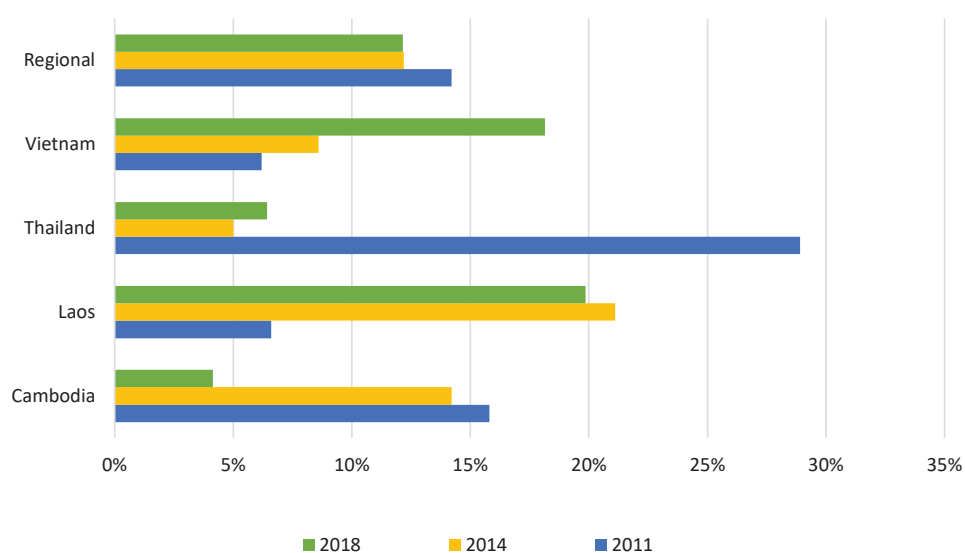
Figure 39. Percentage of HHs with riverbank cultivation, 2011, 2014 and 2018

4.6.2 Fisheries

According to the 2018 survey, around 38% of HHs were engaged in fishing in the last 12 months, of whom 30% were in Cambodia, 31% in Lao PDR and Thailand, and only 9% in Viet Nam.

Figures 40–43 show the percentage of HHs that had members who fished in the different habitats over the year.

In Cambodia, the main fishing habitats throughout the year were other rivers and the Mekong mainstream. The rice field was the second most important habitat from June to December. The Mekong mainstream was the main fishing habitat from March to December, while ponds were the main fishing habitat from June to April. Tonle Sap Lake was also a common fishing area throughout the year (Figure 40).
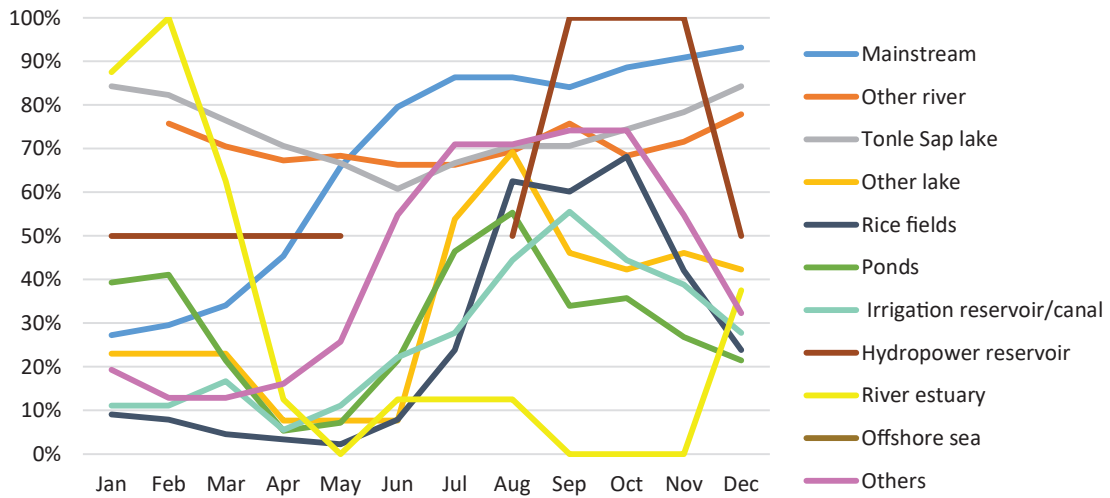
Figure 40. Fishing habitat by month in Cambodia

In Lao PDR, the Mekong mainstream and other rivers were the main fishing habitats of local people in the sample areas, whereas the mainstream was the main fishing habitat in the period from February to July, and 'other rivers' was the most fished habitat from May to October. Rice fields and ponds were also common habitats for fishing from April to October.
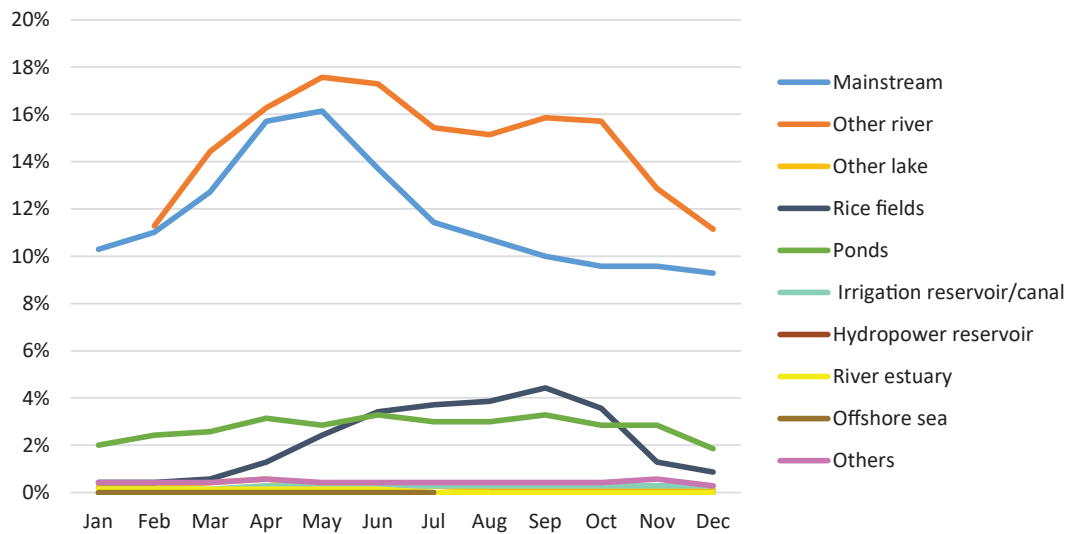
Figure 41. Fishing habitat in Lao PDR, by month

In Thailand, other rivers were the main fishing habitat, particularly from June to December. Ponds were the second main habitat for the whole year. Other habitats such as rice fields, the Mekong mainstream, other lakes/wetlands, and irrigation reservoirs/canals, etc. were less common but stable throughout the year.
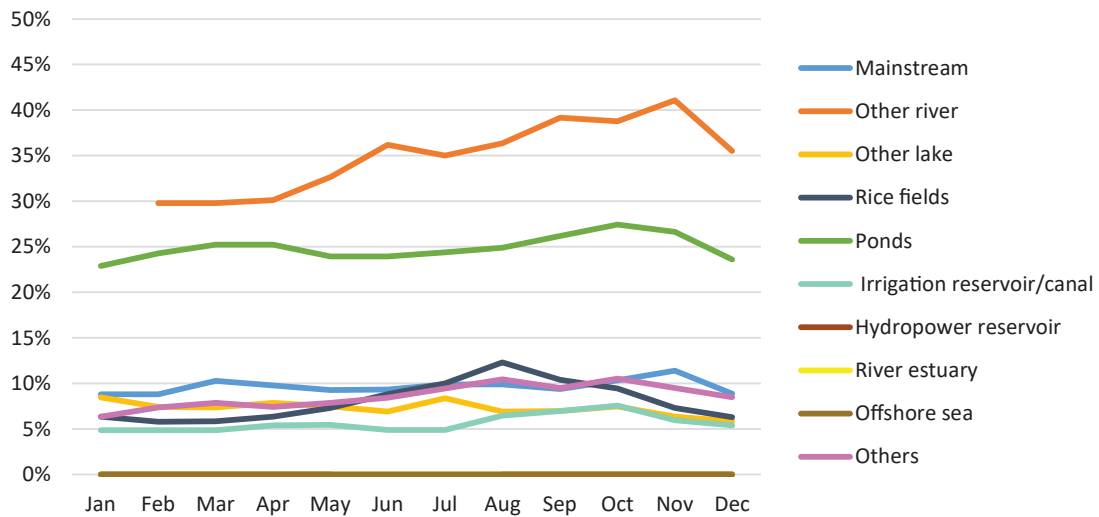
Figure 42. Fishing habitat in Thailand by month

In Viet Nam, other lakes/wetlands was the main habitat from January to July, and rice fields were the most common habitat from May to December. Other rivers and the Mekong mainstream, and ponds were mainly fished from February to April.
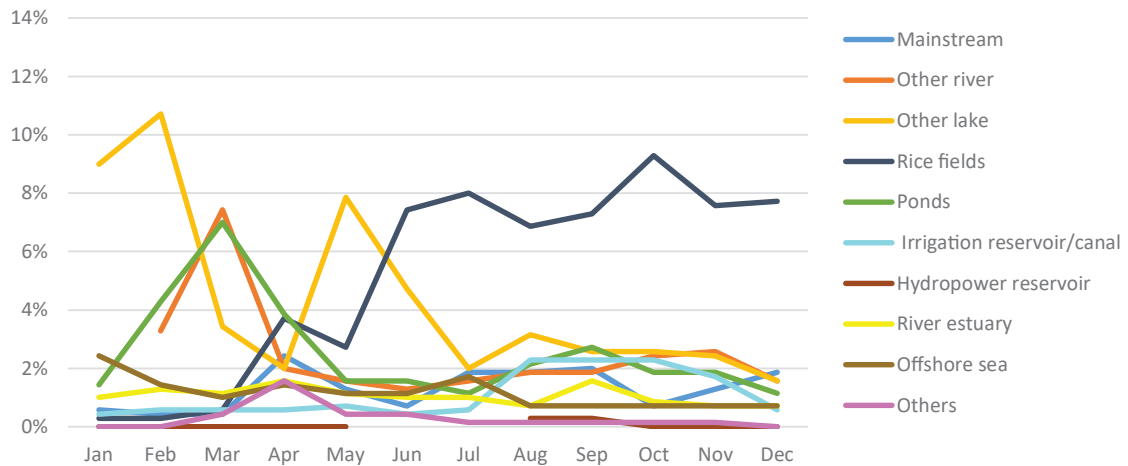
Figure 43. Fishing habitat by month in Viet Nam

In overall, the data reflected the complexity of fishing in the sample areas. It can be observed that other rivers/streams were a common fishing habitat in the region except for in Viet Nam, where rice fields were the more common habitat.

Figure 44 presents the percentage of households that sold, bought and consumed fish and frequency, as well as the sources of fish for consumption. About 42% of HHs had never sold fish in the last 12 months, and most of them were Vietnamese: only about 5% of HHs sold fish more than 3 times per week; 3% sold fish 2 to 3 times per week; and 4% sold fish 2–3 times per month. Fifty-one percent of HHs consumed fish more than 3 times per week; 70% bought fish for consumption; and only 1% ate fish from their own catch (Figure 45).

Figure 44. Percentage of HHs that sold, bought and consumed fish and frequency
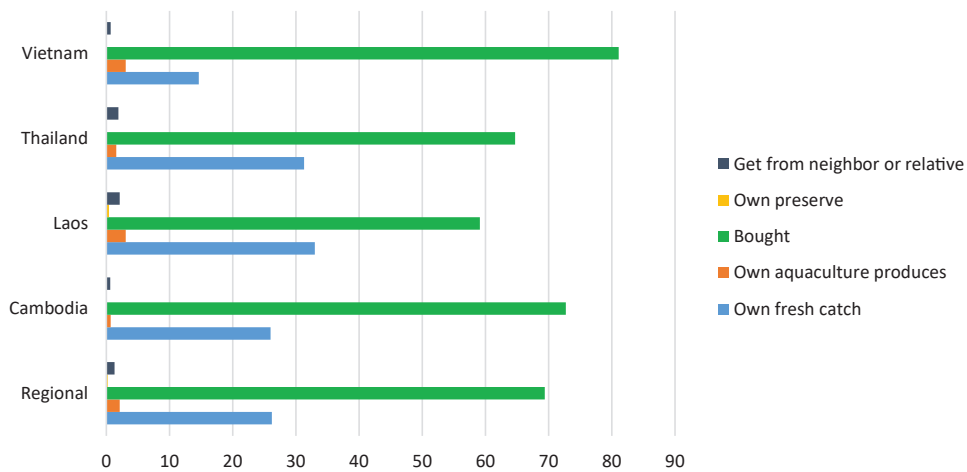
Figure 45. Sources of fish for consumption

During the latest meal, HHs consumed an average of 0.2 kg of fish per person; the amount differs little among the four countries (Figure 46).
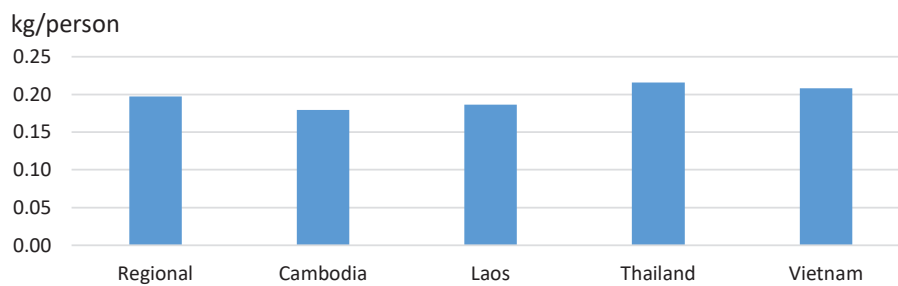
Figure 46. The average amount of fish per person that HHs ate during the latest meal that includes fish

4.6.3 Collecting other aquatic animals and plants

This section presents data on the collection of OAAs/Ps in different habitats over the year. In Cambodia, rice fields and rice ponds were the most important sources of OAAs/Ps. Collection in these kinds of habitats mostly occurred from June to December. Tonle Sap Lake and irrigation reservoirs/canals were also common habitats from June to October, while collection in other rivers and other lakes occurred from January to March (Figure 47).
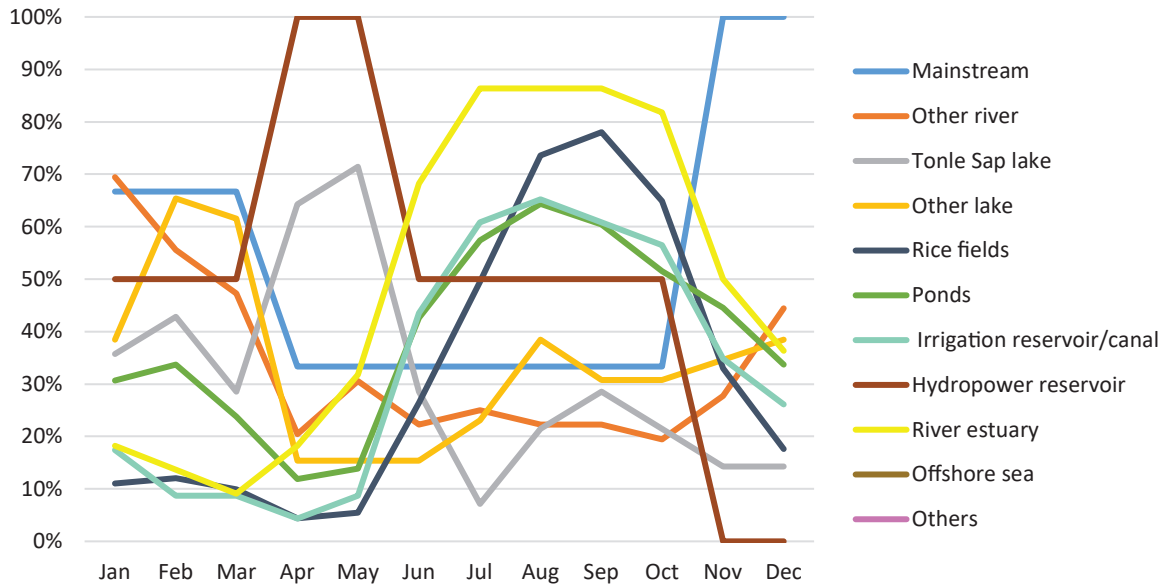
Figure 47. Collecting AAO/Ps in Cambodia (% of HHs)

In Lao PDR, rice fields and other rivers were the main habitats for collecting AAO/Ps. Collection in rice fields reached its peak in June and September, while in ponds it remained almost constant level all year round (Figure 48).
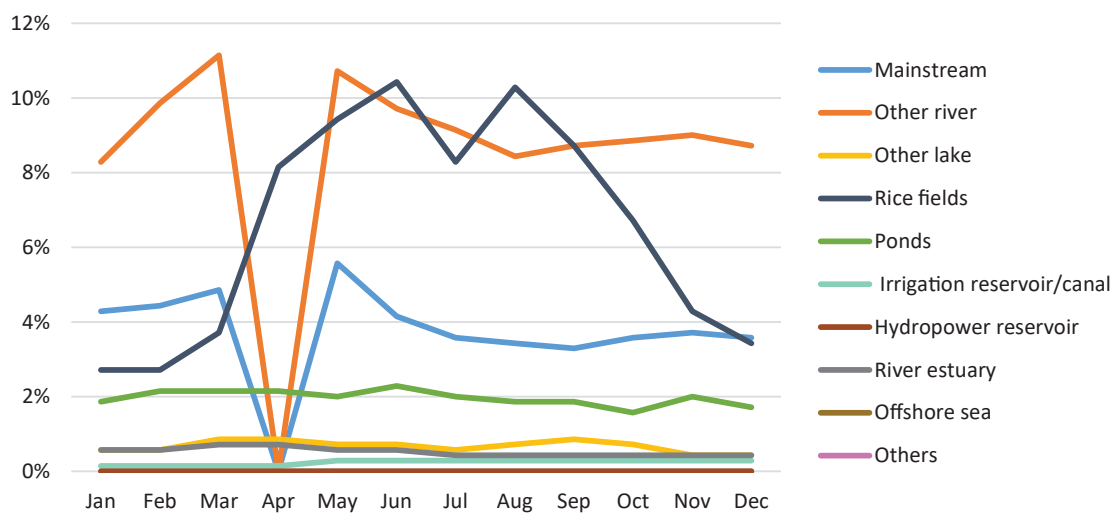
Figure 48. Collecting AAO/Ps in Lao PDR (% of HHs)

In Thailand, rice fields were also the most important collecting habitat, which peaked from May to December. Ponds and other river were the second most important habitats, whose collection took place at almost unchanged levels all the year round (Figure 49).
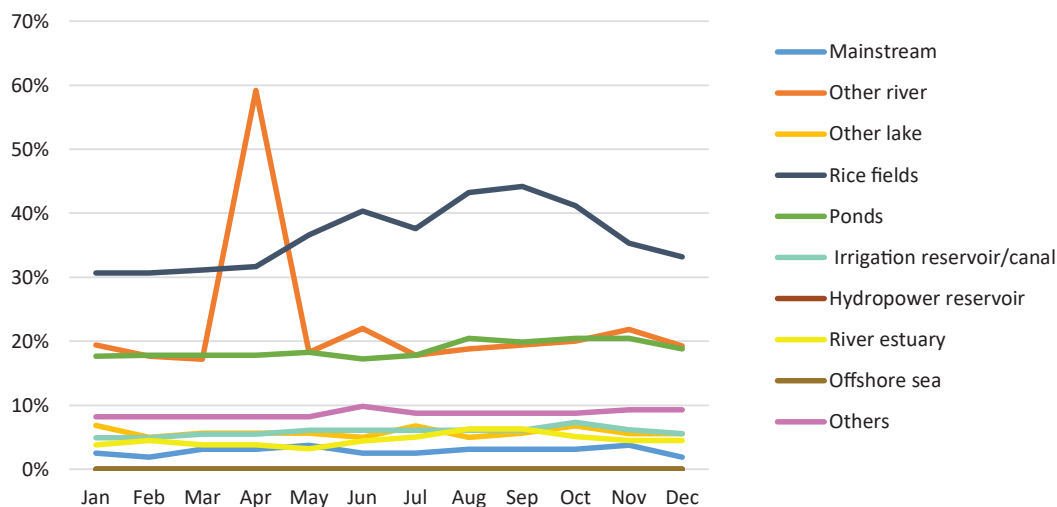
Figure 49. Collecting AAO/Ps in Thailand (% of HHs)

In contrast, in Viet Nam, rice fields and other lakes, wetlands, and swamps were the main habitats for collecting AAO/Ps, where collection was stable all year round. Other rivers were also a common habitat from March to May (Figure 50).
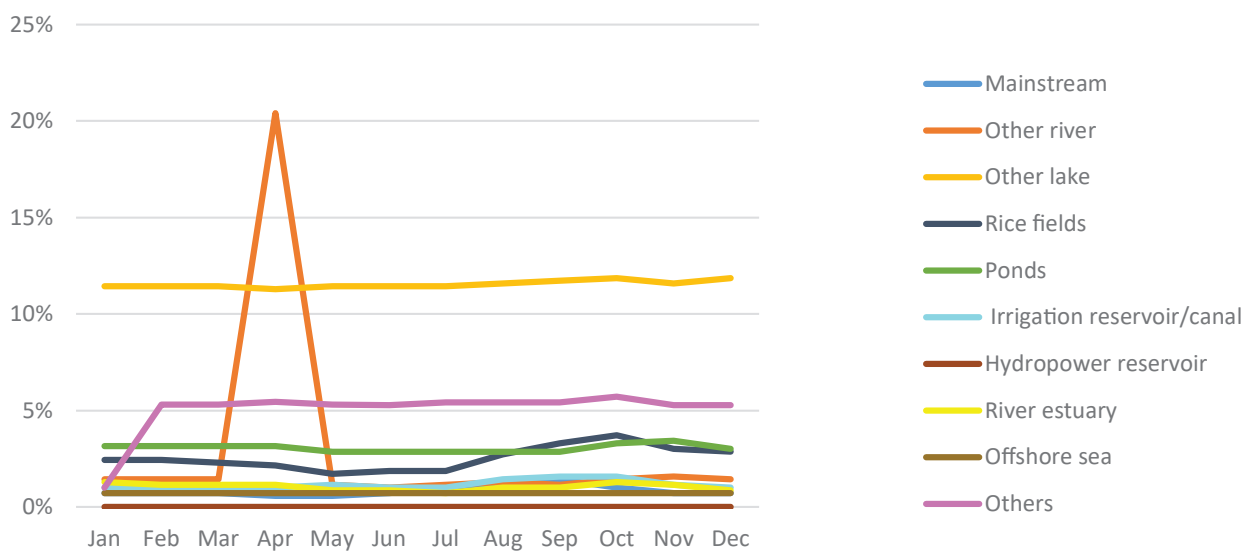
Figure 50. Collecting AAO/Ps in Viet Nam (% of HHs)

Figure 51 shows that about 36% of the total selected HHs were engaged in collecting OAAs/Ps in the last 12 months.

Most HHs never sold OAAs/Ps (48%); only 2% of HHs sold OAAs/Ps more than 3 times a week; and 1% of HHs sold OAAs/Ps 2–3 times a week. Hence, the selling OAAs/Ps was not the main income in the survey areas. In addition, 28% of HHs bought OAAs/Ps 2–3 times per week (Figure 52).

A. Selling OAA/Ps

B. Buying OAA/Ps
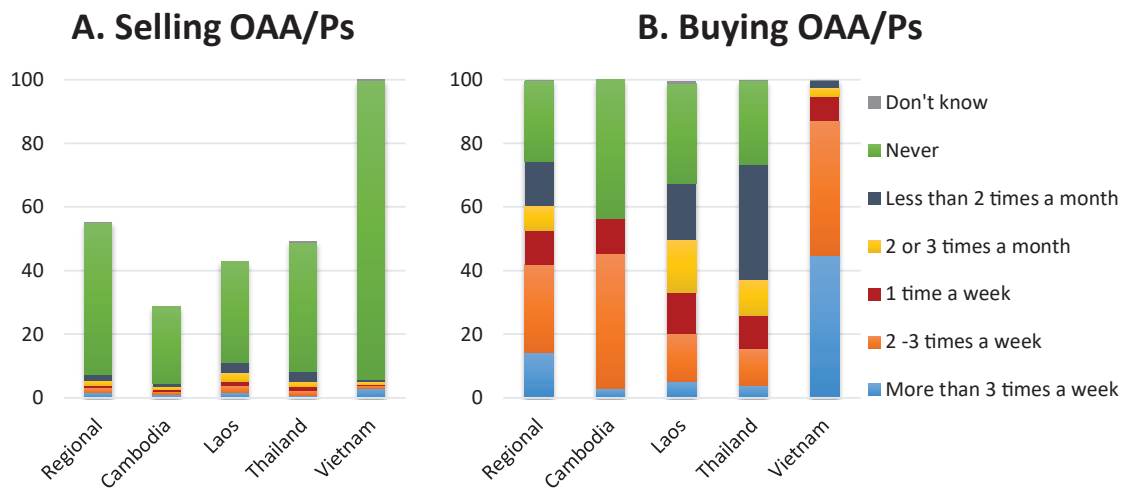
Figure 51. Selling (A) and buying (B) OAAs/Ps (%)
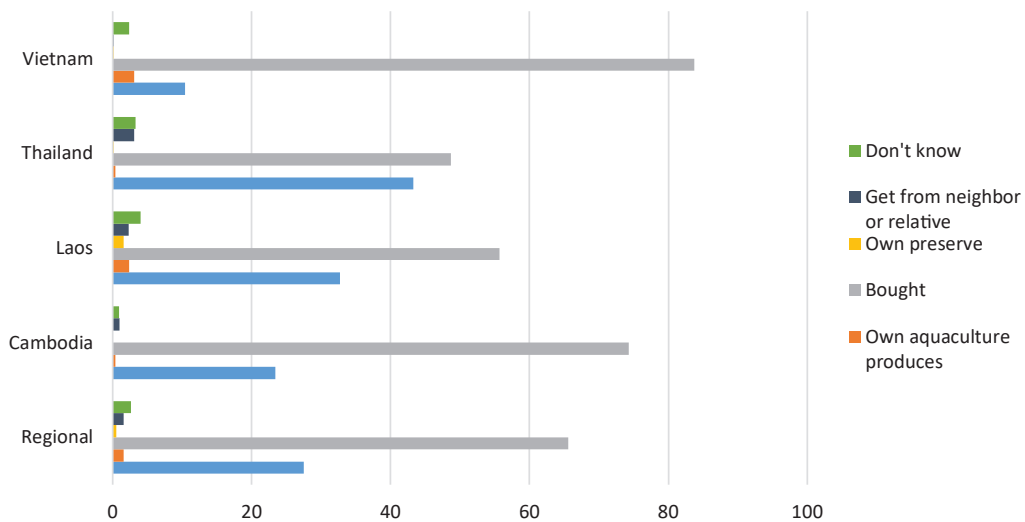
Figure 52. Sources of OAAs/Ps

The percentage of HHs with non-aquatic sources of income increased slightly from 2011 to 2018 at the regional level. Viet Nam had the largest increase (10%), from 90% to 100%, while Lao PDR had the smallest increase, at around 3%. In contrast, in Cambodia and Thailand, there was a decrease trend in income from non-aquatic sources (Figure 53).
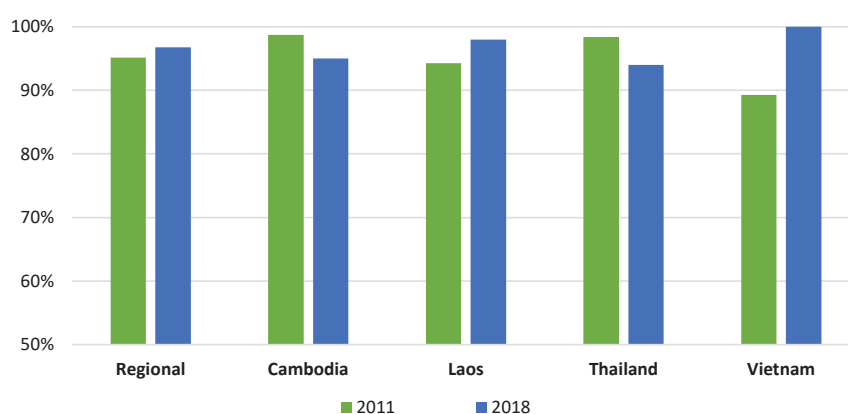
Figure 53. Percentage of HHs with non-aquatic sources of income

4.7 Climate change-related social vulnerability

4.7.1 Flooding damage and coping strategies

Around 43% of HHs experienced flooding in the last three years. In the last 12 months, 29% of selected HHs experienced flooding and most were Vietnamese. The percentage of HHs damaged by flooding in the last three years and 12 months was 26% and 20%, respectively. The percentages of cultivated land area and riverbanks, island gardens and fields damaged by flood were 62% and 63%, respectively. The mean value of rice lost was $417 in Cambodia, $592 in Lao PDR, $995 in Thailand, and $370 in Viet Nam. The mean value of losses of riverbanks, island gardens and fields was $639 in Cambodia, $226 in Lao PDR, $390 in Thailand, and $669 in Viet Nam (Table 20).

Table 20. Table 20. Losses and damages from flooding

No.	Indicators	Unit	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
1	Percentage of HHs experienced in the last 3 years	%	43.3	44.7	34.3	51.6	42.4
2	Percentage of HHs damaged in the last 3 years	%	25.9	24.7	27.7	39.9	11.1
3	Percentage of HHs experienced in the last 12 months	%	28.5	16.6	26.7	30.3	40.6
4	Percentage of HHs damaged in the last 12 months	%	19.3	14.9	26.0	27.0	9.1
5	Number of days lost	days	38	28	29	50	47
6	HHs have damaged paddy fields	%	15.8	12.4	21.9	23.6	5.4
7	HHs have damaged riverbanks and island garden cultivation	%	2.5	1.3	2.6	1.3	4.7

8	Percentage of total area of cultivated land damaged	%	61.6	59.7	62.5	66.6	40.1
9	Percentage of total area of riverbanks, island gardens and fields cultivation	%	63.0	58.7	68.6	77.2	57.2
10	Percentage of usual production from paddy	%	60.3	54.3	62.1	66.5	40.1
11	Percentage of riverbanks, island gardens and fields cultivation production	%	69	68	67	82	66
12	Average value of rice loss	US$	593.9	417.0	587.8	999.5	371.5
13	Average value of riverbanks or island gardens and fields loss	US$	481.4	639.0	223.6	392.1	670.8
14	Average value of aquaculture	US$	327.4	0.0	803.6	506.0	0.0
15	Values of property	US$	832.0	577.3	1679.9	884.8	185.9

In the 2018 survey, sample HHs often received assistance from the government (6.5%) to cope with flooding; Thai HHs relied more on government support (19%). Casual work and working outside the village were the second and the third most common coping measures, at around 4%. These jobs were mostly selected by Cambodians, of whom 7% of HHs chose to work outside the village and 8% took on casual work (Figure 54).
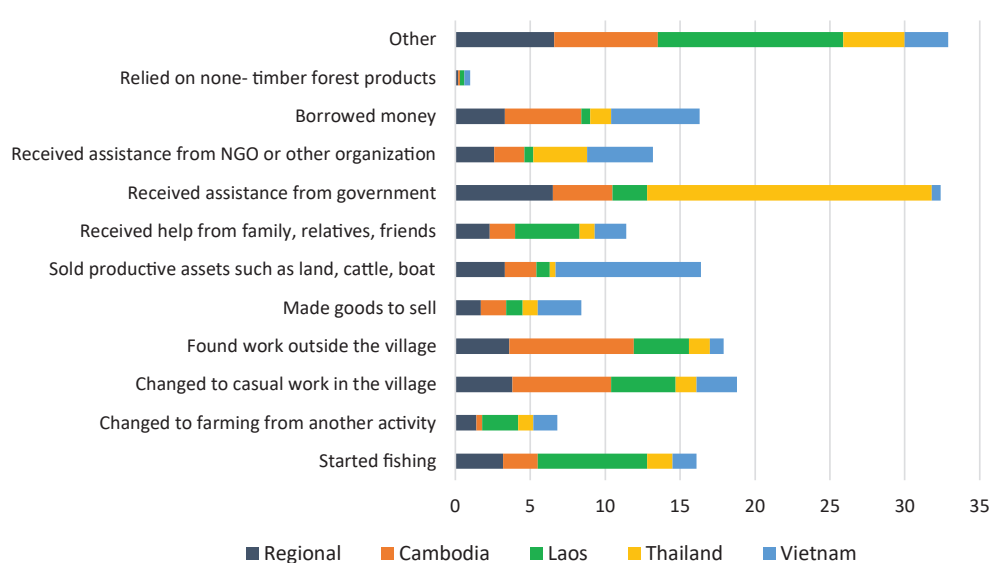
Figure 54. Coping strategies to flooding (%)

4.7.2 Drought damage and coping strategies

Table 21 presents the results of the 2018 survey on the experience of and damages caused by drought in the last three years and 12 months: 38.8% of HHs experienced drought in the last three years, and 25.2% experienced damages by drought; around 19% of HHs experienced drought; and 16% of HHs experienced damages by drought in the last 12 months. Thai and Cambodian HHs experienced drought more frequently than Laotians and Vietnamese HHs. Moreover, about 53% of the total cultivated land was damaged due to drought in the region. The percentage of total area of riverbanks, island gardens and fields damaged by drought was 34.1%; the largest percentage was in Thailand (100%).

Table 21. Losses and damages from drought

No.	Indicators	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
1	Percentage of HHs that experienced drought in the last 3 years	38.8	52.6	38.1	52.6	11.9
2	Percentage of HHs that experienced losses and damages in the last 3 years	25.2	34.1	25	34.7	7
3	Percentage of HHs that experienced losses and damages in the last 12 months	19.0	27	19.9	22.7	6.3
4	Percentage of HHs that experienced losses and damages in last 12 months	15.8	26	16.6	18.1	2.4
5	HHs experienced damages to paddy fields	14.6	25.9	14.7	16.3	1.4
6	HHs that experienced damages to riverbanks, island gardens and fields	0.5	0	1.3	0.3	0.4
8	Percentage of total area of cropland damaged	40.9	69.1	47.4	44.7	2.5
9	Percentage of total area of riverbanks, island gardens and fields damaged	34.1	0	35.6	100	0.8

The survey results indicate that assistance received from the government was the main coping strategy (5.2%), followed by working outside the village (4%), and shifting from farming to other activities (3%). More than other countries, the most common coping strategy for Cambodians finding work outside the village (11%), while receiving government assistance was more in Thailand than in other countries (13%) (Figure 55).
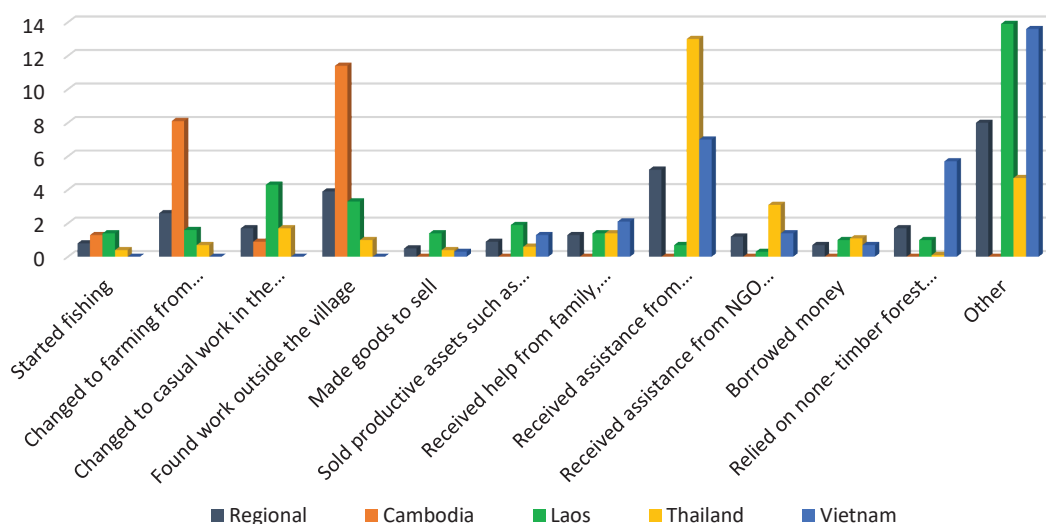
Figure 55. Strategies to cope with drought (% of HHs)

4.7.3 Saline intrusion and coping strategies

Saline intrusion mostly affects Vietnamese people due to specific topographical characteristics. Around 8.5% of HHs experienced saline intrusion; the affected area of cropland and the area of aquaculture production were 779.3 m2 and 184.3 m2, respectively. The average value of agricultural losses and aquacultural losses by saline intrusion were $98.59 and $50.87, respectively (Table 22).

Table 22. Impacts of saline intrusion

	Unit	Viet Nam
Percentage of HHs affected by salinity	%	8.5
Area of agricultural land affected	m2	779.3
Value of agricultural losses by salinity intrusion	US$	98.59
Area of aquaculture affected by salinity	m2	184.3
Value of aquaculture production losses	US$	50.87

4.8 Early warning and disaster preparedness

Figure 56 indicates the reliability of the flood warning systems in the sample areas. In general, local knowledge was considered the most reliable source with 52% for HHs, followed by radio in the village, at 52%. TV was the most reliable information source in Thailand with 73% of HHs, and Lao PDR, at 49% of HHs (Figure 56).
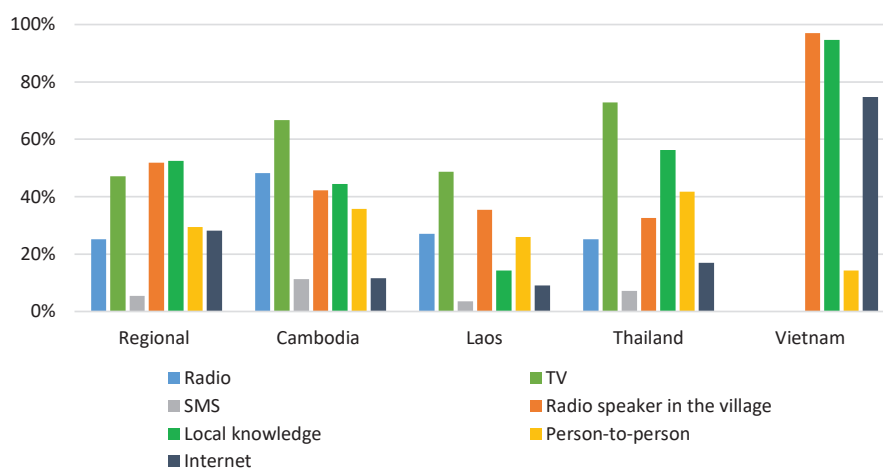
Figure 56. Flood warning information sources and their reliability

To cope with flood and drought, local populations adopted a wide range of measures (multiple response). Storage of food and drink was the most important measure (29% of HH), followed by improved transportation and communications (22%): Vietnamese HHs had the highest percentage (50.5%). Only 15% of the HHs adopted shelter and sanitation as their prevention measure (Table 23).

Table 23. Measures to prevent impacts from floods and drought (%)

Measures	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Shelter and sanitation	15	33.0	0	11.3	0.3
Storage of food and drink	29	30	0	32.7	25.0
Improved transportation and communications	22	0	0	16.0	50.4
Support from outside	19	0.1	0	52.3	3.7
Other	13	1.7	0	23.3	0
Do nothing	24	18.4	0	28.6	0
Do not know	8	16.3	0	3.1	3.6

4.9   Gender issues

Gender is an important aspect of vulnerability. Traditional gender roles are in force in many areas of the LMB corridor, and women and men do not have the same opportunities for employment and pay. A female-headed HH is vulnerable legally, socially, and economically, since it is typically also a single-parent HH. The survey found that 18.7% of the HHs were headed by females. Lao PDR and Viet Nam had the lowest rate of female heads of HHs, at 12.8 and 12.9, respectively, while Thailand had the highest rate, with 27.2%.

Lao PDR had the highest percentage of females participating in labour force, at 72.2%, followed by Viet Nam, at 59.3%. While Cambodia had the lowest rate, at 35.5%. Cambodia also had the lowest proportion of the female population that has completed primary education, at 18.3%, while Viet Nam had the highest rate, at 52.9%. The completion rate of upper secondary education of Cambodian HHs was very low (4.4%) compared to Thai HHs (51.9%) (Table 24).

Table 24. Female indicators (%)

Indicators	Regional (%)	Cambodia (%)	Lao PDR (%)	Thailand (%)	Viet Nam (5)
Heads of HHs	18.7	21.7	12.8	27.2	12.9
Labour force participation rates for 15+	56.5	35.5	72.2	59	59.3
Primary education completion rate	33.7	18.3	22.2	41.5	52.9
Upper secondary education completion rate	23.9	4.4	39.7	51.9	9.5
Education attainment of the population aged 25 and over	8.2	29	0.9	1.1	1.8
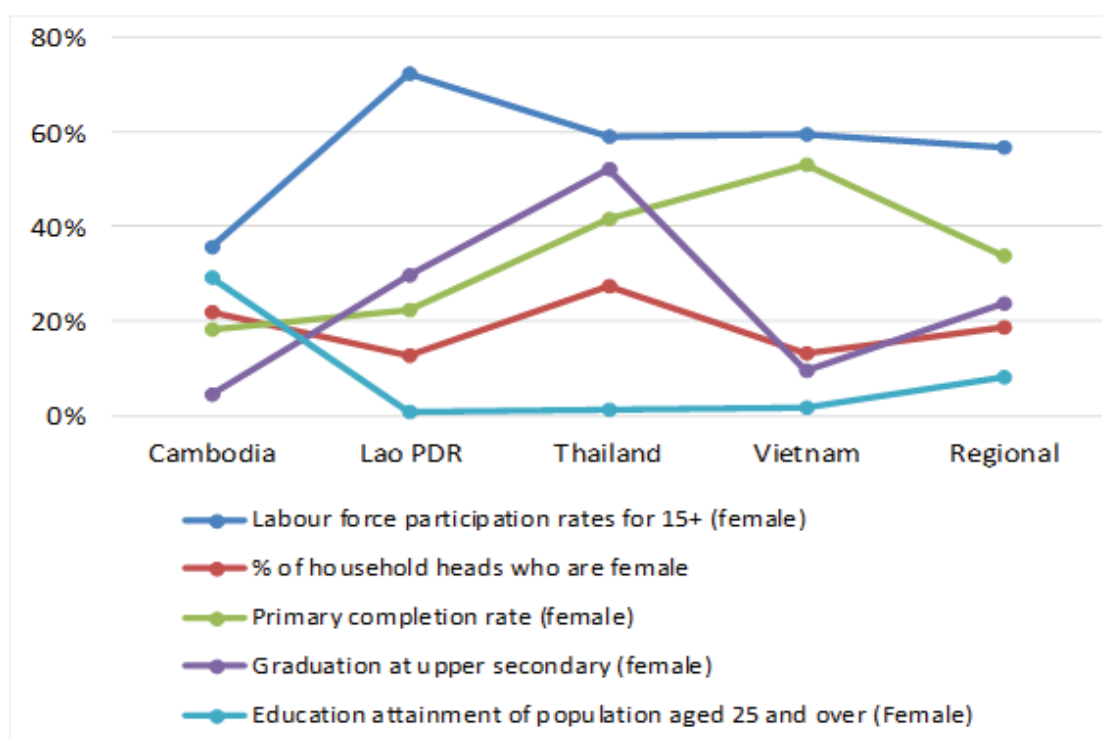
Figure 57. Gender-related features of HHs

▰▰▰ QUALITATIVE SURVEY RESULTS

5.1 Name, location and characteristics of the villages in the study

For the qualitative survey in 2018, 20 villages were selected in the four countries, whose names and locations are presented in Table 25.

Table 25. Names, location, topography, and characteristics of sample villages

Country	Village	Province	Topography	Characteristics
Cambodia	Hang Khou Ban	Stung Treng	Plateau and mountainous area	
	Anlong Preah Kou	Kratie	Plains	
	Kser	Kampong cham	Plains	
	Tuol Chey	Prey Veng	Plains	
	Daeum Kor	Takeo	Plains	
Lao PDR	Pakngum	Xaignabuly	Hillside	Crop farming is main occupation of the local people.
	Thapathum	Savannakhet		
	Xiengmaen	Luang Prabang		Villages located in rural areas in hillside
	Hongkhagnom	Champasak		
	Pakouay	Champasak		Mekong River crosses the village, which becomes a potential factor to support village development in terms of agricultural production, fishery, boat services, and tourism.
Thailand	Ban Huai Thian	Loei	Floodplains, plateaus	
	Ban suan Dok	Chiang rai	Riverbank, plains	
	Ban na nong bok	Nakhon Phanom	Plateaus, plains	
	Ban Suwan Wari	Ubon Ratchathani	Riverbank	
	Ban Yang Ngoi	Nakhon phanom	Floodplains, riverbank	
Viet Nam	Binh Trung	An Giang	Floodplains	All five villages are typical locations of rural areas in floodplains or plains.
	Ap 2	Tien Giang	Floodplains	
	Tan Loi	An Giang	Floodplains	Crop farming is the main occupation of all of these villages.
	Giong Giua	Tra Vinh	Plains	
	Ngai Quoi	Tra Vinh	Plains	The average area of each HH is about 0.68 ha; the value deviated from 0.33 ha to 1 ha per HH.

5.2 Main events that occurred in the last five years

Based on the qualitative study, many different types of events occurred in the last five years that had impacts on local communities in the four countries. In general, some of the important events were climate events such as flood and drought, the decrease of fish resources, crop and livestock diseases, and major events derived from natural and human causes, which all had both positive and negative effects on HH livelihoods. The coping strategies were short-term and mostly dependent on government support.

Cambodia

Electricity use: Before 2014, the village does not have electricity for consumption. The life condition of the village's population is under normal well-being scale because electricity is important for their life. From 2014 until present the village has electricity for usage, so the population feel happy due to having sufficient electricity for consumption. Electricity also helps improve villagers' livelihood. From 2015, the price of electricity has been high and electricity has been cut many times a day, which has made the villagers unhappy. If the price of electricity were lower and the power of electricity supply had been stable enough, village livelihood could have better improved. These changes are due to the fact that electricity is very important, for example, for consumption, for lighting homes. Currently, in the survey areas in Cambodia, there is almost a 100% coverage of home lighting. However, until only a few years ago, most Cambodians living in rural areas lacked access to electricity. The villagers were not satisfied with this situation, so they requested the commune authority to connect electricity for the villages, who reported to Electricite du Cambodge, who then connected the village to the electricity grid.

Toilet construction (support by the Provincial Rural Development authority): Before 2013, there was not much improvement in the number of toilets, which negatively affected the environment and sanitation; the well-being of population was below average but in 2014 some villagers constructed the toilet by themselves, so the sanitation has improved resulting in better feeling of the population. In February 2015, the Provincial Rural Development (PRD) authority began to support toilet construction for villages. First, PRD provided toilets to the poor HH and subsidized some labour in construction. This development made the villagers happier as result of the improved environment, better sanitation, and improved health of villagers. From 2016 to 2018, the Provincial Rural Development continued their support. Although the support did not reach all HHs, more toilets were available in this village resulting in the highest level of happiness and well-being in this village. Changes related to this issue is that hydropower dam releasing water has affected to the villager assets. Toilets have been destroyed by water released from hydropower dams.

Road Construction: In April 2013 and March 2014, two different events occurred related to road construction. The livelihood of the village's population improved due to better road conditions and less expenditures on transportation. Communities have a good road to travel, more middlemen came to buy agriculture products, so road construction is considered very important to their livelihoods. From 2015 to 2017, the road was partially broken, so the villagers find it difficult to travel and it created obstacles in getting agriculture products to transport to markets. Middlemen did not come to buy agricultural products due to the bad roads. Villagers became relatively hopeless because of this problem. At the end of 2018, the road was reconstructed and some roads in the villages are paved with concrete, the villagers in turn feel happy and their well-being improved. The villagers requested the authorities to construct a new road because the old one was destroyed by flood, and during the construction, travel was difficult.

Class room construction: From 2013 to 2015, in the village, there was one primary school with the old building that the student can study in but it was not comfortable. The students felt unsafe and worried every day due to the decay building. Their parents had concerns about children safety because the school was getting too old. In 2016, the Korean NGO DAI LAA supported a new school building for the primary school. Students are no longer worried about the school collapsing, which

was considered a motivating factor for students to work harder.

Coping strategies by the community – requesting for government support: The villagers had meetings and made a decision to request to the authority and EDC for electricity connection, then the authority forwarded this request to the government. The government responded and provided electricity connection. Government also supported road reconstruction and villagers contributed labour. Moreover, during flooding, the community had support from NGOs and other organizations to regain what was lost due to flooding. Community had the new school building under support from Korean fund (Dai Laor Organization).

Lao PDR

Within the last five years, the sample villages faced with different events that impacted on people's lives and livelihoods, for example:

In Pakngum village there was a decrease in the price of agricultural products. This is considered a man-made event. This impact was a strong negative event leading to loss of income for many HHs and the decrease of plantation areas. To cope with this event, local people decided to switch to grow more rice and change to livestock farming. The village also face with decreasing number of fish due to the use of electric device for catching fish. This event causes the reduction of fish abundance and loss of income for many HHs, thus reduce food security. Solution for this problem is prohibiting any electric devices for catching fish.

In Xiengmaen village, the Mekong Rriverbank collapsed due to human activities. The abnormal level of the Mekong River, an increase in navigation, and sand and gravel mining were considered the main causes of this event. The event had a negative impact, leading to the reduction of production areas and HH income. A coping strategy was proposed to the local government. The decrease in fish resources was also a problem for the people of Xiengmaen Village.

In Thapathum village there was a major flood caused by an increase in heavy rain. The event lead to increase fish source while causing crop and rice loss, income reduction and impact on transportation. The coping strategy for this event was short term with local Government and agencies providing support by offering land tax exemption or donating some food and drink to local people.

In Hongkhagnom village, local people faced with malaria disease outbreak due to increased monsoon rainfall. This made a strong negative impact on the village which impacted human health, thus deceased income of many HHs.

In Pakouay, there was a drought due to extreme hot weather that had a strong negative impact leading to crop and livestock deaths and disease outbreaks in livestock. The coping strategies were short term by local government support and changing to other jobs. More details on main events, impacts, causes and coping strategies can be found in Annexe 1.1

Thailand

There were 98 events in total: 67 events (68.4%) that had strong impacts on the well-being of villagers in five villages in Thailand; and 31 events (31.6%) that had weak impacts. Agricultural events were discussed more than other events, and 87.5 of these events had a strong impact on well-being. Other important events that had a strong impact on the well-being included those directly connected to the Mekong River or other water resources (76.5%), public and private forms of support (81.8%), and weather-related events (63.6%).

Below are examples from each village that discusses in more detail which highlights the different events experience by the villages.

In Ban suan dok, there was an agricultural event caused by the economic situation in Thailand (defined as a man-made cause). This led to an increase in the price of agricultural products. This impact was a strong positive event leading to an increase in income for many HHs. This event did not require any coping strategies.

In Huai thian, there was also an agricultural event with a strong impact. Plant disease, which was caused by human activity, had a negative impact leading to a reduction in HH income. Because of this event the coping strategy selected was an agricultural change to planting a more disease tolerant rice variety. This is viewed as a long-term strategy to deal with the negative impact.

In Yang ngoi, there was flooding connected to the Mekong River caused by monsoon rainfall (defined as natural causes). It had a strong impact on the village which led to a reduction in income for many of the HHs. The coping strategy for this event was short term with local Government and agencies providing support.

In Ban na nong bok, the Government provide support to the village which led to an improvement in access to services for the HHs. This was a strong positive man-made impact on the village.

In Suwan wari, there was a monsoon storm that had a strong negative impact leading to a riverbank collapse. This naturally caused event led to a reduction in natural resources which had a negative impact on the HHs in the village. Details on main events, impacts, causes, and coping strategies can be found in Annexe 1.2.

Viet Nam

The construction of infrastructure (schools, clinic station, roads, bridges, etc.) in the five villages through government support in order to improve rural development has been an important event. The event had a positive effect on the local community by improving access to services. Other positive events include the increase in new jobs and job training, a good rice harvest, improved health care, and low prices of agriculture products, etc. The root causes of these changes were increased investment by farmers in their own resources, and greater application of scientific and new techniques and strong government support.

The sample villages also faced negative events; riverbank collapse was one of the most severe. The causes of this event are strong flows in wet season, lack of embankment, upstream development, and sand mining. Riverbank collapse leads to the reduction of aquatic resources, a decrease in HH income and a loss of assets. Adaptation strategies for this event includes obtaining support for basin cooperation and external support fund for riverbank prevention.

Low prices of agricultural products were due to lack of market knowledge and product chains in all sample villages. The event causes a reduction in HHs income and livelihood security. Common solutions for this event are raising awareness, obtaining state support for farmers to find markets, strengthening the links between farmers and enterprises, improving cultivation techniques and quality of products, and receiving training/education from outside the village.

Drought and water shortages due to climate change and the unstable discharge of the Mekong River have detrimentally impacted on HHs in Ngai Quoi and Binh Trung villages. These negative events impacted on agricultural production, reducing the income of many HHs. The coping strategies adopted by local communities were changing agricultural practices and water sluice construction. Details on the main events, impacts, causes, and coping strategies are provided in Annexe 1.3

5.3   Main occupations and the trends in the villages

The quantitative survey provided information on changes in occupation in the sample villages.

In Cambodian villages, the main occupation in the villages was farming (50%), followed with selling/trading and fishing (both 10.7%) as shown in Table 26.

Table 26. Main occupations in Cambodian sample villages

Main occupation	No. of villages	Percentage (%)
Garden planting on the banks of tributaries	2	3.6
Farming	28	50.0
Animal feeding	4	7.1
Fishing	6	10.7
Housewife	1	1.8
Selling/trading	6	10.7
Sub-district authority	1	1.8
Team leader	1	1.8
Village chief	4	7.1
Village elder	1	1.8
Village member	2	3.6
Overall total	56	100

In Lao PDR, the discussion focused on changes in the importance of fisheries, irrigation, navigation, and sedimentation. Figure 3 shows the importance of fisheries between 2013 and 2018. Fisheries gradually become less important to local communities in the five villages. In Pakouay, fisheries were still important but experienced a slight decrease in importance in 2018. Figure 59 provides the trends in the importance of navigation. In Pakngum and Pakouay, navigation was still important and showed stable trend, while in other villages, it was less important. There is a significant decrease in the importance of sedimentation to Xiengmaen, while in Pakngum, sedimentation was still an important occupation. In Pakouay, the importance of sedimentation increased from much less important in 2013–2015, to important in 2017.
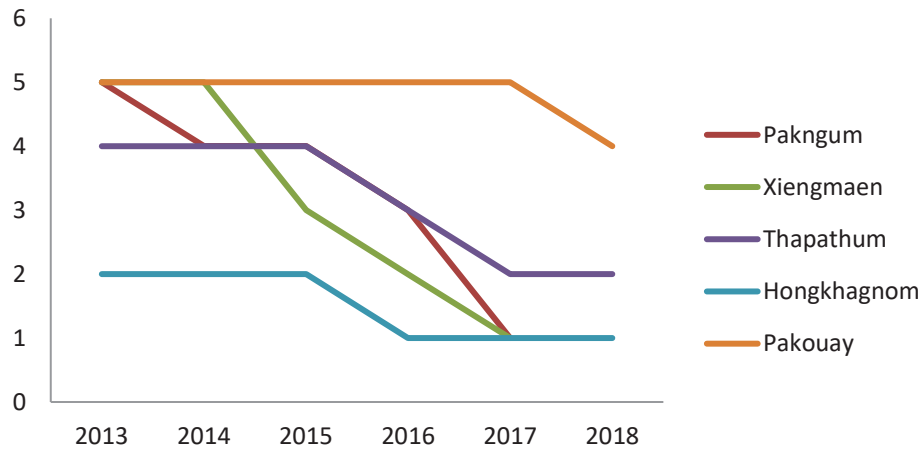
Figure 58. Trends in fisheries in Lao PDR, 2013–2018
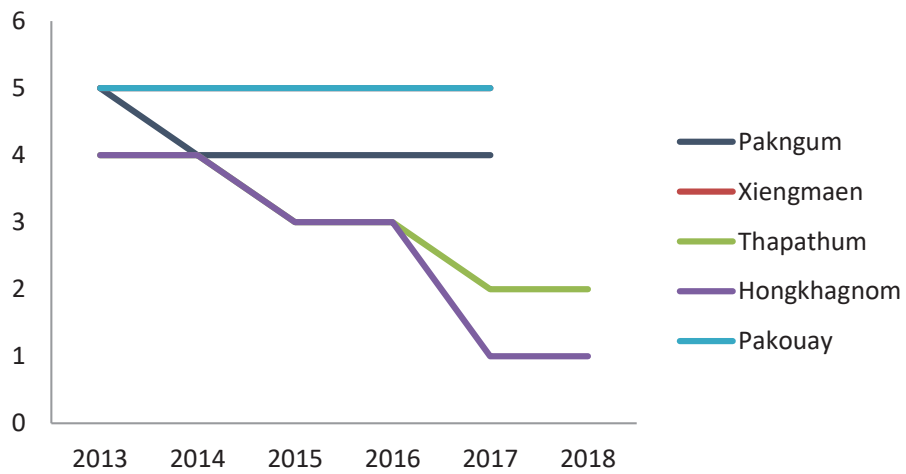
Figure 59. Trends in navigation in Lao PDR, 2013–2018
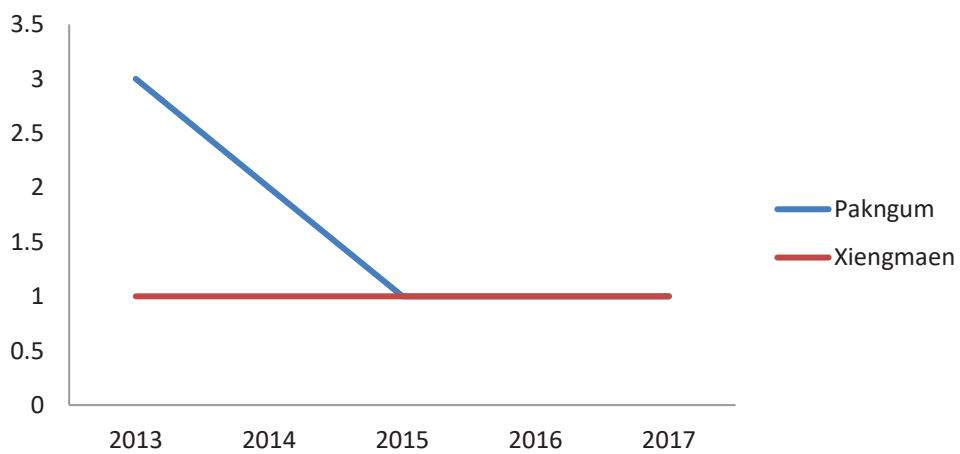
Figure 60. Trends in irrigation in Lao PDR, 2013–2018
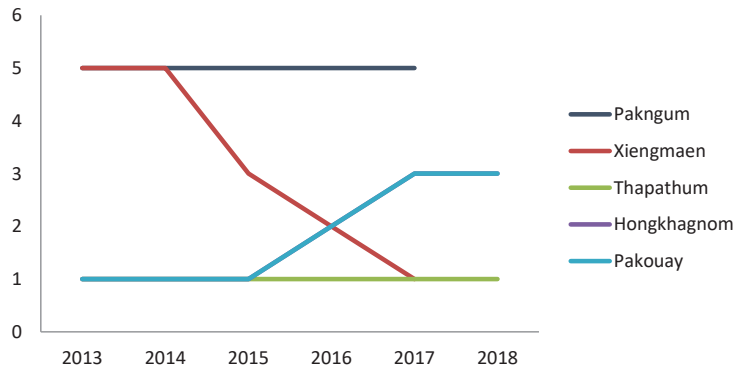
Figure 61. Trends in sedimentation in Lao PDR, 2013–2018

In Thailand, the survey focused on changes in the importance of fisheries, irrigation and navigation to the communities. Figure 62 shows the importance of fisheries between 2014 and 2018; Yang ngoi is the village where fishing was consistently the most important. Over the last 12 months (2017–2018), the importance of fisheries decreased over time In Suan dok, but suddenly become important for Na nong bok. Figure 63 shows trends in the importance of irrigation. In Huai thian, irrigation was consistently of low importance, and in Suwan wari, it showed increased in importance from 2016 to 2017. In the other three villages, irrigation was very important. A gradual decrease in the importance of navigation to Ban Suan dok is observed (Figure 64).
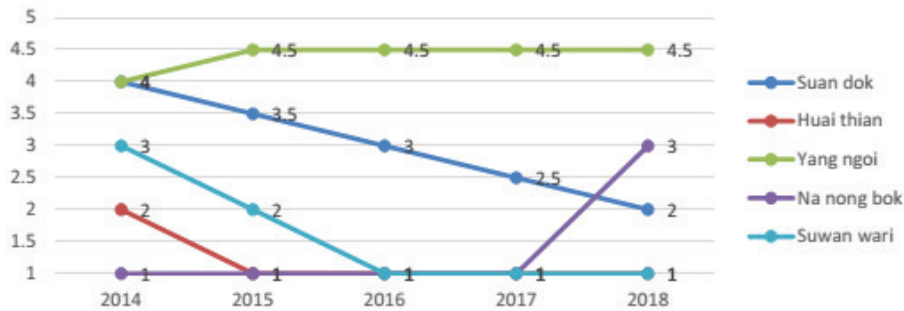
Figure 62. Trends in fisheries in Thailand, 2014– 2018
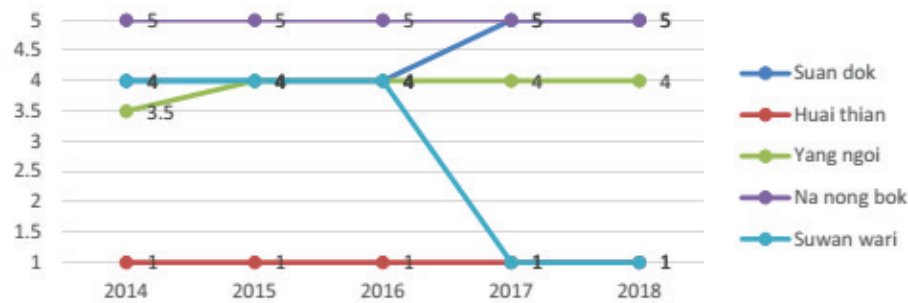
Figure 63. Trends in irrigation in Thailand, 2014–2018
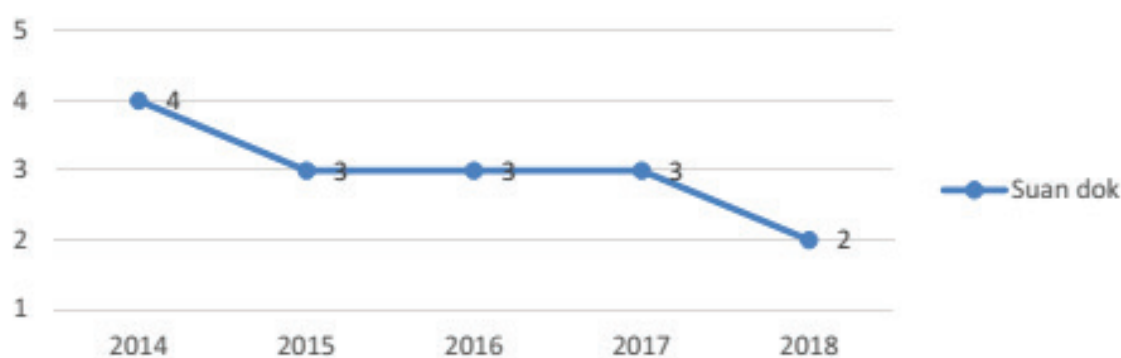
Figure 64. Trends in navigation in Thailand, 2014– 2018

In Viet Nam, the changes in main occupations found in the five sample villages are indicated in Table 27. Both Tan Loi and Binh Trung villages had one occupation being rice cultivation. The Ap 2 village also has only one occupation, fruit tree cultivation. Ngai Quoi had three occupations, included rice cultivation, livestock raising and dry cropping. Giong Giua village had four main occupations: aquaculture, rice cultivation, sugar cane cultivation, and cattle raising.

Table 27 points out the trends of the main occupations in the qualitative survey villages. Rice cultivation is main occupation in Tan Loi village, Ngai Quoi, and Binh Trung village. In these villages, it was stable in the last five years. These villages are in freshwater areas, although Binh Trung village is located at the beginning of saline water, so the water is still suitable for rice cultivation. Fruit tree cultivation in the Ap 2 village has also been stable during the last five years.

The trends of the main occupations changed significantly in Giong Giua village. The village has four main occupations: aquaculture, rice cultivation, sugarcane cultivation, and cattle raising. However, aquaculture has been quickly increasing in the rice and sugarcane areas, thus reducing the prevalence of these other occupations. Cattle raising is not a major occupation and is stable (Table 27).

Table 27. Main occupations in the sample qualitative villages

Year	Tan Loi-RC	Binh Trung-RC	Ap 2-FC	Giong Giua -AQ	Giong Giua -SC	Giong Giua -RC	Giong Giua -CR	Ngai Quoi -RC	Ngai Quoi -LI	Ngai Quoi -DC
2013	4	3.8	4	1	4	4.5	1	4.5	4.8	4
2014	5	3.8	4.5	2	3	4	1	4.5	5	4
2015	4	4	4.5	4	2	3	1	4	4.5	3.5
2016	4.5	4	4	3	2	2.5	1	4	4	3.5
2017	4.4	4.3	4	2	1	1.5	1.2	4	3.5	3.8
2018	4	4	4	5	0	1	1.5	4	3.5	3.5

Note: RC= rice cultivation; Li=livestock raising; DC=dry cropping; FC=fruit tree cultivation; AQ=aquaculture; SC=sugarcane cultivation; CR=cattle raising.

5.4　Trends in community well-being

To find the trends in well-being of the communities, people in the FGDs of each village were asked to explain their perception of well-being based on their overall view of life. They were also advised to consider the events that had occurred during the last ten years. For their easier recall, it was advised to compare their life in the one-year period. The scale ranges from a minimum of 0 to a maximum of 5. Some main trends in human well-being are summarized below.

For Cambodia, Figure 65 shows the trends of community well-being according to FGDs in five villages; the perception was that the well-being trends had a positive or negative impact during the last ten years. This resulted from several events that increased in level of severity or occurrence; e.g. electricity supply sharply increased due to the government's construction of hydropower plants in the country as well as other infrastructure construction (bridges, canals, dams and roads). Some participants raised the issues of health care and education facility of poor condition, low prices and a limited market for agricultural production after harvest, albeit this was not the common view across the board.
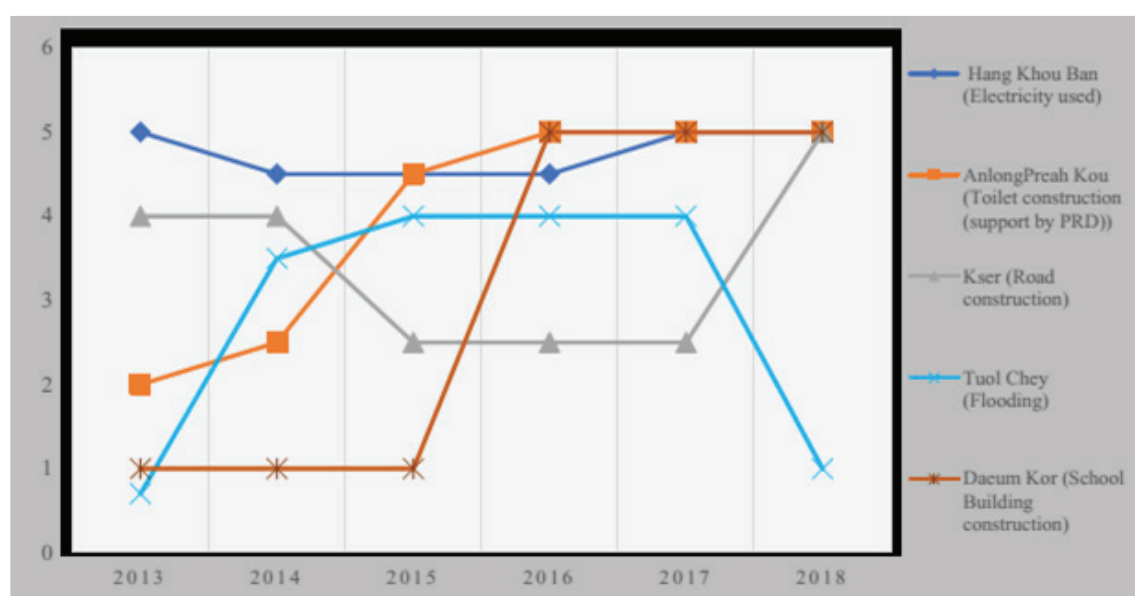
Figure 65. Score of well-being in the five villages in Cambodia, 2013–2018

For Lao PDR, there are several changes in well-being in recent years. From 2013 to 2018, there was an increasing trend in well-being level of the five sample villages. In Pakngum and Xiengmaen, improved well-being started in 2016, while in other villages, it started in 2015. It should be pointed out that Pakouay experienced a sudden decrease in its well-being in 2018 (Table 28).

Table 28.　Well-being score of five villages in Lao PDR, 2013–2018

	Pakngum	Xiengmaen	Thapathum	Hongkhagnom	Pakouay
2013	3	3	3	3	3
2014	3	3	3	3	3
2015	3	3	4	4	4
2016	4	4	4	4	4
2017	4	4	4	4	4
2018	N/A	N/A	4	4	2

For Thailand, Figure 66 shows the well-being of villages between 2014 and 2018. Na nong bok has had consistently a high score in well-being. In Huai thian and Suan dok, there was a small variation in the average well-being level. The other two villages showed the greatest variability. Yang ngoi had a notable decrease in well-being from 2017 to 2018, while Suwan wari had a decrease between 2014 and 2016, but increased in 2018, possible due to major flooding and drought in that year (Figure 66).
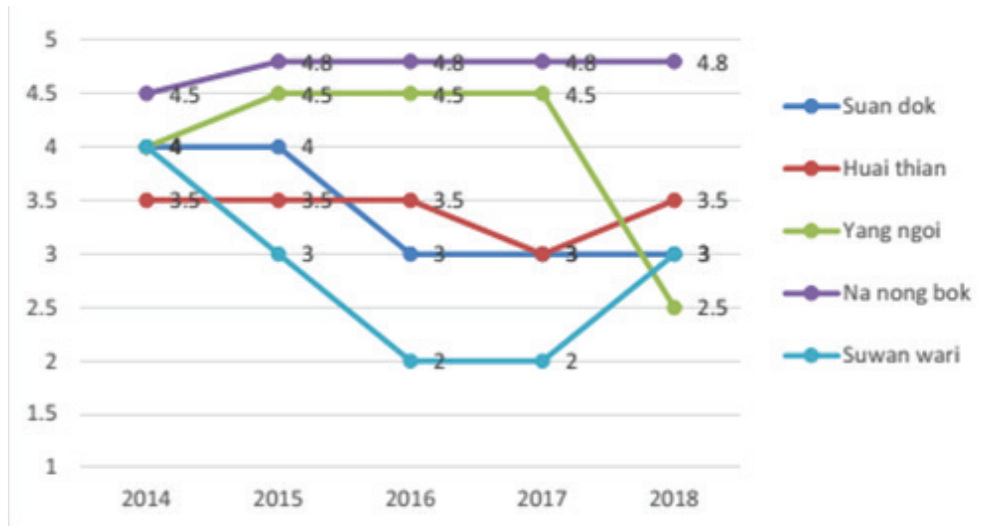
Figure 66. The well-being score of five villages in Thailand, 2014–2018

For Viet Nam, scores of well-being in the 5 sample qualitative villages are presented below. It appeared that in Binh Trung, Ap 2, and Tan Loi villages (freshwater area), well-being is stable and slightly increasing in the last five years. In these villages in Ngai Quoi and Giong Giua (saline water area), well-being slightly decreased in the last five years. These trends correspond to the changes in main occupations. There are fewer main occupations In the freshwater areas than in saline water areas. However, occupations were stable in the last five years, so that the well-being of these villages was stable and slightly increasing (Figure 67).
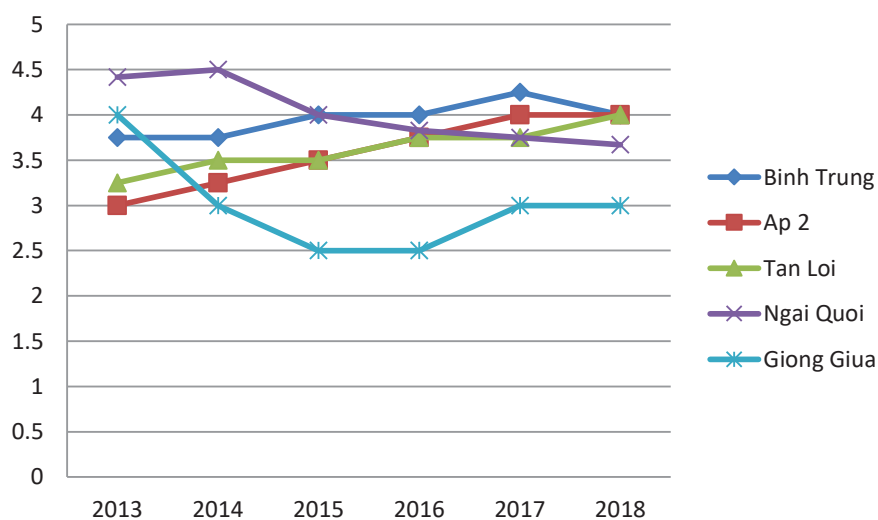
Figure 67. The well-being score in the five qualitative sample villages in Viet Nam, 2013–2018

■■ ■ CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The SIMVA 2018 survey has provided information on the status and trends of the social-economic conditions of the people in the Mekong River corridor and the trend in people dependence on water resources. This survey also provides data and information on social vulnerability (particularly food and livelihood vulnerability) linked to changes in water resources (agriculture, aquaculture, fish, OAAs/Ps), and HHs' resilience in coping with these changes. The relationship between socio-economic conditions and people's dependency on water resources determines their vulnerability to changes in the water resources. The survey as such provides information that can potentially be used for socio-economic impact assessments or monitoring for the MRC 2021–2025 cycle and longer-term basin development planning and monitoring. The long-term monitoring of SIMVA aims to: identify any significant changes in HHs' access to water resources; identify any significant changes in HH welfare and livelihoods;lLink these changes to their levels of vulnerabilities, in particular, livelihood vulnerability; and help identify measures to deal with potential social impacts of economic activities and projects in region.

The quantitative survey at the village and HH levels provided demographic information, vulnerability indicators, information about dependence on local resources, resilience indicators, climate change social indicators, and gender-specific indicators. Some main observations from the quantitative survey are as follows:

- Compared to the 2014 survey, crop farming is still the major livelihood in all study sites, reflecting that local livelihoods are vulnerable to changes in water resource and climate change impacts. However, trading (included services) has become the second most important. Migrating to work in other districts or provinces is very common for almost all sample villages.

- With regard to labour mobility, in the four countries people mostly travel to other fishing areas to fish.

- with regard to water supply resources, piped water and bottled water were the main water sources in the corridor, especially in Viet Nam and Thailand.

- Among the main climate shocks related to Mekong River system, flooding was the largest and the most impactful event in the Mekong corridor. Compared to the 2014 survey, losses and damages from main climate shocks, especially flooding has increased significantly in all areas.

- The consequences of climate extreme events varied among surveyed zones. While flooding impacted all countries, only Viet Nam suffered from saline intrusion.

- The most serious flooding was river overflow, and the main causes of flooding were from normal rains/monsoons and extended monsoons.

- The main causes of drought were extreme weather/climate change and an extended dry season.

- In term of adaptation, more than 80% of villages in Thailand and Viet Nam made efforts to prevent climate change, although in Lao PDR and Cambodia, this figure is less than half. There have been numerous measures to adapt to climate change, principally raising awareness (primarily in Viet Nam and Thailand), i.e. non-structural, but in some cases, there have been changes to crop patterns (in Lao PDR and Thailand) or building dykes (primarily in Cambodia), i.e. structural.

- The people living along Mekong River corridor are vulnerable to changes in water resources and climate events since their livelihoods in farming and fisheries strongly depend on water resources and weather conditions, and they have limited measures to cope with the impacts of these changes.

The analysis of qualitative survey revealed key changes in occupation and the well-being of local communities

- There were some improvements in local infrastructure, such as the construction of new road and bridges in Viet Nam.

- The main events causing negative impacts were riverbank collapse; low prices of agriculture products; disease outbreak; a decrease in fish resources; and climate events such as flooding, droughts, and water shortages (mostly in Viet Nam).

- Among the main climate shocks related to the Mekong River system, flooding was the largest and the most impactful event in the Mekong corridor. Compared to the 2014 survey, losses and damages from main climate shocks, especially flooding, increased significantly in all areas.

6.2 Recommendations

It is recommended that, the SIMVA survey continues to capture primary data of community dependency on the Mekong River water resources. Surveys should take place every four years to capture possible trends of vulnerability in the corridor. The main components of future SIMVA surveys, on social vulnerability (particularly food and livelihood vulnerability) linked to changes in water resources (agriculture, aquaculture, fish, OAAs/Ps) remain unchanged in order to allow for a comparison of further trends.

The data collection approach is important to ensure accurate data for a temporal overview of the situation on the Mekong mainstream. It is vital to train staff collecting data to ensure understanding of the required data and consistency.

Arranging and conducting interviews with HHs can be time-consuming. In some cases, the HHs did not agree to complete the survey. The number of replacement HHs should be increased, and when an original HH was not available, an alternative was selected to reduce the time burden for data collection.

Regarding the reliability of data, some questions were understood differently in different countries; as a result, some collected data were inconsistent. Thus, it was necessary to ensure that the questionnaires were clear and easy to understand.

When entering data, all the countries should develop codebooks and have the same coding in order to ensure that the aggregate data for the entire region is calculated and analysed accurately.

Regarding to data analysis, some answers were categorized as "Other" but were not specified. Therefore, further analysis of the data may elicit clarification on what the 'Other' category covers.

The coping strategies for negative events are limited, therefore, governments should take a more active role and develop more pro-active actions to deal with negative events. Some proposed strategies to mitigate the negative impacts are as follows:

- Implement Reducing Emissions from Deforestation and Forest Degradation (REDD+) and reduce the exploitation of natural resources, particularly in order to save forest and perennial plants to reduce emissions of carbon dioxide gas, which can reduce the impacts of climate changes.

- Develop incentives to reduce the unstable use of the natural resources, particularly in order to prevent overexploitation of river sand, and aquatic fauna and flora with electric shock.

- Change agricultural practices by changing varieties and crop calendar of agriculture production.

- Mobilize support for Basin cooperation, setting up an external support fund for riverbank preservation.

- Provide training/education to villages and promote alternative livelihood activities.

- Seek new markets, improve cultivation techniques, and improve the quality of products.

- Strengthen advocacy and mobilization control measures for cultivation technology to cope with climate change.

- Improve awareness of the people/state support available to farmers.

- Strengthen the links between farmers and enterprises, and markets.

- Strengthen the legal implementation of environmental protection, encourage people to use water in a more efficient manner, restrict drug use in plant protection, and support the use of biological medicinal products.

Additional issues to be explored for future surveys are as follows:

- Expand study areas and redistribute sampling sizes among the zones to better reflect the population sizes.

- Rename the zones to include country names for easy reference.

- Review the indicators to make them more suitable to emerging issues such as the use of Mekong water, migration, livelihood options, and health outcomes.

- Disseminate SIMVA data and make use of it for Prior Consultation processes, including for monitoring and socio-economic modelling.

■■■ GLOSSARY AND DEFINITIONS

Concept	Definition and meaning
Adaptation (in context of climate change)	Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (IPCC, 2001).
Aquaculture	Raising of fish, shrimp, and any other aquatic species.
Climate change	A statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer). Climate change may be due to natural internal processes or external forces, or to persistent anthropogenic changes in the composition of the atmosphere or land use (IPCC, 2001)
Climate change-related livelihood activities	Include farming, fishing, collection of OAAs and aquaculture.
Climate variability	Variations in the mean state and other statistics (such as standard deviations, the occurrence of extremes, etc.) of the climate on all temporal and spatial scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system (internal variability), or to variations in natural or anthropogenic external forces (external variability) (IPCC, 2001).
Coping strategy	Coping strategies refer to the specific efforts, both behavioural and psychological, that people employ to master, tolerate, reduce, or minimize stressful events. Two general coping strategies have been distinguished: problem-solving strategies, which are efforts to alleviate stressful circumstances, and emotion-focused coping strategies, which involve efforts to regulate the emotional consequences of stressful or potentially stressful events. In this context, problem-solving coping strategies are the most relevant; they can include agricultural strategies such as changing crops, obtaining cash such as by selling off assets, or change of residence.
Extreme weather events	Unusual weather events for the season with severe impacts
15 km corridor of LMB	A corridor or buffer zone drawn along the mainstream of the Lower Mekong River and the maximum extent of flooded areas. The corridor covers 15 km from either side of the mainstream and 15 km for buffer zones of wetland and flooded areas such as Songkram, Tonle Sap, and the Mekong Delta.
Fishing effort	Computed based on the average catch divided by average hours of fishing per day in the year.
HH head	According to the HH member interviewed, the head of the HH is commonly an adult – female or male – who is responsible for the HH.
Income from non-aquatic sources	This includes the sale of other crops, livestock, business (profit), full-time employment, irregular/seasonal employment, pensions, credit/loans, savings (in bank or not), remittances (money sent by HH members) and interest.
Livestock	This includes cattle, buffalos, pigs, goats, horses, donkeys, but not poultry.
Main occupation	What people spend most of their time doing, or what provides the most income.

Most important occupation	Many rural HHs in the LMB corridor are increasingly dependent on a combination of activities. Some or all members of some farming HHs in rural areas work part- or full-time in non-agricultural activities. The SIMVA questionnaire was designed to identify the first and second most important occupations. SIMVA has details on the most and second most important occupations in terms of sustaining the livelihood of a HH.
OAAs	These include frogs, tadpoles, crabs, snails, clams/shells, shrimps, eels, turtles, and others.
Primary domestic water resources	These are water resources used for drinking, bathing and washing.
Resilience	In the context of climate change, resilience has been defined as "The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization and the capacity to adapt to stress and change" (IPCC WG2, 2007, p. 880). Consumption, expenditure, and livelihood assets, with the assumption that HHs with (i) more consumption and spending; (ii) more food stored; (iii) more diverse livelihood assets and sources of income; and (iv) better health and more social capital, will be more resilient to change.
Riverbanks, island gardens and fields	These include gardens and fields on steep slope areas of the Mekong, which are sometimes flooded in the wet season, and the areas above these area, which have a less steep slope but is sometimes flooded from the river; and the same occurs for rivers and streams that flow into the Mekong and for islands in the river that are used for fields and gardens.
Sensitivity	Sensitivity is the extent to which people who depend on water resources might be affected by changes in LMB resources.
Shock	An event that occurs suddenly and unexpectedly and that has a strong impact. It can destroy assets directly in the case of floods, storms, etc. and can also force people to abandon their homes and dispose of assets such as land. Shocks that devastate the livelihoods of the poor are natural processes that destroy natural capital, e.g. floods that destroy agricultural lands (DFID, 1999).
Social groups	These include religious groups, women's unions, youth unions, as well as elderly groups, savings and credit groups, farmer groups, fisher groups, shared labour groups and veteran groups.
Trends	Trends are a key element in the vulnerability context, which can have a positive or negative effect on livelihoods. They involve changes that take place over a longer period than is the case with changes brought about by shocks or seasonality, e.g. population trends (increasing population pressure), resource trends, economic trends (DFID, 1999).
Vulnerability	Livelihood vulnerability is a balance between sensitivity and resilience of livelihood systems (Alwang et al., 2001). Highly vulnerable systems are characterized as low resilience and high sensitivity, while less vulnerable systems have low sensitivity and high resilience. Livelihood resilience allows a system to absorb and utilize (or even benefit from) change. In the context of climate change, vulnerability has been defined as "the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity" (IPCC WG2, 2007, p. 883).

| Water-related occupations | These include fishing, the collection of OAAs, aquaculture and farming. |
| Water-related resources | These include fish, OAAs, irrigated and riverbanks and island garden or field crops. |

Exchange rate applied (average estimated for 2020) USD1 = 4,000 Cambodia Riel (KHR) = 8,900 Laotian Kip (KIP) = 31 Thai Baht (THB) = 23,000 Vietnamese Dong (VND)

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Annexe 1: Main events in the last five years

Annexe 1.1

Table 1.1.1. Matrix of events, impacts, causes, and coping strategies in Pakngum Village, Hongsa District, Xaignabuly Province, Lao PDR

Events	Impacts		Causes		Coping strategy
	Positive impacts	*Negative impacts*	*Immediate causes*	*Root causes*	
1. Riverbank collapse		• Loss of farmland • Loss of income	• Rising of the Mekong River	• From the dam • Climate change	• Subsidy from the Government
2. Decrease of agricultural product price		• Loss of income • Decrease of new plantation	• Long distance • Access supply	• Manmade causes	• Cultivated more rice. • Switched to cattle farming.
3. Abnormal level of the Mekong River		• Loss of fishing equipment • Lower fish catch • Dirty water • Loss of agriculture products	• Open/close of the dam spring way	• Manmade causes	• The dam owner solved the issue.
4. Reduced fish catch		• Loss of income • Buy more fish	• Abnormal level of the Mekong River	• Manmade causes	• More livestock.
5. Weather was too hot		• Health effects • Not enough water for growing crops • Cattle died	• Coal power station • Forest was destroyed • Slash-and-burn agriculture activities increased	• Manmade causes	• Consulted with village health care centre and more planting.
6. Noukee (mice) outbreak		• Loss of agriproducts • Loss of income and buy more rice	• Noukee outbreak	• Natural causes	• Try to kill the Noukee and collecting more OAAs/Ps.
7. Cattle decease		• Death of cattle and goats and loss of income	• Seasonal decease	• Natural causes	• Vaccine by the local government.

	Positive impacts	Negative impacts	Immediate causes	Root causes	Coping strategy
8. Forest burning	• More light and more convenience	• Smoke and health effects • Loss of crop • Cattle died	• Forest was destroyed • Slash-and-burn agriculture activities increased	• Manmade causes	• Strongly informed villagers to deeper their understanding of the importance of forests.
9. Install of electricity		• Pay fee	• Natural disaster	• Proposed by the head • of the village	• Constructed new and better homes, and move in with relatives.
10. Stom	• Loss of houses • Loss of plants and trees			• Natural disaster	

Table 1.1.2. Matrix of events, impacts, causes, and coping strategies, Xiengmaen Village, Chomphet District, Luang Prabang Province, Lao PDR

Events	Impacts		Causes		Coping strategy
	Positive impacts	Negative impacts	Immediate causes	Root causes	
1. Mekong riverbank collapse		• Decrease of production area • Income decrease	• Abnormal Mekong River level • Increase in navigation • Sand and gravel mining	Human activities	Seek support from local government.
2. Decreasing number of fish		• Reduced income for many HHs • Reduced food security • Reduced fish abundance	• Electric device for catching fish was widely used	Human activities	• Prohibited all electric devices for catching fish. • Impose severe punishment on using electricity for fishing.
3. Abnormal level of the Mekong		• Cannot plant • Increase cost of navigation • Loss of pump	• Opening/closing of the • dam spring-way • Climate change	Manmade causes and Natural	• The dam owner could solve the issue.

4. Loss of island area		• Loss of plant area • Loss of natural sand • Negatively affected the Lao New Year ceremony	• Opening and closing of the • dam spring-way • Sand and gravel mining	• Human activities	• Seek support from the local government.
5. Decrease in tourism		• Decrease of income • Decrease of navigation	• Tourism signage in many provinces was established but few in the provinces	• Human activities	• Propose that local government should develop more tourism sights; Develop the road to the tourism sights; and Undertake more tourism promotion.
6. Give alms to the Buddha training	• More knowledge • More income • Improve of service quality • New production	• No OAAs/Ps • Loss of income • Spend more money to buy OAAs/Ps • Decrease of fish	• Previously, almsgiving activity was not systematically organized	• Natural henomenon	• Continued to join district training on almsgiving to monks
7. Loss of OAAs/Ps			• Abnormal level of the Mekong River	• Human activities	• Did not know how to solve the issue.
8. The Mekong River flows very slowly		• Made water more dirty • Cannot fish • More oil consumption for motorboat	• Provincial authorization	• Human activities	• Inform the district authority.
9. Dry and hot weather		• Health effects • More expense for health- related issues • Loss of agricultural products	• Deforestation • Climate change		• Reforestation.
10. Village road construction	• Improve access to transportation and markets • Increased number of tourists	• Low production • High demand	• World Heritage project supported	• Human activities	
11. Rising of Agriculture products price	• Increased income • Improved well-being				

Events	Positive impacts	Negative impacts	Immediate causes	Root causes	Coping strategy
12. Forest burning	• Pollution • Loss of assets • Health effects		• Fire caused by human activity	• Human activities	• More restrictions on slash-and-burn

Table 1.1.3. The matrix of events, impacts, causes and coping, Thapathum village, Sayphouthong District, Savannakhet, Lao PDR

Events	Impacts		Causes		Coping strategy
	Positive impacts	*Negative impacts*	*Immediate causes*	*Root causes*	
1. Number of fish increased	• Income increased for many HHs • Improved food security	• HH's assets damaged	• Good natural water resources	• Natural causes	• HHs in the village donated money to help victims
2. Two houses were burned in the village			• Do not know yet	• Human activities	
3. Election of the new head of village	• Improved operation system for dealing with issues in the village		• Village regulation	• Manmade causes	
4. Building of a new temple (SIMVA)	• Increased solidity of people in village		• Preserves Lao tradition	• Manmade causes	
5. Creation of a village support fund	• Improved security of livelihoods -Increased solidity of villagers		• Village regulation	• Manmade causes	• Change fishing areas
6. Drop in fish catch in Mekong		• Reduced income for many HHs • Reduced food security	• Sand and gravel mine project	• Manmade causes	• Inform the district authority
7. Sand and gravel mining project	• Employment generated for the local people	• Riverbank collapse • Reduce fish • Reduced aquatic resources	• District authorization	• Manmade causes	
8. Building of Tamleun bridge	• Transportation is more convenient		• District authorization	• Manmade causes	• Government subsidy by offering land exempted from tax
9. Major flooding	• Fish increased	• Crop and rice loss • Income reduction • Transportation is inconvenient	• Heavy rains and Mekong River swollen	• Natural causes	• Government and entrepreneurs donated food and drink

Events	Impacts		Causes		Coping strategy
	Positive impacts	*Negative impacts*	*Immediate causes*	*Root causes*	
10. Receiving certificate of village solidarity	• Increased solidity of villagers		• Community cohesion strengthening	• Manmade causes	

Table 1.1.4. The matrix of events, impacts, causes, and coping strategy, Hongkhagnom Village, Pakse District, Champasak, Lao PDR

Events	Impacts		Causes		Coping strategy
	Positive impacts	*Negative impacts*	*Immediate causes*	*Root causes*	
1. Received the certificate of village development	• No crime or drugs • Peaceful village • Good infrastructure development		• District policy	• Manmade causes	
2. End of Buddhist Lent festival	• HHs have solidity • Trade growth		• Culture and human activity	• Manmade causes	
3. Building of new temple (SIMVA)	• Increased solidity of people in village		• Preserves a Lao tradition	• Manmade causes	
4. Mekong riverbank construction	• Protection against floods and riverbank collapse	• Restaurants across the riverbank must move out	• Government policy	• Manmade causes	• Arrange the new location for the restaurants.
5. Abandoned riverbank garden		• Reduced income of HHs • Reduced food security	• Government policy (riverbank construction against floods)	• Manmade causes	• HHs shifted to other employment.
6. Malaria disease outbreak		• Worse health conditions-- Reduced income of many HHs	• Monsoon rainfall	• Natural and manmade causes	• Health district office disseminated the method of malaria protection.
7. Flooding		• Difficulty in traveling • Disease outbreak	• Heavy rains. • Water well was not working properly	• Natural causes	• District development organization pumped water out. • Health district office disseminated information on methods of disease protection.

Events	Positive impacts	Negative impacts	Immediate causes	Root causes	Coping strategy
8. Price of coffee bean decreased		• Reduced income of HHs	• Oversupply	• Manmade causes	• Commerce district advised on coffee processing.
9. Diarrhea outbreak		• Reduced health - Reduced income of many HHs	• Weather was too hot. • Low HH awareness of hygiene	• Natural and man-made causes	• Health district office advised on the health and hygiene education
10. Two houses were burned in the village		• HH's assets damaged	• Electricity leak	• Manmade causes	• HHs in village donated money to help victims.

Table 1.1.5. Matrix of events, impacts, causes and coping strategy, Pakouay Village, Soukhouma District, Champasak, Lao PDR

Events	Impacts		Causes		Coping strategy
	Positive impacts	*Negative impacts*	*Immediate causes*	*Root causes*	
1. Sand and gravel mining		• Riverbank collapse • Water deeper and flows stronger	• District authorization	• Manmade causes	• Inform the district authority
2. Flooding	• Number of fish increased	• Crop damage. • Disease outbreak	• Heavy rains • Mekong River increased	• Natural causes	• Construction of boats and creation of a flooding warning system in the village • Dissemination of the disease protection method by health district office
3. Established village fund	• HHs have a fund for agricultural production • Improved security of livelihoods • HHs can earn interest from deposits	• Debt created for some HHs	• District policy	• Manmade causes	• Extension of the lending period to HHs in need.
4. Drought	• Convenient travel • Improved access to markets	• Crop and livestock died • Disease outbreak	• Extreme heat	• Natural causes	• Change jobs. • Village veterinarian provided advice and vaccinations
5. Village road repaired		• Travel in rainy season still difficult	• Rainfall	• Manmade and natural causes	• Collect money from HHs in the village help to repair roads.

Event	Positive effects	Negative effects	Causes	Cause type	Response
6. All HHs used latrine	• No disease outbreak -Health of HHs improved	• HHs' expenditure increased • Worsened health conditions	• Government policy	• Manmade causes	
7. Malaria disease outbreak			• Rainfall	• Manmade and natural causes	• Dissemination of the method of malaria protection by the health district office
8. Poor village eradication	• Increased income for many HHs. • Improved security of livelihoods	• HHs have a difficulty in fishing. • Fishers were fined	• Road access to village improved HHs can access to markets	• Manmade causes	
9. Mekong area preservation project (MAPP)	• Number of fish increased. • Preserved fish from extinction			• Manmade causes	• Dissemination of information on the importance of the MAPP project to local people by the head of the village
10. Fish in Mekong decreased		• Reduced income of HHs • Reduced food security	• Use of electric device for catching fish	• Manmade causes	• Punishment imposed by the head of the village to people who used electric devices to catch fish
11. Flash flooding/ drought	• Number of fish increased	• Crop damage • Disease outbreak	• Heavy rains. • Mekong River swollen.	• Natural causes	• Health district office disseminated information on disease protection methods. • District office donated food and water.
12. Death of livestock		• Reduced income of HHs • Reduced food security	• Seasonal disease outbreak. Food shortage.	• Natural causes	• Changed jobs. • Village veterinarian provided advice and vaccinations

Annexe 1.2

Table 1.2.1. Examples of event, impact, cause, and coping strategies from qualitative study in Thailand

	Event		Impact				Cause		Coping strategies			
	Event Dimension	Event Category	Impact Dimension	Poaitive Impact	Nagative impact	Impact Qualifier	Cause Dimension	Cause Category	Coping Dimension	Coping Catagory	Coping: Specification	Coping Qualifire
Ban Suan dok	3. Agriculture event	3c. High prices for agricultural products	1. Impacts on livelihood and income	1a. Increased income for many households	-	Strong	2. Manmade caused	2g. Economic situation in country	-	-	-	-
Huai thian	3. Agriculture event	3i. Plant disease	1. Impacts on livelihood and income	-	1a. Redcued income for many households	Strong	2. Manmade caused	2f. Human activity	3a. Livelihood or residence change	3a. Agricuture change	Change to disease tolerent rice variety	Change to disease tolerent rice variety
Yang ngoi	1. Even directly connected to the Mekong River or other water resources	1a. Flooding	1. Impacts on livelihood and income	-	1a. Reduces income for many households	Strong	Natural caused	1b. Mansoon rainfall	1. Getting extenal assistance	1. Additional: Get support from local governmant/ agencies	Govt (District office, Subdistrict Administrative Office, Agri Office, Fisheries Office) surveyed impacts and provided support. Villagers prepared boats and fishing equipment	Short-term (temporary)
Ban na nong bok	5. Public and private forums of support	5c. Village revived support from government	4. Impacts on access to services	4a. Improved access to services	-	Strong	2. Manmade caused	2e. Government policy	-	-	-	-
Suwan wari	1. Event directoly connextion to the Mekong River or other water resources	1k. Riverbank collape	5. Impacts on natural resources	-	5. dditional: Reduces natural resources	Strong	Natural caused	1c. Monsoon storm	-	-	-	-

Annexe 1.3

Table 1.3.1. Names and locations of villages for qualitative survey in Viet Nam, 2018

Province	Province code	Village	V. code	Sub-Zone	Terrain
An Giang	32	Binh Trung	239	FW	Floodplain
Tien Giang	38	Ap 2	232	FW	Floodplain
An Giang	32	Tan Loi	291	FW	Floodplain
Tra Vinh	40	Giong Giua	244	SW	Plain
Tra Vinh	40	Ngai Quoi	255	SW	Plain

Table 1.3.2. Main events cause positive impacts and strategies in Viet Nam

Dimension	Category	Village code	Positive impact	Specific root causes	Strategies
Agriculture event	New work opportunities	244	Increased income for many HHs, improved security of livelihoods	Coping to climate change	Seek support for linkages with markets.
	Access to agricultural machines	291	Improved access to services	Self-investment by farmers/state loans for investment	Increased state support for farmers /creation of more local jobs
	Access to agricultural machines	239	Improved access to services	Self-investment by farmers	Strengthening of support from financial institutions by credit
	New work opportunities	232	Improved knowledge and skills in fruit tree cultivation	National policy supports fruit tree development	Setting up of linkage cultivation with market
Collective village activity	Village development activity	255	Increased income for many HHs	Government support	0
Event directly connected to the Mekong River or other water resources	Construction of infrastructures	244	Improved access to services	Government support	Support provided by the government

Health	Construction of infrastructure	232	Improved access to services, improved access to sanitation	Government support	Support provided by the government for improving rural development
	Construction of infrastructure	232	Improved access to services; Improved access to sanitation	Government support	Obtain government support for improving rural development
	Construction of infrastructure	239	Improved access to services	New construction of road and bridges	Maintaining the road and bridge with local contribution
	Improved health care	239	Improved access to services	Human activities	Continuing to promote people's participation
	Improved health care	291	Improved access to services	Human activities	Continuing to promote people's participation
Public and private forms of support	Village received support from the government	244	Improved access to services	Government support	Seek more support from Government
Training and Education	Access to adult literacy training or other training	291	Improved access to services	Government support	Community monitoring

	Access to vocational training	239	Increased income for many HHs	Government support	Seek more markets for products.
	Access to vocational training	291	Increased income for many HHs	Spontaneous people / organizations to support State	Provide loans for production, increase lending and extending the period of borrowing production equipment
	Access to adult literacy training or other training	255	Improved education station	Government support	Provide loans for production, increase lending and extending periof of borrowing production equipments
Employment	Good harvest	291	Increased income for many HHs/ Improved security of ownership to productive assets	People with experience / Apply scientific and new techniques	Seek markets, training, and extension for cultivation.
	Out-migration	239	Increased income for many HHs	Social trend of the changing economic structure	Develop new local processing factory for agricultural products.
	Out-migration	291	Increased income for many HHs	Social trend of the changing economic structure/scarce land for cultivation	Develop new local processing factory for agricultural products.
	Good harvest	239	Increased income for many HHs/ improved security of ownership to productive assets	Applying good varieties	Seek market, training, and extension for cultivation
	New work opportunities	255	Increased income for many HHs/ improved security of livelihoods	Experienced people apply scientific and new techniques	Seek market, training, and extension for cultivation

Table 1.3.3. Main events cause negative impacts and coping strategies in Viet Nam

Dimension	Category	Village code	Category of negative impact	Specific root causes	Strategies
Weather related	Very hot	232	Reduced income for many HHs,	Climate change	Plant more shading trees
		291	reduced health	Climate change	Apply REDD+ and reducing exploiting natural resource
		244	Reduced health	Climate change	Provide training on livelihood activities
		239	Reduced income for many HHs	Climate change	Apply REDD+ and reducing exploiting natural resource
	Drought	255	Reduced health	Climate change	Change agricultural practices
	Hurricanes, cyclones	255	Reduced security of livelihoods, reduced income for many HHs, reduced health	Climate change	Change agricultural practices
	Long wet season	291	Reduced security of livelihoods, reduced income for many HH, Reduced health	Climate change	Protection against flooding through farmers' contribution
Agricultural event	Low prices for agricultural products	244	reduced health	Lacking market, lacking knowledge of product chains	Receive training/education from outside
		232	Reduced income for many HHs	Lacking a market, high cost of inputs	Seeking new markets, improving cropping techniques, improving the quality of products
		239	Reduced income for many HHs	Lacking market, high cost of inputs	Seeking new markets, improving cultivation techniques, improving the quality of products
		255	Reduced income for many HHs and security of livelihoods	Uncertain market	Changing agricultural practices
		291	Reduced income for many HHs	Harvesting within a short period/prices driven down by private traders, no linkage between farmers and businesses	Raise awareness of the populations, provision of state support to farmers find markets; propose Government strengthen the links between farmers and enterprises

	Plant disease	232	Reduced security of ownership to homes	Lengthen the cultivation period for fruit trees	Propose that Government should strengthen advocacy and mobilization control measures for cultivation technology
Event directly connected to the Mekong River or other water resources	High water level	255	Reduced income for many HHs, Reduced security of livelihoods	Unstable discharge of the Mekong River, climate change	Changing agricultural practices
		244	1a. Reduced income for many HHs 1b. Reduced security of livelihoods	Climate change	Changing agricultural practices
	Low water level	255	Reduced income for many HHs, reduced security of livelihoods	Unstable discharge of the Mekong River, climate change,	Changing agricultural practices
		239	Reduced income for many HHs, reduced security of livelihoods	Unstable discharge of the Mekong River	Changing agricultural practices/ construction of water sluices
	Pollution	232	Reduced security of livelihoods, decreased food security, reduced income for many HHs	Sewage from the market, investment from domestic and livestock in the riverside village from the market, investment from domestic and livestock in the riverside village	Establishing sanctions to prevent the unstable use of the natural resources
		239	Reduced security of livelihoods, decreased food security, reduced income for many HHs	Sewage from agriculture	
	Reduction of natural fish resources	239	Reduced security of livelihoods	Close the dyke system preventing migration of aquatic resources	Strengthening the legal implementation of environmental protection, mobilizing people to use water, implementing restrictions in the use of drugs in plant protection /support, using biological medicinal products

	291	Reduced other aquatic resources	Strong flow in wet season; upstream development, sand mining	Prohibiting fishing by electric shock
Riverbank collapse	255	Reduced income for many HHs	Lacking embankment, upstream development, sand mining	Obtaining support for basin cooperation, obtaining external support fund for riverbank prevention
	232	Reduced security of ownership to produce assets	Upstream development, sand mining	Obtaining support for basin cooperation, obtaining external support fund for riverbank prevention
	244	Reduced security of ownership to produce assets	Upstream development, sand mining	Obtaining support for basin cooperation, obtaining external support fund for riverbank prevention

Annexe 2. HH questionnaire in SIMVA 2018

INTRODUCTION BY INTERVIEWER

Please read aloud before starting the interview:

"Thank you for your time in providing information for this survey by the Mekong River Commission (MRC). I would like to start by providing you with some information about this survey. MRC is an organization formed by Cambodia, Lao PDR, Thailand and Viet Nam in 1995 with the aim, "To promote and coordinate sustainable management and development of water and related resources for the countries' mutual benefit and the people's well-being". MRC conducts many studies and research on water resources, and conducts socio-economic surveys and studies about people's use of water resources. MRC provides information to governments and the public that they can use for development planning.

The survey we are conducting is called 'SIMVA', i.e. the Social Impact Monitoring and Vulnerability Assessment. Its objective is to find out how people use the water resources, for example, for irrigation, navigation on rivers, or fishing, or if water resources affect people, for example, if there is flooding. More precisely, the survey seeks to find out if some people are dependent on the water resources for their livelihood and income, and if they experience problems related to water resources, and the use of water resources. Our SIMVA survey is carried out in 200 villages in the four countries, 50 villages in each country. We will interview 14 HHs in each village, and you are one of these 14 HHs.

This survey will represent all of the people who live along the Mekong River and Tonle Sap River and Lake. We will ask for your name, but this will not be entered into the database, used or shared with anyone in any way. The interview may last up to 75 minutes.

ANSWER ANY QUESTIONS THAT THE INTERVIEWEE MAY HAVE REGARDING THE SURVEY AND THE INTERVIEW

11.SECTION 1. IDENTIFIERS

1. Questionnaire ID   Number 1 – 700: Number: |_____|

2. HH ID number Number 1 – 14:   Number: |_____|

3. Village Profile ID   Number 1 – 50   Number |_____|

4. Country |_____|	5. Country Code |___|1 digit
6. Province |_____|	7. Provincial Code|_____| 2 digits
8. District |_____|	9. District Code |_____| 2 digits
10. Commune |_____|	11.Commune Code|_____| 3 digits

12. Village

14. Zone |_____|	15. .Zone Code |_____| 2 digits
16. Sub-zone |_____|	17. Sub-Zone code |_____| 2 digits

18. National village/commune ID number

|__|__ __|__ __|__ __|__ __|__ __|__ __|__ __ |

19. Urban area -------------------1

      Rural -------------------2 |_____|

      Rural without road---3 (Lao PDR only)

20. Did the HH participate in 2014 SIMVA?

      Yes ----------1   No ----------0 |_____|

21. HH ID in 2014 |_____| 22. Village ID in 2014 |_____|

23. Date of interview   /_____/_____/2018

24. Name of interviewer |_____| 25. Code of interviewer |_____|

26. Name of supervisor |_____|27.Code of supervisor |_____|

28. Interpreter employed (YES: ..1; NO: ...) |_____|

29. HH head respondent HH----1	30 If applicable, respondent 2:
If not head of HH, relation to head of HH:	HH head---1
Spouse------------- 2	Spouse------------- 2
Child----------------3	Child----------------3
Parent------------- 4	Parent-------------- 4

      |_____|
|_____|

31   Age of respondent |_____| years old

32   Respondent name |_____|

33   Respondent telephone |_____|

SECTION 2: HOUSEHOLD ROSTER AND EDUCATION

	1	2	3	4	5	6	7	8	9
MEMBER CODE	Provide names of each HH member, starting from the HH head	Gender of ..[name]..	The relationship of [name] with the head of HH?	Age of [name]?	Marital status of [name]?	Ethnicity code of [name]	Can [name] read and write?	What is the highest qualification that [name] has obtained?	Has [name] attended school during the last 12 months?
HH members are those who share accommodation and meals from 6 months or more over the last 12 months, and pool their income together and share expenditures.									
	Names are written in capital block letters	Male…1 Female2	HH head… Wife/husband… Son/daughter … Son/daughter-in-law… Father/mother Grandparent… Grandchild… Other relationships.	Age as of the month of interview Number of years	Only ask members 13 years old and above -Single -Married -Widowed -Divorced -Separated		Yes….1 No.	No qualification….. Primary…….1 Lower secondary…2 Upper secondary…..3 Vocational school……4 College, university and above…….5	Yes…..1 No….. (>>Sect. 3)
1									
2									
3									
4									
5									
6									
7									

8	
9	
10	
11	
12	
13	
14	
15	

SECTION 3: OCCUPATION

1.   MAIN AND SECONDARY occupation of family members in the last 12 months.

Instruction: Please ask about each member of HH, and then enter a '1' or '2' into the cell of occupation corresponding to each member of HH. If more than 13 HH members, use an additional questionnaire form for this information.

1= Main occupation (only one occupation);

2= Secondary occupation (one, or multiple occupations, or none, if applicable)

	Occupation	Member Code												
		1	2	3	4	5	6	7	8	9	10	11	12	13
i.	Crop farmer (incl. gardening)													
ii.	Livestock farmer													
iii.	Fishing – only fish													
iv.	Collecting OAAs/Ps													
v.	Aquaculture													
vi.	Fish processing													
vii.	Navigation – river transport													
viiii.	Sand mining from river													
ix.	Forestry													

		a. Most Important	b. Second most Important	c. Somewhat Important
x.	Permanent wage employment			
xi.	Non-farm business/trading			
xii.	Casual/seasonal work			
xiii.	Handicrafts			
xiv.	Housework			
xv.	Others (specify)			
xvi.	Not working			

SECTION 4: LIVELIHOOD ACTIVITIES IN THE PAST 12 MONTHS

		a. Most Important	b. Second most Important	c. Somewhat Important
1.	What has been the importance of the following activities for the livelihood (income, assets, resources, consumption) of your HH in the past 12 months?	a. Most Important	b. Second most Important	c. Somewhat Important
		(Tick one only)	(Tick one only)	(Multiple ticks, if applicable)
i.	Crop farming			
ii.	Livestock raising			
iii.	Fishing			
iv.	Collecting OAAs/Ps			
v.	Aquaculture			
vi.	Fish processing			
vii.	Navigation – river transport			
viii.	Sand mining from river			
ix.	Forestry			
x.	Permanent wage employment (for the government, in a factory, in a shop, etc.)			
xi.	Non-farm business/trading			
xii.	Casual/seasonal work			
xiii.	Handicrafts			

Xiv	Remittances from relatives		
Xv	Support from governments or NGOs		
Xiv	Others (specify)		
2.	Regarding the above activities: Could you please tell me if any HH member has been engaged in any of the following water-related livelihood activities in the past 12 months?	Fishing	1
		Collecting OAAs/Ps	2
		Aquaculture	3
		Irrigated farming	4
		No irrigated farming	5
		Riverbank cultivation	6
		Other, please specify	7
	Circle (multiple, if applicable)	None	8
		Don't know	99
3.	Have any HH members had to change occupation or livelihood activity in the last five years because of declined productivity in the natural resources, such as fish, other aquatic animals or collected plants?	Yes	1
		No	0 (>>6)
		DK	99 (>>6) |_____|
4.	How many member?	[_____]	

5.	What did they change to?	Shift to fishing	1
	Circle (multiple is OK)	Shift to livestock	2
		Shift to farming	3
		Shift to aquaculture	4
		Shift to employment locally	5
		Migrate	6
		Start a business	7
		Borrow money/food	8
		Depend on help from others	9
		Other (specify)	10
6	Alternative livelihood options	Shift to fishing	1
	If your HH could no longer carry out the livelihood activities you mentioned in Q1, what it do?	Shift to livestock	2
		Shift to farming	3
		Shift to aquaculture	4
		Shift to employment locally	5
		Migrate	6
	Circle up to three	Start a business	7
		Borrow money/food	8
		Depend on help from others	9
		Other (specify)	10
		Never thought about it	11

12. SECTION 5. INCOME AND ASSET

1. Could you indicate what the sources of income for the HH were in the last year? This information will be kept confidential.

No.	Source of income (in local currency)	During last month	During the last 12 months
1	Sales of own fish catch		
2	Sales of other fish catch		
3	Sale of fish from aquaculture		
4	Sale of OAAs/Ps		
5	Sale of rice		
6	Sale of other crops		
7	Sale of livestock		
8	Business (profit)		
9	Full-time employment		
10	Employment (irregular/seasonal)		
11	Pensions		
12	Remittances (money sent by relatives)		
13	Other_____		

2.	Overall, how would you say your HH income compares with five years ago? (Circle one)	Less	1
		Same	2 (>> Q.4)
		A little more	3
		Much more	4
		DK	99 (>> Q. 4)
3	Was the change related to the change in water resources? (circle one)	Yes-----	1
		No------	0
4	I would now like to ask you about the HH assets		
No.	Asset [READ list]	Quantity [Write number of assets]	

1	TV
2	Mobile phone
3	Computer
4	Fridge
5	Washing machine
6	Electric cooker
7	Motorbike
8	Car/truck
9	Tractor
10	Ox cart
11	Boat with no engine
12	Boat with engine
13	Fish equipment
14	Water tank
15	Pumping machine
16	Rice mill
17	Thresher
18	Cattle/buffalo
19	Pig/goat
20	Poultry
21	Residential land (m2) (indicate number of m2)
22	House

13.SECTION 6: VULNERABILITY

1	During the last 12 months, did the HH have any member who was sick and had to stay at the hospital/ health clinic/health centre for treatment? (circle one)	Yes............	1	No..........	0
2	How many members of the HH have health insurance?		persons		
3	What is the distance to the closest clinic?			km	
4	Which is the main drinking water supply of your HH? (circle one)				
	Dug wells	1			
	Drilled wells	2			
	Springs	3			
	River	4			
	Reservoir – hydropower	5			
	Reservoir – irrigation	6			
	Piped water	7			
	Rainwater	8			
	Bottled water	9			
	Other, please specify	10			
5	Do you treat drinking water by:				
	a. boiling? (circle one)	Yes	1	No	0
	b. a filter or chemicals? (circle one)	Yes	1	No	0

6	Which is the main source of lighting in your HH? (circle one)					
	Electricity from the national grid	1				
	Battery or generator or small-scale hydro- electricity	2				
	Gas and oil lamps	3				
	Others (specify: …….)	4				
7	Does the HH have private toilet facilities? (circle one)					
	Yes, private, clean modern toilet	1				
	Yes, private, traditional toilet	2				
	No, shared toilet with others	3				
	Have no toilet	4				
8	Is the HH considered officially poor by the Government? (circle one)					
	Yes	1	No	0	Don't know	99
9	Did your HH have enough food during the last 12 months? (circle one)	Yes	1	No	0	
10	How many meals does the HH have per day on average?			No. of meals		
11	Has the HH received the following during the last 12 months? (circle one)					
	a. Government support for poor HHs	Yes……………	1	No……………………… …….	0	
	b. Government support for natural disaster	Yes……………	1	No……………………… …….	0	
12	Does the HH (at least one member) have a bank account?	Yes……………	1	No………	0	
	(circle one)		Don't know	99		

13	Does the HH currently have a loan?				
	(circle one)	Yes.........	1	No..........	0

14	If so, who does the HH own? (multiple choices allowed)	
	Commercial banks………………….	1
	Private lenders………………….	2
	Friends or relatives………………….	3
	Microfinance groups………………….	4
	Government………………….	5
	Others, please specify………………….	6

14.SECTION 7: AGRICULTURE

1.	Has your HH cultivated any crops in the last 12 months? Circle one
	Yes =1; No; 0 (>> Q.3); Don't know= 99 (>> Q.3)
2.	If so, what are the most important crops? Rice = 1, Vegetable = 2; Industrial crops = 3; Other (specify) = 4
	Circle one
3	How many square metres of land that can be cultivated does your HH own?
	Convert local values to square metres |_____|m2
4	How many square metres did your HH actually cultivate in the last 12 months?
	Convert local values to square metres (include owned, rented, leased, used land)|_____|m2

5.	What are the main water sources for your agricultural production?
Circle (up to 3, if applicable)	- Pumped water from Mekong----------------------------1
	- Pumped water from other surface water source------------2
	- Irrigation water from Mekong: 3
	- Irrigation from other surface water source: 4
	- Pumped water from well: 5
	- Rainfed: 6
	- Other, please specify: 7
6.	Has your HH cultivated any crops on riverbanks or islands in the last 12 months? (circle one) Yes.................1; No.............. (>> Sect. 8) Don't know…99 (>> Sect. 8)
7.	If so, what is the size of the land on the riverbank or island that you cultivated?
	Convert local values to square metres |_____| square metre
8.	If so, approximately what percentage of your total riverbank or island field produce did you sell in the last 12 months? |_____|

15. SECTION 8: FISHERIES

1.	Can you confirm if anyone in your HH collected OAAs/Ps in the past 12 months?	Yes--------------------1
	Circle one	No ----------0 (>> Q. 4)
		Don't know----- 99 (>> Q. 4)

| 2 | If so, where do you or he/she normally fish during the months? |

	Month												
Tick, multiple if applicable	1	2	3	4	5	6	7	8	9	10	11	12	DK
i. Mekong mainstream													
ii. Other river/stream													

iii.	Tonle Sap Lake	
iv.	Other lake/wetlands/swamp	
v.	Rice fields	
vi.	Ponds	
vii.	Irrigation reservoir/canal	
viii.	Hydropower reservoir	
ix.	River estuary	
x	Offshore sea	
xi.	Other, please specify_____	
xii.	Don't know	

3. How often did your HH sell fish in the past 12 months?

CIRCLE ONE	More than 3 times a week	1
	2 or 3 times a week	2
	Once a week	3
	2–3 times a month	4
	Less than twice a month	5
	Never	6
	Don't know	99

4.	How often did your HH buy fish in the past 12 months? *CIRCLE ONE*	More than 3 times a week	1
		2–3 times a week	2
		Once a week	3
		2–3 times a month	4
		Less than twice a month	5
		Never	6
		Don't know	99
5.	Fish consumption – how often did your HH eat fish in the past 12 months? *CIRCLE ONE*	More than 3 times a week	1
		2–3 times a week	2
		Once a week	3
		2–3 times a month	4
		Less than twice a month	5
		Never	6
		Don't know	99
6.	Where does the fish that you consume mainly come from? *CIRCLE ONE*	Own fresh catch	1
		Own aquaculture produce	2
		Bought	3
		Own preserve	4
		Get from neighbour or relative	5
		Don't know	99
7.	How many kg of fish per person did your HH eat during the latest meal that included fish?	|_____| kg per person	

16.SECTION 9: COLLECTING OTHER AQUATIC ANIMALS AND PLANTS (OAAs/Ps)

	1.	Can you confirm if anyone in your HH collected OAAs/Ps in the past 12 months?											Yes----------- 1			
		CIRCLE ONE											No-------------0 (>>Q4)			
													Don't know-- 99 (>>Q4)			

2. If so, where do you or he/she normally collect OAAs/Ps during the following months?

		Month													
	Tick, multiple if applicable	1	2	3	4	5	6	7	8	9	10	11	12	DK
	Mekong mainstream													
ii.	Other rivers/streams													
iii.	Tonle Sap Lake													
iv.	Other lake/wetlands/swamps													
v.	Rice fields													
vi.	Ponds													
vii.	Irrigation reservoir/canal													
viii.	Hydropower reservoir													
ix.	Other													
x.	Don't know													

3.	How often did you sell OAAs/Ps in the past 12 months? (CIRCLE ONE)	More than 3 times a week	1
		2–3 times a week	2
		Once a week	3
		2–3 times a month	4
		Less than twice a month	5
		Never	6
		Don't know	99
4.	How often do you buy OAAs/Ps in the past 12 months? (CIRCLE ONE)	More than 3 times a week	1
		2–3 times a week	2
		Once a week	3
		2–3 times a month	4
		Less than twice a month	5
		Never	6
		Don't know	99

5. How many kg of OAAs/Ps per person did your HH eat during its last meal that included OAAs/Ps?

a. OAAs   **|_____| kg per person**

b. OAPs   **|_____| kg per person**

6.	Where does the OAAs/Ps that you consume mainly come from? (CIRCLE ONE)	Own fresh catch------------------------ 1
		Own aquaculture produce----------2
		Bought----------------------- 3
		Own preserve --------------------------4
		Get from neighbour or relative--------5
		Don't know---------------------------99

17.SECTION 10: FLOODING

1.	Has your HH experienced any flooding in the last 3 years? *(CIRCLE ONE)*	Yes…...1
		No….. (>> Sect. 11)
		Don't know (DK)…99 (>> Sect. 11)
2.	Did your HH lose any assets or experience any damages from flooding in the last 3 years?	Yes…...1
		No….. (>> Sect. 11)
		DK…99 (>> Sect. 11)
3.	Has your HH experienced any flooding the last 12 months? *(CIRCLE ONE)*	Yes…...1
		No….. (>> Q.16)
		DK…99 (>> Q.16)
4.	If so, did your HH lose any assets or experience any damages from flooding in the last 12 months? *(CIRCLE ONE)*	Yes…...1
		No….. (>> Q.16)
		DK…99 (>> Q.16)
5.	For how many days did the flooding last in total over the last 12 months?	|_____| Number of days **If more than one flood event, add up the number of days.**

A	Loss of agricultural production due to flooding in the last 12 months			
		(a) Paddy field	(b) Riverbank and island cultivation	(c) Aqua-culture
6.	Did you lose or suffer damages in the paddy field, riverbank and island cultivation or aquaculture production due to flooding over the last 12 months *(CIRCLE ONE)*	Yes…...1	Yes…...1	Yes…...1
		No…..	**No…..**	**No…..**
		DK…...99	**DK…...99**	**DK…...99**
7.	How many m2 were lost? (write number)	|_____|	|_____|	X
8.	What percentage of total area was lost or damaged? (between 0 and 100)	|_____|	|_____|	X

9.	What percentage of your usual production from this source was lost or damaged? (between 0 and 100)	|_____|	|_____|	|_____|
10.	What was the value of your loss (use national currency)?	|_____|	|_____|	|_____|
B	**Loss of livestock and poultry due to flooding in the last 12 months**	**a. Cattle/buffalo**	**b. Pig/goat**	**c. Poultry**
11.	Did you lose any of the following due to the flood in the last 12 months *(CIRCLE)*	Yes…...1 **No…..** **DK…...99**	Yes…...1 **No…..** **DK…...99**	Yes…...1 **No…..** **DK…...99**
12.	How many were lost?	|_____|	|_____|	|_____|
13.	What is the value of the livestock/poultry that you lost? (use national currency)	|_____|	|_____|	|_____|
C.	**Loss of other property due to flooding in the last 12 months**			
14.	Did you lose any other property due to flooding in the last 12 months? *(CIRCLE ONE)*	Yes…...1 **No…..** **DK…...99**		
15.	What is the value of other property you lost? (use national currency)	|_____|		
D.	**COPING STRATEGIES FOR IMPACTS OF FLOODING**			
16.`	What did your HH do to cope with the impacts of flooding during the last 3 years?			
	Circle, multiple if applicable			
	Started fishing			01
	Changed to farming from another activity			02
	Took on casual work in the village			03
	Found work outside the village			04
	Made goods to sell			05

Sold productive assets such as land, cattle, boats		06
Received help from family, relatives, friends		07
Received assistance from the government		08
Received assistance from an NGO or other organization		09
Borrowed money		10
Relied on non-timber forest products		11
Other		12

18. SECTION 11: DROUGHT & SALINITY INTRUSION

1.	Has your HH experienced drought in the last 3 years?	Yes…...1 No….. (>> Q16) DK…99 (>> Q16)
2.	If so, did your HH lose any assets or experience any damages from drought in the last 3 years?	Yes…...1; No….. (>> Q16) ;DK…99 (>> Q16)
3.	Has your HH experienced any drought in the last 12 months?	Yes…...1; No….. (>> Q15); DK…99 (>> Q15)
4.	If so, did your HH lose any assets due to drought in the last 12 months?	Yes…...1; No….. (>> Q15) ;DK…99 (>> Q15)

A	Loss of agricultural production due to drought in the last 12 months			
		(a) Paddy field	(b) Riverbank and island cultivation	(c) Aquaculture
5.	Did you suffer losses or damages in the paddy field, riverbank and island cultivation or aquaculture production due to drought over the last 12 months (Circle)	Yes…...1 No….. DK…...99	Yes…...1 No….. DK…...99	Yes…...1 No….. DK…...99
6.	How many m2 were lost? (write number)	|_____|	|_____|	X
7.	What percentage of the total area was lost or damaged? (between 0 and 100)	|_____|	|_____|	X
8.	What percentage of your usual production from this source was lost or damaged? (between 0 and 100)	|_____|	|_____|	|_____|

9.	What was the value of your loss (use national currency)?	|_____|		|_____|		|_____|
B	**Loss of livestock and poultry due to drought in the last 12 months**	**a. Cattle/buffalo**		**b. Pig/goat**		**c. Poultry**
10.	Did you lose any of the following due to drought in the last 12 months (Circle)	Yes…...1		Yes…...1		Yes…...1
		No…..		No…..		No…..
		DK…...99		DK…...99		DK…...99
11.	How many were lost?	|_____|		|_____|		|_____|
12.	What is the value of the livestock/poultry you lost? (use national currency)	|_____|		|_____|		|_____|
C	**Loss of other property due to drought in the last 12 months**					
13.	Did you lose any other property due to drought in the last 12 months (circle)	Yes…...1				
		No….. (>>Q15)				
		DK…...99 (>>Q15)				
14.	What is the value of other property you have lost? (use national currency)	|_____|				
D	**COPING STRATEGIES FOR IMPACTS OF DROUGHT**					
15.	If you experienced drought in the last 3 years, what did your HH do to cope with its impacts? Did you and anyone in the HH do one or more of the following:					
	Circle, multiple if applicable					
	Started fishing			01		
	Shifted to farming from another activity			02		
	Took on casual work in the village			03		
	Found work outside the village			04		
	Made goods to sell			05		
	Sold productive assets such as land, cattle, boats			06		
	Received help from family, relatives, friends			07		

	Received assistance from the government	08
	Received assistance from an NGO or other organization	09
	Borrowed money	10
	Relied on non-timber forest products	11
	Other	12
E	**Salinity intrusion (Mekong Delta)**	
16.	Have you experienced any impacts on your agricultural land or aquaculture land due to salinity intrusion in the last 12 months?	Yes……1
		No….. (>> Sect. 12)
		DK…99 (>> Sect. 12)
17.	How many m2 of your agricultural land were affected?	|_____| m2
18.	What is the value of your losses of agricultural production in the last 12 months due to salinity intrusion?	|_____| (national currency)
19.	How many m2 of your aquaculture land was affected?	|_____| m2
20.	What is the value of your losses in aquaculture production in the last 12 months due to salinity intrusion?	|_____|

19.SECTION 12: EXTREME WEATHER AND EARLY WARNING SYSTEM

A.	**Extreme Weather Events**	
1.	Has your HH experienced any weather events that you would consider out of the ordinary (extreme) in the last 3 years?	Yes------------------ 1
		No------------------- 0 (>>Q4)
		Don't know-------- 99 (>>Q4)

2.	If so, did your HH lose any assets?	Yes------------------ 1
		No------------------- 0 (>>Q4)
		Don't know-------- 99 (>>Q4)
3.	Have you experienced any of the following weather events in the last 3 years (circle, multiple choice allowed)	Typhoon --------------1
		Hail storm------------ 2
		Flash flood----------3
		Heavy rains------------- 4
		Local strong winds---------------------5
		Lightning---------------6
		Other -----------7
4.	Does your HH grow rice?	Yes------------------ 1; No------------------- 0 (>>Q8)
5.	Has your HH changed season for growing rice?	Yes------------------ 1
		No------------------- 0 (>>Q7)
		Don't know-------- 99 (>>Q7)
6.	If so, how have you changed it?	From wet season to dry season…. 01
		From dry season to wet season …2
7.	Has your HH changed the timing of growing rice?	Yes, planting earlier -----01
		Yes, planting later-------- 02
		No change ------------------03
		Don't know--------------- 99
8.	Does your HH grow other crops?	Yes------------------ 1
		No------------------- 0 (>>Q10)

9.	Has your HH changed any crop, or crop variety, due to the following reasons? (Select all that apply)	Yes, due to floods---------------------------------------1 Yes, due to drought-----------------------------------2 Yes, due to increasing temperatures -------------3 Yes, due to falling temperatures--------------------4 No, has not changed crops ------------------------5 Changed crops for other reasons------------------6
A.	Early Warning System	
10.	Is there a way that your HH can know if a flood is coming? (circle one)	Yes------------------ 1 No------------------- 0 (>>Q12) Don't know-------- 99 (>>Q12)

11.	How reliable is the information you get from the following Tick one for each row	a. Not available	b. Not reliable	c. Reliable	d. Highly reliable	e. Don't know
i.	Radio					
ii.	TV					
iii.	SMS					
iv.	Radio speaker in the village					
v.	Local knowledge					
vi.	Person-to-person					
vii.	Internet					
viii.	Other					

| 12. | To prevent impacts from floods and droughts what would your HH do?

Please select up to 3 options

 Circle up to 3 | Shelter and sanitation------------------------------1

Store food and drink----------------------------------2

Improve transportation and communication -------3

Get support from outside-------------- ------------------4

Other---5

Do nothing---6

Don't know--99 |

THANK YOU VERY MUCH – THE INTERVIEW IS OVER

REMARKS

| 13. | Interviewer's remarks |

| 14. | Field supervisor's remarks |

Annexe 3. Village profile data collection form SIMVA 2018

Introduction by the Field Survey Team

"Thank you for giving your time to provide some information to this survey by the Mekong River Commission (MRC). I would like to start by giving you some information about this survey. MRC is an organization that was established by Cambodia, Lao PDR, Thailand, and Viet Nam in 1995 with the purpose: "To promote and coordinate sustainable management and development of water and related resources for the countries' mutual benefit and the people's well-being". MRC works in the whole Mekong River Basin, which is the large area where rivers and streams flow down into the Mekong – from the border of Lao PDR and China, and all the way down to the Mekong Delta in Viet Nam.

MRC conducts many studies and research on water resources as well as socio-economic surveys and studies on people's use of water resources. MRC provides information to governments and the public that they can use for development planning.

This survey we are conducting is called 'SIMVA', which means Social Impact Monitoring and Vulnerability Assessment. Its SIMVA purpose is to find out how people use the water resources, for example. for irrigation, navigation on the rivers, or fishing, or if water resources affect people, for example if there is flooding. More precisely, the survey will try to find out if some people are dependent on the water resources for their livelihoods and income, and if they experience problems related to water resources, and the use of water resources.

Our SIMVA survey is carried out in 200 villages in the four countries, 50 villages in each country. We will interview 14 HHs in each village and interview village leaders and village/commune officials on the situations in the village.

We will ask for your name, but this will not be entered into the database or used or shared with anyone in any way.

It should take about 1 hour to finish the interview.

Please ask any question you may have before we start."

VILLAGE PROFILE DATA COLLECTION FORM SIMVA 2018

20.SECTION 1: IDENTIFIERS				
1.	Village Profile ID	Number (1–50)	Number: |__ __|	
2.	GPS Coordinates: 2a. Latitude |-- -- --| 2b. Longitude |--- -- --|			
3	Country	|_____|	4	Country ID	|__ __|
5.	Province	|_____|	6.	Provincial ID	|__ __|
7.	District	|_____|	8.	District ID	|__ __|
9.	Commune	|_____|	10.	Commune ID	|__ __|
11.	Village	|_____|	12.	Village ID	|__ __|
13.	Zone	|_____|	14.	Zone ID	|__ __|
15.	Sub-zone	|_____|	16.	Sub-Zone ID	|__ __|
17.	National Village/Commune ID number			
	|__|__ __|__ __|__ __|__ __|__ __|__ __|__ __			

18.	Village category	Urban------------------------1
	(Circle the number)	Rural------------------------ 2
		Rural without roads---------3 (Lao PDR only)
19.	Was the village surveyed in SIMVA 2014?	
	(circle one)	Yes------1 No------0
20.	Village ID in 2014	|__ __| digits
21.	Date of interview	/_____/_____/2018
22.	Name of interviewer	|_____| 23. Code of interviewer |_____|
24.	Name of supervisor	|_____| 25. Code of supervisor |_____|
26.	Name of respondent 1	|_____| 27. Position of respondent 1 |_____|
28.	Name of respondent 2	|_____| 29. Position of respondent 2 |_____|
30.	Name of respondent 3	|_____| 31. Position of respondent 3 |_____|
32.	Key respondent or other telephone, if available	|_____|

SECTION 2: VILLAGE CHARACTERISTICS

1. What is the topographical location of this village?	**Floodplains1**
Multi-selection, if applicable	Hills/mountain 2
(Circle the number)	Plateau 3 Other, specify:
Valley	4
Riverbank	5
Lake/wetland	6
Delta	7
Coast	8
Plains	9
Other, please specify	10
2. What is the total areas of the village?	|_____| ha

SECTION 3: POPULATION AND LIVELIHOODS

1.   Number of HHs in village |_____|

2.   Total population |_____|Actual population

3.   Female population|_____|Actual population

4.   What are the 4 main livelihoods of the villagers?

Circle the 4 most important livelihood activities.

Crop farming	1 Other, specify:
Livestock raising	2
Fishing	3
Collecting OAAs/Ps	4
Aquaculture	5
Fish processing	6
Navigation – river transport	7
Sand mining from river	8
Forestry	9
Non-farm business/trading	10
Casual/seasonal work	11
Handicrafts	12
Industry/mining	13
Service sector	14
Remittances from relatives	15
Support from governments or NGOs	16
Others (specify)	17

SECTION 4: LABOUR MOBILITY

1. Do some people who are registered in this village sometime work outside it? Circle one	Yes…….. 1 No………0 (>> Section 5)	
2. How many persons would you estimate work outside the village?	|_____| persons	
3. Where do people mostly travel to work? *Circle one*	Other village, same district--------------------	1
	Other district or province---------------------	2
	Country capital------------------------	3
	To another country-----------------------	4
	Other, please specify--- --------------------	5

4. Do some people travel outside the village to fish in other fishing areas? *Circle one*	Yes---------1 No----------0 (>>Q. 7)	
5. If so, how many HHs have members who travel to fish in fishing areas outside?	Estimated number of HHs: |_____|	
6. For how long are people typically away from the village to fish in other fishing areas? *Circle one*	a. Less than 1 month b. 1–3 months c. 3–6 months d. More than 6 months	
7. Do some people travel outside the village for aquaculture? *Circle one*	Yes---------1 No----------0 (>> Sect. 5)	
8. If so, how many HHs have members who travel outside the village for aquaculture?	Estimated number of HHs: |_____|	
9. For how long are they typically away from the village for aquaculture? *Circle one*	a. Less than 1 month b. 1 - 3 months c. 3 - 6 months d. More than 6 months	

SECTION 5: VILLAGE RESOURCES AND SERVICES

a.	**Drinking water supply**	
1.	How many HHs use the different source of drinking waters listed below?	Estimated percentage of HHs using source of drinking water:
i.	Dug wells	|_____|
ii.	Drilled wells	|_____|
iii.	Springs	|_____|
iv.	River	|_____|
v.	Reservoir – hydropower	|_____|
vi.	Reservoir – irrigation	|_____|
vii.	Piped water	|_____|
viii.	Rainwater	|_____|
ix.	Bottled water	|_____|
x.	Other, please specify	|_____|
2.	Do the following water sources have water in the wet and /or dry season? *Yes---------1; No----------0* *If you don't know or information is not available, write 99*	a. Wet season b. Dry season

i.	Dug wells	
ii.	Drilled wells	
iii.	Springs	
iv.	River	
v.	Reservoir – hydropower	
vi.	Reservoir – irrigation	
vii.	Piped water	
viii.	Rainwater	
ix.	Other	

b.   **Village public and private services**

	3. Which of the following facilities and activities are available in your village, and what condition are they in, if they are available? *Tick off only 1 per service*	Condition						
		1: Very Bad	2: Bad	3: Neutral	4: Good	5: Very Good	6: Don't know	7: Not available
i.	Electricity source – grid							
ii.	Electricity source – generator							
iii.	Telephone/mobile connection							
iv.	Internet							
v.	Primary school							
vi.	Secondary school							
vii.	Middle/high school							
viii.	Health centre/clinic/drugstore/pharmacy							
ix.	Feeder road							
x.	Pier/jetty/landing place for boats							
xi.	Agricultural produce storage (collective)							
xii.	Fish processing facilities							
xiii.	Ice factory							
xiv.	Market for vegetables							
xv.	Market for selling aquaculture produce							
xvi.	Market for selling locally caught fish							
xvii.	Agricultural extension/training							
xviii.	Aquaculture extension/training							
xix.	Conservation/natural resource management training							
xx.	Health care training/facilitation							
xxi.	Literacy training							

SECTION 6: WATER-RELATED INFRASTRUCTURE

1.	What kind of water-related physical infrastructure is there in the village area? *Circle, multiple selections if applicable.*	Irrigation dam	1
		Hydropower dam	2
		River training structures (flow)	3
		Riverbank protection	4
		River dyke	5
		Weir	6
		Bridge over water	7
		None	8
		Other, please specify	9
2.	How many HHs have a boat (excluding motorboats)?	Number |_____|	
3.	How many HHs have a motorboat?	Number |_____|	
4.	How many HHs have any fishing gears?	Number |_____|	
5.	How many HHs in your village have the following fishing gears? *Enter the number for each, as applicable, or write "DK" if you don't know*	-	
i.	Gillnet	|_____|	
ii.	Casts net	|_____|	
iii.	Spear	|_____|	
iv.	Small trap	|_____|	
v.	Hook	|_____|	
vi.	Large trap	|_____|	
vii.	Scoop net	|_____|	
viii.	Dai	|_____|	
ix.	Lift net	|_____|	
x.	Trawl	|_____|	
xi.	Other, please specify	|_____|	

SECTION 7: RIVERBANKS, ISLAND GARDENS AND FIELDS

6.	Have any HHs in the village riverbanks, island gardens and fields ? *Circle one*	Yes------------1
		No-------------2 (>> Sect. 9)
	-	Don't know--99 (Sect. 9)

7.	If yes to Q6, who mainly owns the riverbank and island gardens and fields?	Privately owned---------------	1
		Village common ---------------	2
		Government land ---------------	3
		Combination of the above-----------------	4
	Circle one	Other, specify-------------------	5

8.	If yes to Q6, how many HHs have riverbanks, island gardens and fields, and how big are they?	Enter the number of HHs that have riverbanks, island gardens and fields	-
	Sizes of:	Estimated number of HHs	
i.	Less than 50 m2		
ii.	51 m2 – 400 m2		
iii.	401 m2 – 800 m2		
iv.	More than 800 m2		
9	Total area of all riverbanks, island gardens and fields in the village	|_____| ha	

SECTION 8: FLOODING

1.	Has there ever been flooding in the village?	Yes	1
	Circle one	No	0 (>> Sect. 10)
		Don't know	99 (>>Sect. 10)
2.	If yes to Q1, when was the latest flood in the village?		
		a. Year|_____|	
		b. Month|____|	
3.	**Has the village experienced any losses or damages from any floods in the last 3 years?**	Yes	1
		No	0 (>> Sect. 10)
		Don't know	99 (>>Sect. 10)
4.	Have any HHs in the villages experienced losses or damages from any floods in the last 3 years? (Circle one)	Yes	1
		No	0 (>> Q5)
		Don't know	99 (>>Q5)
4a.	If so, how many?	|_____| HHs	
5.	Has the village experienced flooding in the last 12 months?		
		Yes	1

| Circle one | No | 0 (>> Sect. 10) |
| | Don't know | 99 (>>Sect. 10) |

6	How large an area did the most serious flooding in the last 12 months cover and for how long?					
		A	B	C	D	E
	Only 1 tick per row.	Less than 2 weeks	2 weeks to 1 month	1 month to 2 months	More than 2 months	Flash flood
i.	Less than 1 ha					
ii	1 to 2 ha					
iii.	3–5 ha					
iv.	5–10 ha					
v.	More than 10 ha					

7.	What was the cause of the most serious flooding in the last 12 months?		
		River overflow	1
		Lake overflow	2
		Canal overflow	3
	Circle, multiple if applicable	Rainwater could not drain away	4
		Dam overflow	5
		Other, specify	6
		Don't know	99

8.	What were the sources of the most serious flooding in the last 12 months?		
		Normal rains/monsoon	1
		Extended monsoon	2
		Extreme weather/typhoon	3
		Hydropower reservoir release	4
	Circle, multiple if applicable	Other	5
		Don't know	99

9.	How were the impacts of the most serious flooding in the last 12 months		
	compared to earlier years?	Much worse	1
		Worse	2
		Same	3
		Less	4
	Circle one	Much less	5
		Don't know	99

10.	Was there any loss of assets or human or animal life from flooding in the last 12 months?		
		Yes	1
	Circle one	No	0 (>> Sect. 10)

| | | Don't know | | | | | | | | | 99 (>>Sect. 10) |

11. How many HHs experienced damages or losses?

Only 1 tick per row for losses and one for damages.

		A: 2 or less HHs		B: 3–5 HHs		C: 6–10 HHs		D: 10–30 HHs		E: More than 30 HHs	
		Loss	Damage	Loss	Damage	Loss	Damage	Loss	Damage	Loss	Damage
i.	Cropland										
ii.	Houses										
iii.	Aquaculture										
iv.	Human life										
v.	Cattle										
vi.	Buffalo										
vii.	Pigs and goats										
viii.	Chickens and ducks										
ix	Other, please specify										

SECTION 9: DROUGHT

1.	Has there ever been drought in the village?	Yes	1
	Circle one	No	0 (>> Sect. 11)
		Don't know99	99 (>>Sect. 11)

2.	If yes to Q1, when was the latest drought in the village?		
		a. Year |_____| b. Month |_____|	

3.	Has the village experienced any losses or damages from any drought in the last 3 years?		
		Yes	1
	(Circle one)	No	0 (>> Sect. 11)
		Don't know	99 (>>Sect. 11)

4.	Have any HHs in the villages experienced losses or damages from any drought		
		Yes	1
	in the last 3 years? (Circle one)	No	0 (>> Q5)
		Don't know	99 (>>Q5)

| 4a. | If so, how many HHs? | |_____| HHs |

5.	Has the village experienced drought in the last 12 months?		
		Yes	1
		No	0 (>> Sect. 11)
		Don't know	99 (>>Sect. 11)

6.	How long did the most serious drought in the last 12 months last?		
		1 to less than 2 months	1
		2 up to 3 months	2
	Circle one	More than 3 months	3

7.	What were the sources of the most serious drought in the last 12 months?		
		Extreme weather/ Climate change	1
		Extended dry season	2
		High demand of water for rice cultivation	3
	Circle, multiple if applicable	High demand of water for aquaculture	4
		Others	5
		Don't know	99

8.	How were the impacts of the most serious drought in the last 12 months compared to earlier years?		
		Much worse	1
		Worse	2
		Same	3
		Less	4
	Circle one	Much less	5
		Don't know	99

SECTION 10: SALINITY INTRUSION

1.	Has there ever been salinity intrusion in the village?		
		Yes	1
	Circle one	No	0 (>> Sect. 12)
		Don't know	99 (>>Sect. 12)
2.	If yes to Q1, when was the latest salinity intrusion in the village?	a. Year|_____| b. Month|_____|	
3.	Has the village experienced any losses or damages from any salinity intrusion		
	In the last 3 years?	Yes	1
	(Circle one)	No	0 (>> Sect. 12)
		Don't know	99 (>>Sect. 12)
4.	Have any HHs in the villages experienced losses or damages from any		

	salinity intrusion in the last 3 years? (Circle one)	Yes	1
		No	0 (>> Q5)
		Don't know	99 (>>Q5)
4a.	If so, how many?	|_____| HHs	
5.	Has the village experienced salinity intrusion in the last 12 months?		
		Yes	1
		No	0 (>> Sect. 12)
		Don't know	99 (>>Sect. 12)
6.	How long did the most severe salinity intrusion in the last 12 months last?		
		1 to less than 2 months	1
	Circle one	2 up to 3 months	2
		More than 3 months	3
7.	How were the impacts of the most serious drought in the last 12 months compared to five years ago?		
		Much Worse	1
		Worse	2
		Same	3
		Less	4
	Circle one	Much less	5
		Don't know	99

SECTION 11: ADAPTATION

1	Has the village carried out any activities in the past to prevent weather or climate-related disasters or impacts?		
		Yes	1
	Circle one	No	0 (>> Q.3)
		Don't know	99 (>>Q.3)
2.	If so, what kind of adaptation activities ?		
	(Circle, multiple choices allowed)		
	Building dykes	1	
	Constructing water regulating infrastructure	2	
	Awareness raising	3	
	Changing crops/cropping patterns	4	
	Protecting infrastructure	5	

	Organized community around adaptation	6	
	Other, please specify	7	

3. Is there a village development plan?

Circle one	Yes	1	
	No	0 (>> Q.5)	
	Don't know	99 (>>Q.5)	

4. If so, does the Plan include climate change adaptation measures?

Circle one	Yes	1	
	No	0 (>> Q.5)	
	Don't know	99 (>>Q.5)	

5. Does the village get the requests or funds from the commune or District to

carry out climate change adaptation activities?

	Yes		
	No	0 (>> End)	
	Don't know	99 (>> End)	

6   If so, what kind of activities were carried out?

|_____|

THANK YOU VERY MUCH – THE INTERVIEW IS OVER

Interviewer's remarks

Observations on cooperation, village situation, reliability of information, etc., if any.

6.

|_____|

|_____|

|_____|

Annexe 1. List of events that occurred in the 5 villages

Village code	Events
232	Improved rural pathway
232	Moved dyke further inwards
232	Riverbank collapse
232	Environmental pollution
232	Low price of fruits

232	Training on fruit tree cultivation
232	Plant disease
232	High temperatures
291	Riverbank collapse
291	Job training
291	Good rice harvest
291	Low prices of agriculture products
291	Find new jobs
291	New technology in agriculture
291	Improved health care
291	Training and education
291	Long wet season
291	Hot temperatures
244	Riverbank collapse
244	Low prices of agriculture products
244	Intrusion of salinity
244	Repair of the primary school building
244	Upgrading the clinic station
244	Training for aquaculture
244	Very hot temperatures
255	Low groundwater level
255	High tidal
255	Riverbank collapse
255	Unstable prices of agriculture products
255	Development of dry crops
255	Maintenance of irrigation systems
255	National standard primary school
255	Long period of sunshine – drought
255	Hurricanes, cyclones
239	Low water level
239	Reduction of natural fish resources
239	Construction of road and bridges
239	Environmental pollution
239	Find new jobs
239	Good rice harvest
239	Low price of agriculture products
239	New agricultural technology

239	Job training
239	Improved health care
239	Hot temperatures

Annexe 4. List of events directly connected to the Mekong River or other water resources that impacted the villages positively and negatively

Village code	Event Key Words					Impact Key Words			
	Dimension (select from list)	Category (select from list)	Specification (Key Words by Study Team based on notes)	Qualifier: Normal or extraordinary; expected or unexpected (select from list)	Qualifier: Timing, duration (select from list)	Dimension (select from list)	Category – positive impact (select from list)	Category – negative impact (select from list)	Specification (Key Word by Study Team based on notes)
232	Event directly connected to the Mekong River or other water resources	Construction of infrastructure	Improved rural pathway	Expected	Normal timing – it occurred at a normal time	Impacts on livelihood and income	4a. Improved access to services 4c. Improved access to sanitation		Reduced benefit of flood, accumulation of chemical toxins from agriculture
232	Event directly connected to the Mekong River or other water resources	Construction of infrastructure	Improved rural pathway	Expected	Normal timing – it occurred at a normal time	Impacts on livelihood and income	4a. Improved access to services 4c. Improved access to sanitation		Reduced benefit of flood, accumulation of chemical toxins from agriculture
232	Event directly connected to the Mekong River or other water resources	Riverbank collapse		Unexpected	Normal timing – it occurred at a normal time	Impacts on livelihood and income		1b. Reduced security of ownership to produce assets	Damaged fruit tree
232	Event directly connected to the Mekong River or other water resources	Pollution	Water pollution	Unexpected	Normal timing	Impacts on food and health		Reduced security of livelihoods, decreased food security, reduced income for many HHs	Lacking fresh water for domestic use and irrigation

239	Event directly connected to the Mekong River or other water resources	Low water level	Low water level	Above normal level and extent	Longer than normal duration	Impacts on livelihood and income	0	Reduced income for many HHs, reduced security of livelihoods	Lacking water for irrigation
239	Event directly connected to the Mekong River or other water resources	Reduction of natural fish resources	Unexpected	0	Unexpected	Impacts on food and health	0	Reduced security of livelihoods	Reduced security of livelihoods
239	Event directly connected to the Mekong River or other water resources	Construction of infrastructure	Construction of road and bridges	Expected	Normal duration	Impacts on access to services	Improved access to services	0	More exchange of goods, reduced negative impact from private business
239	Event directly connected to the Mekong River or other water resources	Pollution	Water pollution	Unexpected	Normal timing	Impacts on food and health	0	Reduced security of livelihoods, decreased food security, reduced income for many HHs	Lack of fresh water for domestic use and irrigation, which caused of many diseases for women
244	Event directly connected to the Mekong River or other water resources	Riverbank collapse		Unexpected	Normal timing	Impacts on livelihood and income		Reduced security of ownership to produce assets	Damaged fruit tree
244	Event directly related to the Mekong River or other water resources	1c. High water level	Intrusion of salinity	Unexpected	Higher saline water than normal	1. Impacts on livelihood and income	0	Reduced income for many HHs;	

1b. Reduced security of livelihoods	Reduced security of livelihood and income of HHs								
244	Event directly connected to the Mekong River or Other water resources	1i. Construction of infrastructures	0	4.Expected	1.Normal timing	4.Impacts on access to services	4a. Improved access to services	0	More educational opportunities for adults
255	Event directly connected to the Mekong River or other water resources	Low water level	Low groundwater level	Perceived as a Shock	Longer than normal duration	Impacts on livelihood and income	0	Reduced income for many HHs, Reduced security of livelihoods	0
255	Event directly connected to the Mekong River or other water resources	High water level	High tides	Unexpected	Higher tidal than normal	Impacts on livelihood and income	0	Reduced income for many HHs, reduced security of livelihoods	0
255	Event directly connected to the Mekong River or other water resources	Riverbank collapse	Riverbank collapse	unexpected	unexpected	Impacts on natural resources	0	Reduced income for many HHs	0
291	Event directly connected to the Mekong River or other water resources	Riverbank collapse	Yearly, riverbank collapse in the wet season	Above normal level and extent	Longer than normal duration	Impacts on natural resources	0	Reduction of other aquatic resources	Loss of productive land /loss of wealth

Annexe 5. Calculation results of the survey

Table 29. Topography of the sample villages (%)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Floodplain	30	23	11	72	16
Hills/mountain	7	6	9	14	0
Plateau	28	30	28	54	0
Valley	5	0	19	2	0
Riverbank	28	13	29	58	10
Lake/wetland	3	6	0	2	2
Delta	0	0	0	0	0
Coast	1	0	0	0	4
Plains	38	21	2	62	68
Other	11	1	2	42	0

Table 30. Drinking water supply (%)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Bottled water	50	21	86	79	16
Piped water	33	10	2	52	67
Drilled well	20	18	11	52	0
Rainwater	11	13	5	20	7
Dug well	14	14	13	21	9
Other	21	10	74	0	0
River	6	20	5	0	1
Spring	10	0	42	0	0

Table 31. Labour mobility in the area

No	Items	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
1	**Villages have people who work outside the village (% village)**	98	100	94	100	98
2	**Location mostly travel to work (%)**	100	100	100	100	100
	Other villages, same district	7	10	9	4	6
	Other district or province	43	36	32	14	88
	Country capital	31	32	11	78	4

	To another country	18	22	47	4	0
	Other	1	0	2	0	2
3	Villages have people work outside for fishing (%)	77	70	79	86	72
4	Duration that people typically migrate to fish (%)	100	100	100	100	100
	Less than 1 month	81	53	100	86	86
	1–3 months	7	13	0	0	14
	3–6 months	7	27	0	0	0
	More than 6 months	5	7	0	14	0
5	People migrate for aquaculture (%)	10	8	8	6	18
6	Duration that people typically migrate for aquaculture	100	100	100	100	100
	Less than 1 month	22	25	50	100	11
	1–3 months	0	0	0	0	0
	3–6 months	46	75	0	0	11
	More than 6 months	32	0	50	0	78

Table 32. Village public and private services (%)

	Very bad	Bad	Neutral	Good	Very good	Don't know	N/A
Electric source – grid	0	5.5	30.5	46.5	12.5	0	5
Electric source – generator	0.5	1.5	9	13.5	0.5	3	72
Telephone/mobile connection	1.5	3.5	28.5	47.5	15.5	0.5	3
Internet	3	10	35.5	34	6.5	2	9
Primary school	0	2	18	44	10	0	26
Secondary school	0.5	2.5	8	21	4	0	64
Middle/high school	0.5	4	4.5	7.5	1.5	0	82
Health centre/clinic/drugstore/ pharmacy	1.5	4.5	10	26.5	4.5	1	52
Feeder roads	5	12	34.5	35.5	9	0.5	3.5
Pier/jetty/landing places for boats	0.5	2	6.5	9	2	0.5	79.5
Agriculture produce storage	1.5	1	2	3.5	1	0.5	90.5
Fish processing facilities	0.5	0	1	0	0	1	97.5

Ice factory	2	3	6	7.5	1	0.5	80
Market for vegetables	2	5.5	12.5	13	1.5	0.5	65
Market for selling aquaculture produce	1.5	4	6.5	8	1	1	78
Market for selling locally caught fish	1.5	4.5	12.5	12	1.5	1	67
Agriculture extension/training	0.5	4.5	26.5	37	8	1	22.5
Aquaculture extension/training	0.5	5	16.5	14	2.5	1.5	60
Conservation/natural resource management training	0	4.5	19.5	29.5	5	2	39.5
Healthcare training/facilitation	0	1	19	53	11	1.5	14.5
Literacy training	0	2	17	23.5	5	1.5	51

Table 33. Riverbank and garden fields

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
HHs in the village that have riverbanks, island gardens and fields (%)	68	94	52	50	78
Average areas of riverbank and garden fields (ha)	157	495	60	38	34
Average HH has less than 50 m2 (%)	5	2	13	2	4
Average HH has 51–400 m2 (%)	13	10	30	3	8
Average HH has 401–800 m2 (%)	15	29	22	2	8
Average HH has more than 800 m2 (%)	53	146	20	16	29
Who owns the riverbanks, island gardens and fields (%)?					
Privately owned	66	96	67	24	78
Village owned	8	2	31	0	0
Government land	20	2	3	76	0
Combination of the above	6	0	0	0	22
Average area of riverbank (ha)	186	495	60	38	34

Table 34. Losses and damages from flooding experienced of by villages in the last 12 months (%)

Answers	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Yes	67	70	81	87	42
No	30	30	4	13	58
Don't know	3	0	15	0	0
Total	100	100	100	100	100

Table 35. Most serious types of flooding in the last 12 months (% villages reported)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
River overflow	56	52	84	68	22
Lake overflow	0	0	0	0	0
Canal overflow	22	0	45	0	42
Rainwater could not drain away	55	36	60	82	42
Dam overflow	8	8	19	6	0
Other	4	6	0	9	0

Table 36. Sources of most flooding in the last 12 months (%)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Normal rain/ monsoon	34	41	16	79	42
Extended monsoon	20	5	52	24	2
Extreme weather/ typhoon	11	23	14	6	6
Hydropower reservoir release	13	23	14	15	0
Other	5	9	0	9	8

Table 37. Impacts of the most serious flooding (%)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Much worse (than the last five-year period)	25	6	58	32	2
Worse (than the last five-year period)	25	50	21	9	20
Same	15	0	5	35	18
Less	18	38	11	24	2
Much less	2	6	5	0	0
Don't know	15	0	0	0	58

Table 38. Experience of drought in the last 12 months (%)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
1 to less than 2 months	56	36	71	38	78
2 up to 3 months	34	45	29	48	14
More than 3 months	10	18		14	8

Table 39. Sources of drought (%)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Extreme weather/ climate change	48	72	77	24	20
Extended dry season	46	10	92	62	20
High demand of water for cultivation	13	17	15	19	2
High demand of water for aquaculture	1	0	0	5	0
Others	7	0	10	0	18

Table 40. Trends in impacts of drought (%)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Much worse (than the last five-year period)	16	18	15	29	0
Worse (than the last five-year period)	27	36	46	10	16
Same	19	5	15	52	2
Less	16	41	15	10	0
Much less	2	0	8	0	0
Don't know	20	0		0	82
Total	100	100	100	100	100

Table 41. Measures to adapt to climate change impacts (% of village reported)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
1. The percentage of sample villages have carried out some activities to prevent weather or climate-related disasters or impacts (%)	66	42	47	86	88
2. Adaptation activities have been carried out (%)					
Building dykes	20	5	6	24	46
Constructing water regulating infrastructure	7	3	6	0	18
Awareness raising	60	36	35	72	98
Adapt crop production	14	13	13	24	4
Protecting infrastructure	9	8	6	8	12
Organizing the community around adaptation	21	36	18	28	2
Other	10	0	15	22	2
3. Number of village development plans	150	35	25	49	41
4. Number of the village development plans covering climate change adaptation measures	128	15	25	33	41

Table 42. Dependency ratio, 2011, 2014 and 2018, by country (%)

Year	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
2011	32.0	35.1	34.2	33.3	25.5
2014	35.3	38.8	37.1	35.6	29.8
2018	31.2	34.5	27.7	35.8	26.8

Table 43. Education levels of HHHH (%)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
No qualification	12.0	27.0	0.3	19.4	4.6
Primary school	39.2	42.4	11.9	55.3	39.1
Lower secondary school	33.2	25.6	39.8	6.6	38.8
Upper secondary school	12.2	4.4	34.7	13.8	13.7
Vocational school	1.2	0.1	9.4	1.8	0.8
College, university and above	2.3	0.5	4.0	3.2	3.0

Table 44. Marital status of head of HH (%)

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Single	3	1	1.6	5	1.5
Married	85	87	86	77	89
Widowed	9	10.6	10	13	8
Divorced	2	1	3	4	1
Separated	1	0.4	0.4	1	0.5

Table 45. Comparison of the main and second occupation in the past 12 months in the 2018 and 2014 surveys

Livelihoods	Most important (HHs)		Second most important (HHs)	
	2018	2014	2018	2014
Crop farming	45.9	68.5	16.4	8.5
Permanent wage employment	9.9	7	9	14.5
Non-farm business/trading	5.5	5.6	4.2	8.1
Casual/seasonal work	4.5	5.5	9.1	10
Handicrafts	0.8	1.1	1.1	3.6

Remittances from relatives	1.7	N/A	2.7	N/A	
Support from governments or NGOs	0.5	N/A	1.8	N/A	
Others	2.8	0.8	15.4	0.7	
Livestock raising	1.6	4.3	9.1	30.2	
Fishing	2.7	2.4	4.2	9.1	
Collecting OAAs/Ps	0	0.1	0.8	1.3	
Aquaculture	0.8	0.8	2.6	2.2	
Fish processing	N/A	N/A	0	0.2	
Navigation	N/A	0.2	0	0.2	
Forestry	0.1	N/A	0.2	0.1	
None	0	N/A	N/A	N/A	

Table 46. A comparison of indicators of fishing and collecting OAAs in the 2018, 2014 and 2011 surveys (%)

	Year	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
% of HHs whose most important livelihood is fishing	2011	1.3	3.1	0.1	1.6	0.3
	2014	2.4	6.3	0.4	0.6	2.3
	2018	2.7	8.3	0.0	1.1	1.4
% of HHs whose second most important livelihood is fishing	2011	5.2	10.0	1.9	9.0	0.0
	2014	9.2	8.7	7.3	16.1	2.8
	2018	4.2	7.9	0.0	8.9	0.0
% of HHs that fished in the last 12 months	2011	44.4	55.9	61.2	49.7	10.7
	2014	49.9	57.6	69.2	59.4	13.5
	2018	36.4	44.9	46.4	46.3	8.0
% of HHs that collected OAAs in the last 12 months	2011	50.5	69.4	61.0	44.6	26.8
	2014	60.5	70.1	67.0	58.3	46.7
	2018	36.3	29.0	44.0	49.0	23.0

Table 47. HH income during the last month by source (US$/HH)

	Sources of income	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
1	Own fish catch	85.9	101.6	44.7	74.1	123.0
2	Sale of other's fish catch	295.6	474.9	261.1	214.8	231.6
3	Aquaculture	276.5	144.6	147.7	517.4	296.1

No	Sources of income	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
4	Sale of OAAs/Ps	53.9	38.6	23.1	108.0	45.9
5	Sale of rice	352.6	330.9	80.3	627.2	372.2
6	Sale of other crops	245.5	95.5	164.9	460.3	261.3
7	Sale of livestock	227.2	192.1	132.4	439.2	145.3
8	Business (profit)	467.7	975.1	434.3	274.2	187.4
9	Full-time employment	341.0	372.5	349.9	339.4	302.1
10	Employment (irregular/seasonal)	234.5	141.5	281.3	279.2	235.8
11	From pensions	180.7	107.5	227.2	168.7	219.4
12	Remittances	134.0	121.7	136.2	124.6	153.7
13	Other sources	118.7	185.9	107.8	62.6	118.5

Table 48. HH income during the year before the survey (2017), by source (US$/HH)

No	Sources of income	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
1	Own fish catch	623	691	509	344	950
2	Sale of other's fish catch	2,148	4,844	196	1,753	1,801
3	Aquaculture	2,095	1,148	818	1,017	5,395
4	Sale of OAAs/Ps	407	172	266	377	812
5	Sale of rice	1,205	809	674	1,082	2,256
6	Sale of other crops	1,801	1,157	1,791	2,386	1872
7	Sale of livestock	974	538	759	1,500	1,100
8	Business (profit)	2,872	2,686	4537	2,226	2,038
9	Full-time employment	3,735	3,837	3,934	3,670	3,450
10	Employment (irregular/seasonal)	1,553	794	2,425	1,134	1,859
11	Pension	1,904	1,231	2,371	1,703	2,312
12	Remittances	1,060	775	1,402	1,040	1,023
13	Other sources	981	986	1,278	661	1,000

Table 49. Percentage of HHs with non-aquatic sources of income

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
2011	95	99	94	98	89
2018	97	95	98	94	100

Table 50. Percentage of HHs that depend on water drawn from the Mekong River for irrigation, in the last 12 months

	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
2011	23.3	14.4	1.1	12.1	65.7
2014	21.3	5.7	5.3	3.2	84.7
2018	21.3	1.5	1.6	2.7	47.4

Table 51. HHs engaged in fish consumption (%)

Activities	Frequency and sources	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Selling fish	More than 3 times a week	4.6	9.9	2.6	3.4	2.6
	2–3 times a week	3.2	6.1	2.3	2.7	1.6
	once a week	1.7	1.0	3.3	2.4	0
	2– 3 times a month	4.4	2.9	5.3	.9	8.6
	Less than twice a month	3.5	3.6	4.7	5.3	0.6
	Never selling fish	41.7	21.4	27.9	31.4	86.1
Buying fish	More than 3 times a week	32.4	48.7	11.0	18.3	51.7
	2–3 times a week	27.8	27.3	22.6	27.9	33.6
	once a week	9.5	4.4	16.4	12.0	5.1
	2–3 times a month	10.3	4.0	19.9	13.9	3.3
	Less than twice a month	10	6.1	17.4	14.6	1.9
	Never buying fish	9.9	9.4	12.4	13.3	4.3
Consumption of fish	More than 3 times a week	50.9	67.0	31.0	44.6	61.0
	2–3 times a week	32.1	29.6	31.4	31.6	35.9
	Once a week	6.5	1.7	13.1	9.1	2.1
	2–3 times a month	7.0	1.1	16.6	9.7	0.7
	Less than twice a month	2.8	0.6	6.0	4.6	0.1
	Never consume fish	0.5	0	1.6	0.3	0

Sources of fish for consumption						
	Own fresh catch	26.2	26.0	33	31.3	14.6
	Own aquacultural produce	2.1	0.7	3.1	1.6	3.1
	Bought	69.4	72.7	59.1	64.7	81.1
	Own preserve	0.2	0	0.4	0.1	0.1
	Obtain from neighbour or relative	1.3	0.6	2.1	1.9	0.7

Table 52. Selling and buying OAAs/Ps (%)

Activities	Frequency and sources	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
Selling OAAs/Ps	More than 3 times a week	1.7	1.1	1.7	0.9	3.0
	2–3 times a week	1.3	1.0	2.0	1.3	0.9
	once a week	0.9	0.4	1.4	1.3	0.3
	2–3 times a month	1.6	1.1	2.7	1.7	0.7
	Less than twice a month	2.0	0.9	3.4	3.0	0.9
	Never selling OAAs/Ps	47.5	24.1	31.7	40.6	93.7
	Don't know	0.3	0.0	0.0	0.4	0.6
Buying OAAs/Ps	More than 3 times a week	14.2	2.9	5.3	3.9	44.7
	2–3 times a week	27.8	42.3	15.0	11.6	42.3
	Once a week	10.5	11.3	12.9	10.3	7.6
	2–3 times a month	7.7	0.0	16.6	11.4	2.7
	Less than twice a month	14.1	0.0	17.7	36.3	2.4
	Never	25.3	43.6	31.4	26.3	0.0
	Don't know	0.3	0.0	0.7	0.1	0.3

Sources of OAAs/Ps						
	Own fresh catch	27.5	23.4	32.7	43.3	10.4
	Own aquaculture produces	1.6	0.4	2.4	.4	3.1
	Bought	65.6	74.3	55.7	48.7	83.7
	Own preserve	0.5	0.0	1.6	0.1	0.1
	Obtain from neighbour or relative	1.6	1.0	2.3	3.1	0.1
	Don't know	2.6	0.9	4.0	3.3	2.4

Table 53. Coping strategies to flooding (%)

No.	Coping options	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
1	Started fishing	3.2	2.3	7.3	1.7	1.6
2	Changed to farming from another activity	1.4	0.4	2.4	1.0	1.6
3	Changed to casual work in the village	3.8	6.6	4.3	1.4	2.7
4	Found work outside the village	3.6	8.3	3.7	1.4	0.9
5	Made goods to sell	1.7	1.7	1.1	1.0	2.9
6	Sold productive assets such as land, cattle, boats	3.3	2.1	0.9	0.4	9.7
7	Received help from family, relatives, friends	2.3	1.7	4.3	1.0	2.1
8	Received assistance from the government	6.5	4.0	2.3	19.0	0.6
9	Received assistance from an NGO or other organization	2.6	2.0	0.6	3.6	4.4
10	Borrowed money	3.3	5.1	0.6	1.4	5.9
11	Relied on non-timber forest products	0.2	0.1	0.3	0.0	0.4
12	Other	6.6	6.9	12.4	4.1	2.9

Table 54. Flood warming information sources and their reliability (%)

	Measures	Regional	Cambodia	Lao PDR	Thailand	Viet Nam
1	Radio	25.1	48.3	27.1	25.1	0
2	TV	47.1	66.7	48.7	72.9	0
3	SMS	5.5	11.3	3.6	7.1	0
4	Radio loud speaker in the village	51.8	42.3	35.4	32.6	97.0
5	Local knowledge	52.4	44.4	14.3	56.3	94.7
6	Person-to-person	29.4	35.7	26.0	41.7	14.3
7	Internet	28.1	11.6	9.1	17.0	74.7

Annexe 6. List of indicators 2018

	Indicator	Regional
	A. HHs demographics	
1.	% female	49.5%
2.	% dependence	31.2%
3.	HH size	5
4.	Age of head of HH	53.6
5.	Sex of head of HH	
	Male	84.2%
	Female	15.8%
6.	Marital status of head of HH:	
	- Single	3.0%
	- Married	85.0%
	- Widowed	9.0%
	- Divorced	2.0%
	- Separated	1.0%
7.	Education of head of HH:	
	- No qualification	12.0%
	- Primary school	39.2%
	- Lower secondary school	33.2%
	- Upper secondary school	12.2%
	- Vocational school	1.2%
	- College, university and above	2.3%
8.	Highest education in the HH	

9.	Ethnicities of the head of HH	
	B. Vulnerabilities	
10.	% HH heads that did not complete primary school	
11.	Access to safe water/ treated drinking water by HH	
	1. Dug well	5.7%
	2. Drilled well	8.7%
	3. Spring	0.7%
	4. River	6.4%
	5. Reservoir – hydropower	0.1%
	6. Reservoir – irrigation	0.0%
	7. Piped water	12.8%
	8. Rainwater	13.4%
	9. Bottled water	45.3%
	10. Other, please specify	6.9%
	Treatment water	
	Boiling	45.2%
	A filter or chemicals	14.0%
12.	Access to clean toilet facilities	
	Yes, private clean modern toilet	28.6%
	Yes, private traditional toilet	43.4%
	No, shared toilet with others	2.3%
	Have no toilet at all	8.0%
	Yes, private (Cambodia without separating modern and traditional)	17.7%
13.	Distance to the closest health clinic	4.2
14.	% of HHs with a sick member	41.9%
15.	Have health insurance (average number of members in HHs with health insurance)	3.1
	% HHs with health insurance (>=1 member per HH)	59%
16.	% of HHs with a bank account	41.6%
17.	% of HHs with unpaid debt	46.3%
18.	% of HHs with access to electricity, by sources	
	National grid electricity	92.1%
	Battery or generator or small-scale hydro-electricity	4.2%
	Gas and oil lamps	0.7%
	Others	3.0%
19.	Access to information: radio or TV	1.2
	Access to information: % HHs with >= 1 radio or TV	88%
20.	Access to information: a landline or mobile phone (average number per HH)	2.6

	Access to information: with >=1 fixed or mobile phone	95%
21.	Received government support for natural disasters and climate change	13.8%
22.	Poor HH (as designated by the local authority)	25.6%
23.	Received government support for poor HHs	18.4%
24.	Percentage of HHs that had enough food to eat in the last 12 months	93.9%
25.	No. of meals per week on average per day	
	Two meals per day	15.3%
	Three meals per day	84.6%
C. Dependence on Fish and OAAs		
26.	% of adults whose most important occupation is fishing	9.5%
27.	% of HHs whose most important livelihood is fishing	2.7%
28.	% of HHs whose 2nd most important livelihood is fishing	4.2%
29.	% of HH income per capita from fish sales (last month)	9%
	% of HH income per capita from fish sales (last 12 months)	12%
30.	% of HHs with income from fish sales	11%
31.	Mean monthly income per capita from fish sales	
	Sale of own fish catch	85.9
	Sale of other fish catch	295.6
	Sale of fish from aquaculture	276.5
32.	% of HHs with members who fished in the last 12 months	
33.	% of HHs that used mainstream/Tonle Sap Lake in the last 12 months for fishing	71.0%
34.	% meals with fish in a week?	
	More than 3 times a week	50.9%
	2–3 times a week	32.1%
	Once a week	6.5%
	2–3 times a month	7.0%
	Less than twice a month	2.8%
	Never	0.5%
	Don't know	0.0%
35.	% of HHs with income from OAAs	2%
36.	Mean HH monthly income per capita from OAAs	45.9
37.	% of HHs that collected OAAs in the last 12 months	36%
38.	% of HHs that collected OAAs using mainstream/Tonle Sap Lake in the last 12 months	70%
39.	% of HH income per capita from OAA	

	D. Dependence on irrigation and riverbank cultivation	
40.	Mean area of land cultivated by HH in the last 12 months (m2)	15424
41.	% of HHs that depended on water drawn from the Mekong for irrigation in the last 12 months	13.3%
42.	Mean monthly HH income per capita from rice sales	372.2
43.	% of HH income from irrigated crops including rice	78%
	a. sale of rice	$352.6
	b. sale of other crop	$245.5
44.	% of HHs with riverbank cultivation	12.1%
45.	Mean size of riverbank cultivation	11,692.9
	E. Resilience	
46.	Area of cultivated land owned by the HHs	16,162.8
47.	% of HHs with non-aquatic sources of income	97%
48.	% of HHs with wage income	53%
49.	% of HHs with non-farm business income (during the last month)	20%
	% of HHs with non-farm business income (during the last 12 months)	22%
50.	% of HHs that received remittances (during the last month)	13%
50.	% of HHs that received remittances (during the last 12 months)	14%
51.	% of income from remittances	
52.	Mean monthly income from non-aquatic sources	
53.	% of HHs engaged in water-related livelihoods	
	1. Fishing	30.0%
	2. Collecting OAAs/Ps	21.7%
	3. Aquaculture	11.7%
	4. Irrigated farming	34.3%
	5. No irrigated farming	38.0%
	6. Riverbank cultivation	3.6%
	7. Other, please specify	0.5%
54.	% saying they have alternative livelihood options	
	First option	
	1.Shift to fishing	0.1%
	2. Shift to livestock	0.8%
	3. Shift to farming	1.5%
	4. Shift to aquaculture	0.0%
	5. Shift to local employment	1.1%
	6. Migrate	0.3%
	7. Start a business	0.5%
	8. Other	1.0%

	Second option	
	1. Shift to farming	0.6%
	2. Shift to aquaculture	0.0%
	3. Shift to local employment	0.5%
	4. Migrate	0.3%
	5. Start a business	0.2%
	6. Depend on help from others	0.1%
	Third option	
	1. Shift to local employment	0.1%
	2. Borrow money	0.0%
	3. Start a business	0.1%
	4. Other	0.3%
55.	Number of livestock units per capita	
	Cattle/buffalo	2
	Pig/goat	1.5
	Poultry	16
	F. Climate change-related social vulnerabilities	
56.	Proportion of loss of cultivation due to flood, drought, and salinity intrusion	
	Flood	
	(a) Paddy field	61.6%
	(b) Riverbank and island cultivation	63.0%
	Drought and salinity intrusion	
	(a) Paddy field	53.0%
	(b) Riverbank and island cultivation	22.2%
57.	Value of cultivation lost due to floods, droughts, and salinity intrusion	
	Flood	
	(a) Paddy field (rice loss)	$594
	(b) Riverbank loss	$481
	c) Aquaculture loss	$327
	Drought	
	(a) Paddy field (rice loss)	$323
	(b) Riverbank loss	$427
	c) Aquaculture loss	$822
	Salinity intrusion	
	a. Agricultural production	$79
58.	Proportion of loss of livestock due to floods and droughts	
	Flood	
	a. Number of cows lost	1,250,003

b. Number pigs lost	7
c. Number of poultry lost	28
Drought	
a. Number of cows lost	11
b. Number of pigs lost	6
c. Number of poultry lost	32

59.   Value of livestock lost due to floods and droughts

Flood	
a. Cow	$618
b. Pig	$97
c. Poultry	$80
Drought	
a. Cow	$730
b. Pig	$804
c. Poultry	$79

60.   Average values of property losses due to floods, droughts, and/or other forms of climate variability

Flood	$832
Drought	$1,067

61.   Most frequently used coping strategies for floods, droughts, and other forms of climate variability

Flooding	
Started fishing	3.2%
Changed to farming from another activity	1.4%
Took on casual work in the village	3.8%
Found work outside the village	3.6%
Made goods to sell	1.7%
Sold productive assets such as land, cattle, boats	3.3%
Received help from family, relatives, friends	2.3%
Received assistance from the government	6.5%
Received assistance from an NGO or other organization	2.6%
Borrowed money	3.3%
Relied on non-timber forest products	0.2%
Other	6.6%
Drought	
Started fishing	0.8%
Changed to farming from another activity	2.6%
Took on casual work in the village	1.7%
Found work outside the village	3.9%

	Made goods to sell	0.5%
	Sold productive assets such as land, cattle, boats	0.9%
	Received help from family, relatives, friends	1.3%
	Received assistance from the government	5.2%
	Received assistance from an NGO or other organization	1.2%
	Borrowed money	0.7%
	Relied on non-timber forest products	1.7%
	Other	8.0%
G. Gender-specific indicators		
62.	Labour force participation rates for 15+, by sex	56.50%
63.	% of female heads of HHs	15.8%
64.	Gap in HH income between female- and male-headed HHs	
65.	Primary completion rate, by sex	
66.	Graduation at upper secondary, by sex	
67.	Education attainment of population aged 25 and over, by sex (female)	
	Education attainment of population aged 25 and over, by sex (male)	
68.	% of adults who have wages from the most important and second most important occupation, by sex	
69.	% of adults who main occupation is water-related (fishing, collecting OAAs, aquaculture, fish processing, navigation, sand mining), by sex	