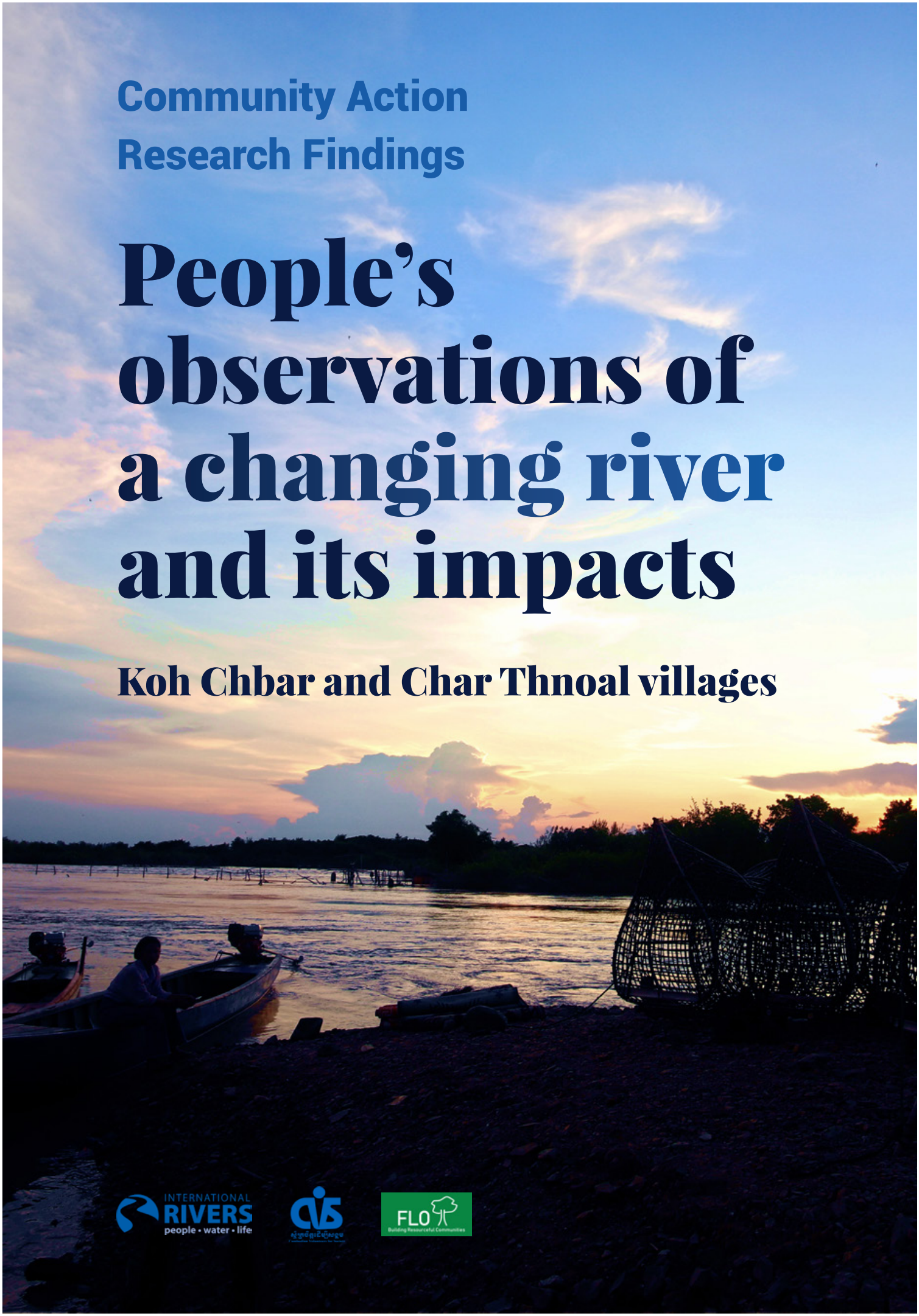
Community Action Research Findings

People's observations of a changing river and its impacts

Koh Chbar and Char Thnoal villages



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FLO Building Resourceful Communities

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Front and back covers: Mekong River at sunset, Kampi, Kratie province, 2022. Photo: Chim Chamroeun

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A fisherman checking through his fishing net,
Mekong River, Koh Chbar, 2022.
Photo: Chim Chamroeun

1. Introduction

Over the past decade, Koh Chbar and Char Thnoal villagers living along the Mekong in Sambor district, Kratie province, Cambodia, have observed significant changes to the river ecology and resource systems on which their livelihoods depend. In particular, irregular and unpredictable fluctuation in water levels, declining fish stocks and species, and river bank erosion are indications that the river is unhealthy. In response to these changes, villagers decided to document these environmental changes and impacts on their lives and livelihoods from the perspective of their lived experiences.

A Community Action Research (CAR) was undertaken by community members with the support of consultants from International Rivers and Cambodia Volunteers for Society (CVS) to collect and analyse data, building on local knowledge and lived experiences. Their documented findings are summarised in this report, to be shared with community members as well as other relevant stakeholders including NGOs and governments. It is hoped that CAR findings can be used to help inform community members and other stakeholders to better manage and conserve the river and its natural resources in ways that recognises, values and builds on local people's lived experiences. Furthermore, CAR is part of a process that can also help inform community-led development plans to address key challenges, including some of those identified in this report, and improve environmental and socio-economic outcomes for the people of Koh Chbar and Char Thnoal.

This report outlines the key process and findings of the CAR undertaken in Koh Chbar and Char Thnoal villages. The first section provides a brief overview of the two villages and communities. The second section outlines the CAR process. The third section summarises some of the key findings related to the changes in the river and its impacts on people's lives and livelihoods. The report concludes with some next steps.

Source: OpenStreetMap, 2023.
The map has been simplified
(eg. boundaries, roads and other
small elements have been left out).

2. Location of study: Koh Chbar and Char Thnoal villages, Sambor district, Kratie province

Community Action Research (CAR) was conducted in two villages along the Mekong in Sambor district, Kratie province. Koh Chbar village is 14km upstream of Sambor town and Char Thnoal is located 6km downstream of Sambor town (see map).

Koh Chbar village

As of early 2023, there were 237 households with a total population of 1,076 people (691 women). Six percent of the village population are Indigenous Punong and the rest are ethnic Khmer.

Historically, the majority of people in the village were fishers. They relied on the abundant natural resources from forests and the Mekong River. The rise and fall of the Mekong followed the seasons and fish were plentiful. Riverbanks were rich with fertile soil, which allowed people to grow a variety of vegetables and crops along the riverbanks. The forests also provided a range of non-timber forest products such as resin typically from Dambang trees (ដើមដំបង), honey, rattan etc. Trees in the forest also provided timber to make boats, houses and also a source of income. People practised rotational planting (ចំការវិលជុំ)

Mekong River, Koh Chbar village, 2022. Photo: Chim Chamroeun

People's water storage pumped from the Mekong River, Koh Chbar village, 2022. Photo: Chim Chamroeun

for rice and other crops, and also raised livestock such as pigs, chicken, cows and buffalos.

However, over the past decade the river has been changing – people have observed irregular fluctuations, declines in fish catch, and erosion of riverbanks. With these changes, some villagers are seeking other means to support their livelihoods and earn income, including waged labour, sometimes migrating to other provinces and countries.

Char Thnoal village

Char Thnoal village is downstream from Sambor town. As of early 2023, there are 206 households with a total population of 791 people (476 women). About two percent of the village population are Indigenous Punong and the rest are ethnic Khmer. Traditionally, the main sources of livelihoods was farming, livestock raising, fishing and collection of non-timber forest products such as resin and wild vegetables, such as summer tuplip (ផ្កាចាហួយ), trout rising (ត្រួយរាំង), Trouy Kondou (ត្រួយកណ្តោ), leaves tops (ស្លឹកព្រិច), Slek Chares (ស្លឹកច្រែស), Slek Kondoub (ស្លឹកកណ្ដូប) and vegetable sticks (ចុងដំបង), etc. The forest surrounding the village also used to have lots of large trees, which provided timber for building houses.

The natural rise and fall of the river followed the seasons. During the dry season sand islands emerged and parts of the river were shallow enough for people to cross the river by foot. Rocks in the river had algae, providing food for the many fish species that were found in the river. People used a variety of fishing gear such as fish nets (ដាក់មិង), fishing rods (សន្ទូច), platting (ដាក់ចាន), plashing fish (បាចត្រី), and some collected snails (រាវខ្មៅ).

Preparing food for livestock, Char Thnoal village, 2022.
Photo: Chim Chamroeun

Buffaloes are an important source of household income,
Char Thnoal village, 2022. Photo: Chim Chamroeun

Along the riverbanks, there were many trees which were helpful to prevent the riverbank from eroding. These trees also acted as shelters for fish as well as fish spawning areas. The fertile soil made it easy to grow vegetables. People used the river to water their riverbank gardens and fields, raise livestock, and other household uses such as cooking, bathing and washing clothes.

Over the past decade, the loss of forests, which has reduced access to non-timber forest products, declines in fish, and loss of riverbank gardens, has meant that people have needed to adapt and find other means of livelihood and income generation. Many have migrated outside to look for job and income opportunities.

Mekong River, Char Thnoal village 2022.
Photo: Chim Chamroeun

3. CAR objectives, process and participants

The main purpose of the CAR in Koh Chbar and Char Thnoal villages was to document community members' observations and experiences of changes in the Mekong and how these have impacted on people's lives and livelihoods. Through the process, CAR not only sought to build the knowledge and understanding of changes in the river and its impacts, but also build the confidence and skills of community researchers to document, analyse and articulate what the changes mean for their communities. CAR is one step in a process to identify key issues and challenges facing a community, which in turn can help inform and build community-led measures to address those challenges.

> "I got a better understanding of community action research. Data collection enabled us to have clear understanding about our river, its changes, and its impacts.

> "This study is very important because it helped me understand about our river and encouraged me to work together to preserve our water. For example, at least we can help clean it up and not litter our river to help maintain its quality.

CAR research team of Koh Chbar village, 2023.
Photo: Hem Vanarath

> Our river is like our blood. We depend on it directly and indirectly. It helps our family and community. After learning about development projects and their impacts, [CAR] encouraged me to participate in solving our community's issues because it is an essential thing that we should do together because it will affect us all.

> Being involved in this community action research has really provided me with a clear understanding of our community's situation [and] benefits of our river and impacts caused by the river's changes. It helped me have a clear understanding of our past and current situation.

CAR research team conducting surevys, Char Thnoal village, 2022. Photo: Bun Khemma

CAR research team of Char Thnoal village, 2023. Photo: Hem Vanarath

3.1 CAR process

The CAR process to date in Koh Chbar and Char Thanoal can be broadly divided into four steps.

1. Building awareness of and interest in community action research (CAR). This included sharing information about CAR, the processes involved and its potential benefits. Importantly, other communities who have been involved in community action research shared their experiences of how they conducted the research and used the findings to increase awareness and inform community activities, including community-led development plans. Hearing and learning directly from other community members helped generate interest in and support to undertaking community research in the two villages.

CAR meeting, Koh Chbar, 2020. Photo: Hem Vanarath

CAR researchers from other communities sharing their experience and benefits of CAR for community development and natural resource conservation, Koh Chbar village, 2022. Photo: Hem Vanarath

2. Identifying and building the capacity of CAR team members. Following the information sharing workshops, an initial group of ten people from the two villages volunteered to join the community action research team, who received trainings and support on CAR methods and tools throughout the process. Over time, more researchers joined the team, who were suggested by community members based on some key criteria and characteristics such as leadership, understanding of issues facing the community and ability to read and write. Twenty-nine people formed the CAR teams, comprising 16 people from Koh Chbar and 13 people from Char Thnoal (see Annex 1 for list of CAR team members).

CAR members were identified and provided capacity building, 2021-2022. Photo: Hem Vanarath

CAR members undertaking community problem analysis to inform priority issues and problems to be examined during the CAR process. Photo: Hem Vanarath

3. Collaboratively designing and implementing CAR. This included undertaking a community problem analysis through focus group discussions and individual household meetings to identify key issues and problems to document further as part of the CAR process. Meetings were held to design, test and refine the study and questionnaires and identify community members to participate in the study to ensure different groups and voices were included (see 3.2 CAR survey participants).

Technical team facilitated and assisted CAR members in their research design and collecting data, 2021 until 2022. Photo: Hem Vanarath

Other communities who had undertaken CAR shared their experiences of undertaking CAR, 2022. Photo: Hem Vanarath

Data analysis training for CAR team, 2022. Photo: Bun Khemma

CAR research findings report dissemination and the consultation on the findings, Koh Chbar village, 2023. Photo: Hem Vanarath

4. Collaboratively analysing data and disseminating the findings: Once the data and information was collected and consolidated, a number of meetings were held between the CAR team and the consultants to analyse the data and present the preliminary findings to wider community members, whose feedback has informed this version of the report. Another sharing and feedback session with villagers, local authorities and CAR team members is planned for March 2023 (see Table 1, timeline of key events).

CAR research findings report dissemination and focus group consultation on the findings, Char Thnoal village, 2023. Photo: Bun Khemma

Table 1: Timeline of key events in CAR process in Koh Chbar and Char Thnoal

Date	Activities
2-4 Mar 2020; 13-17 Aug 2020	Initial information sharing and consultation workshops to increase awareness and assess interest in community action research (CAR)
3-4 Nov 2020	Workshop, where other communities who had undertaken CAR shared their experiences of undertaking CAR, including challenges and benefits. Identified initial group of community volunteers to be part of the CAR team.
April-Nov 2021	Initial group of CAR team members conducted small group discussions, one-to-one meetings to inform and consult community members about CAR, including people's interest to contribute to CAR process.
20-21 Dec 2021	Conducted training for CAR team members on CAR, including its importance, different tools and methods used in CAR, with a particular focus on community problem analysis, which can help inform priority issues and problems to be examined during the CAR process. Conducted a community exposure visit to increase awareness on the links between community ecosystem conservation and community development.
Jan-March 2022	Community Focus Group Discussions and individual household meetings to undertake community problem analysis.
2-5 April 2022	Focus groups discussions with communities and CAR team members to discuss issues and findings from the community problem analysis in order to identify and prioritise the topic to be examined as part of the CAR.
18-19 June 2022	Focus group discussions with CAR and community members on changes in the river.
2-4 Aug 2022	Community exposure visit and training on CAR. The exposure visit was to another community, who had undertaken CAR, providing an opportunity to hear directly from other community members about the CAR process, its benefits and challenges. The trip also included a training on data collection and questionnaire design, as well as on Free Prior and Informed Consent (FPIC). Collaborative design of the questionnaire by CAR team members with support from technical consultant and representatives from other communities who have undertaken CAR.
Sept 2022	CAR team members conducted one on one interviews and tested the draft questionnaire among the team members and relatives, after which the questionnaires were adjusted and finalised.
7-8 Oct 2022	Community exposure visit to Stung Treng province to learn about how people's access to the river and natural resources have changed as a result of a large-scale development project.
Oct-Dec 2022	Data collection, including questionnaire, individual interviews. Trainings for CAR team members on data analysis and consolidation. Developed first draft of report with preliminary findings, which was discussed with CAR team and some community members.
Jan 2023	CAR team members conducted extra data collection to address some gaps identified in feedback, after which 1st draft of the CAR report drafted.
18-20 Feb 2023	Meetings to gather feedback on the 2nd draft CAR report findings from community members and CAR team.
March 2023	3rd draft CAR draft report dissemination and final feedback from communities' members, local authorities and CAR team members.

3.2 CAR survey participants

The CAR team wanted to ensure to that different community voices were included. Firstly, CAR team mapped out different groups of people, which took into account e.g. ethnicity, gender, social status, disability, religion, primary livelihood and jobs (i.e., fisher, farmer, government employee, etc.), family dynamics (i.e., number of children in the household), and so on.

A total of 103 participants/households including men, women, Indigenous peoples, youth and elders, and people with disabilities participated in the survey (see Table 2).

Survey participants represent approximately 23% of total households in Koh Chbar (55 out of 237 households in the village) and Char Thnoal (48 out of 206 households in the village).

In Koh Chbar village, there were 55 respondents (28 men and 27 women). 49% of respondents identified farming as their primary job, followed by fishing (20%) and livestock raising (5.6%). In Char Thnaol village, there were 48 informants (20 men and 28 women). 37.5% of respondents identified farming as their primary livelihoods, followed by housewives (27.1%), and fishing (18.8%). See Annex 2 for breakdown of primary jobs of respondents in Koh Chbar and Char Thnoal villages.

Table 2: Participants in the CAR survey

Koh Chbar Village	Number of key informants	% of total respondents	Char Thnoal Village	Number of key informants	% of total respondents
Total participants	**55**		**Total participants**	**48**	
Men	28	51%	Men	20	42%
Women	27	49%	Women	28	58%
Youth (15-30 years old)	9	16.5%	Youth (15-30 years old)	7	14.5%
Adults (31-59 years old)	37	67%	Adults (31-59 years old)	34	71%
Elders (60-81 years old)	9	16.5%	Elders (60-81 years old)	7	14.5%
People with disabilities	2	4%	People with disabilities	2	4%
Indigenous people	3	5%	Indigenous people	1	2%

4. Findings: Changes in the river and impacts on people's livelihoods

> The changes of the river make it difficult to catch fish, raise animals, grow vegetables and collect water for households use.
>
> 24-year-old female fisher, Char Thnoal village.

All the villagers in Koh Chbar and Cha Thnoal that participated in the CAR through surveys, interviews and focus group discussions reported that the Mekong River is different to what it used to be. Over the past decade, they have observed significant changes to the river ecology and resources on which their livelihoods depend. They reported that the flows and levels of the river no longer follow the seasons like it used to. In the past the water used to rise during the wet season and fall during the dry season, but now the rise and fall of the river is irregular and unpredictable, at times rising and falling quite sharply. The irregular changes in river levels have also corresponded with significant declines in fish catch, erosion and declining fertility of river banks, an important source of vegetables and crops; and changes in water quality, all of which have had adverse impacts on people's lives and livelihoods.

A boat landed on soil after water receded, Koh Chbar, 2023. Together with fish decline, many fishermen have left their boats behind to look into other jobs. Photo: Mam Pech

4.1 Fish catch decline

> I recall when I moved to live in Koh Chbar in 2007, at that time, I fished and caught enough food for daily living. But since 2012, I could not catch enough fish for cooking. Therefore, I turned to focus on growing vegetables for living instead. Fortunately, an organization offered me a water pump to extract water from our river to grow vegetables.

55-year-old female vegetable farmer, Koh Chbar

> About ten years ago, we had lots of fish. My children would go to catch fish for just a few hours, and they came back with lot of big fish and we could sell them and also keep some to eat. But now, [life] is unlike before. We no longer get that much, not even to eat. Now, we buy food (such as fish from the aquatic fish market) instead. Since fish are scarce, my son had stopped fishing, and has now migrated to work in another province.

62-year-old female farmer, Koh Chbar village

> Some days, the fish I caught was barely enough for my family to eat, let alone to sell.

53-year-old fisher, Koh Chbar

Amount of fish caught ten years ago vs present (2022)

The CAR findings indicate that people in Koh Chbar and Char Thnoal have experienced a dramatic decline in fish catch, compared to ten years ago. People reported that the decline in fish catch has been worse over the past three years. For example, in Koh Chbar, people's responses indicate that the catch per fishing trip ranged from 5kg to 60kg, with 20 respondents indicating they caught more than 20kg per trip. Now, the maximum catch reported by respondents is 3kg per trip. The big difference in fish catch in part is also due to many people having stopped travelling further away over multiple days for

fishing because they fear that income from fish catch would not be enough to cover gasoline costs for the boats.[1] It's a similar story for Char Thnoal: 10 years ago, the catch per trip ranged from 20kg to 100kg but now, the maximum catch in 2022 reported by respondents was 6kg (see Annex 3a: Amount of fish caught per fishing trip: 10 years ago and 2022).

> Before, I could simply use a [rattan] plate to scoop fish, after enticing them to come up to the surface (ប្រលួងត្រី).[2]
>
> 43-year-old female farmer, Koh Chbar village

People also reported that they now use double the amount of fishing gear and nets, which has increased the cost of fishing. However, even though they have doubled the amount of fishing gear and nets, fish catch is less than before.

It should be noted that there are two kinds of fishers: 1) those who travelled away from their homes for a few days for a fishing trip, coming back with lots of fish. One respondent noted that they caught up to 100kg; 2) Those that fish nearby for a half-day or set up fishing nets and gears and go the next morning to collect fish. They would often get up to 10kg of fish.

Size of caught fish

People also reported that size of fish caught has declined, compared to ten years ago. Generally, people divide into two types: big fish species and small fish species.

Big fish species include for example, Great white sheeefish (ត្រីសណ្តាយ), Labeo chrysophekadion (ត្រីក្អែក), Probarbus Jullieni (ត្រីត្រសក់), Trey Ptuk (ត្រីផ្គក់), Bra fish (ត្រីប្រា), Chitala blanci (ត្រីក្តី). Ten years ago, people would catch fish that weighed 10 to 15kg, but now, the maximum weight of these fish species is around 3kg.

Small fish species include for example Henicorhynchus siamensis (ត្រីរៀល), Trey Chrova (ត្រីច្រាំ), Paralaubuca typus (ត្រីស្លឹកឬស្សី), Cannabis (ត្រីកញ្ឆេះ), Trey Kaet (ត្រីក្តិត), Trey Chro kaeng (ត្រីច្រកែង), Neolissochilus blanci (ត្រីគល់ព្រិច), Trey Kompliegn (ត្រីកំភ្លៀញ). The size of small fish caught has also gotten smaller. Ten years ago, people would catch fish such as Trey Chro kaeng (ត្រីច្រកែង), Neolissochilus blanci (ត្រីគល់ព្រិច)that weighed 0.3Kg-0.5Kg per fish, but today, the fish caught weighs 0.2-0.3Kg.

People from Koh Chbar noted that in the past they would never eat small fish. But now, even small fish are hard to come by. They now tend to buy fish (ត្រីចិញ្ចឹម) for eating.

1 Some Koh Chbar people travel away from home for one or two nights, using three to four litres of gasoline for their boats; while Char Thnoal fishers often go from 3pm to 5am, using two to three litres of gasoline.

2 Enticing fish (ប្រលួងត្រី) to come up to the surface is done by throwing some rice bran into the water and then using a rattan plate to scoop the fish.

Fish species

The diversity of fish species caught has also declined, compared to ten years ago. In Koh Chbar village, CAR participants identified 31 species which are commonly caught, while Char Thnoal village, CAR participants identified 14 species (see Annex 3b: Commonly caught fish species in 2022), which is less than ten years ago. CAR participants in Koh Chbar identified 17 fish species that were rarely seen and caught in 2022, while Char Thnoal identified 35 species as being rarely seen and caught in 2022 (see Annex 3c: Rarely seen and seldom caught fish species). Ten years ago, these fish species were more often caught for household consumption, sharing with neighbours and relatives and selling at markets. Participants also reported a number of species that were not seen or caught at all in 2022 (See Annex 3d: Fish species not seen or caught in 2022).

Fish being sold at the market in Kratie town, 2023. Photo: Hem Vanarath

The amount and size of fish caught has reduced, Koh Chbar village, 2022. Photos: Chim Chamroeun

4.2 Riverbank agriculture and livestock

> I stopped growing vegetables along my riverbank because it became too steep, which made it difficult for me to collect water from the river to grow my vegetables. So now I buy water (using running water), and dare not grow food with this because it is expensive to do so.

52-year-old male farmer,
Char Thnoal village

River bank agriculture

The fertile riverbanks that straddle the Mekong in Koh Chbar and Char Thnoal villages have been an important source of food and supplementary income. People in both villages grew a diverse range of fruit and vegetables on the riverbanks including spinach (ផ្ធឺ), morning glory, cucumber, sponge gourd, winged bean, chili, herbs, wax gourd, yard long beans, tomato, eggplant, pumpkin, corn, taro, sesame, yam, watermelon, green beans, linglak (លីងឡាក់), papaya, sweet cucumber, salad greens, and gourd (ឃ្លោក). Majority of people stated that they grew these fruit and vegetables for household consumption and sharing with neighbours and relatives. Some were sold, providing an important source of supplementary income. However, many people have now stopped growing these vegetables due to changes in the river and the riverbanks.

All the respondents who engaged in riverbank agriculture noted that the changes in the river have adversely impacted their ability to grow fruit and vegetables on the riverbanks. As evident in the people's quotes, key impacts include: erosion of river banks, which has made some riverbanks too steep to grow vegetables and access easily, including for water collection; reduced soil fertility of the riverbanks; unpredictable and unseasonal fluctuations in water levels during the dry season, where rising waters have washed away or damaged crops on the riverbanks. The reduction and loss of access to riverbank gardens has resulted in loss of food and income for villagers in the Koh Chbar and Char Thnoal.

Some families have stopped growing vegetables along the riverbanks due to members of their families migrating for waged labour and other income generating opportunities. Often, those migrating were the ones that tended to the riverbank gardens, which require manual labour to set up and maintain. For example, riverbank gardens require fencing to keep livestock out and regular watering. The family members who stay behind have often been older, and who say they do not have energy to maintain the gardens. Instead, they use the remittances from those that have migrated to buy vegetables.

Riverbank gardens, 2021.
Photo: Hem Vanarath

Erosion of riverbanks has reduced the amount of riverbank gardens. Some villagers grow on the mainland but need to find a way to pump the water. 2021. Photo: Hem Vanarath

> This change in the river has made the soil that was once fertile and productive, to become useless because now when we plant, nothing happens. We no longer have yields like before. Now, things that we eat are no longer organic; all use chemicals to cope with this infertile soil.

40-year-old fisherman,
Char Thnoal village

> First, the water flows strongly, the sediment is washed away with the flow. Second, when the water recedes, the soil becomes dry and difficult to cultivate. Third, when we grow things, and almost get to harvest, water rises unexpectedly and kills our crops.

52-year-old vegetable grower,
Char Thnoal village

> When the river water rises, it damaged our crops, yet when the water drops, the water is now too far away from the riverbank, so it is hard to carry the water from the river to pour on our plants.

Indigenous male farmer,
Koh Chbar village

> The river water irregularly fluctuates like this. It is hard to grow anything.

45-year-old male farmer,
Koh Chbar village

> We no longer have riverbanks for growing our vegetables.

60-year-old female vegetable grower,
Char Thnoal village

Riverbank erosion, Koh Chbar, 2023.
Photo: Mam Pech

Livestock raising

All the respondents who raise livestock also reported that the changes in the river, especially irregular fluctuations in water level and decline in water quality has had negative impacts on livestock, who feed on the river water. People have reported some buffaloes' stomachs getting swollen from drinking the water, sometimes leading to death. The irregular fluctuations have also damaged the vegetation, contributing to less food for livestock. And at times, livestock shelters have been flooded by rising waters.

Free range buffaloes resting at a Mekong riverbank, Koh Chbar, 2023. Photo: Mam Pech

> "When the water level rises, my pigs, chickens and ducks could not withstand diseases. When the water level rises, the cattle have to graze on the submerged grass where they are susceptible to infections.
>
> 40-year-old female farmer,
> Char Thnoal village

> "Our animals easily get sick when the water rises and the occurrence of death is high. When they die, we lose income and worsen our livelihoods.
>
> 70-year-old male farmer,
> Koh Chbar village

Raising animals remains an important source of food and income, Char Thnoal village, 2022. Photo: Chim Chamroeun

4.3 Decline in water quality

The Mekong River remains an important source of water for Koh Chabr village, which does not have access to running water. All respondents say they use water from the river daily. 77% of respondents in Char Thnoal, which does have access to running water, say they use the water from the river daily. The majority of people in Char Thnoal still use the Mekong River for farming or raising livestock, given the costs of running water. However, with changes in the river, the quality of water has declined. People reported more algae and foam in the water than before as well as garbage. Some people also reported that the river water now has a slight odour (ក្លិនឆ្អាប-ភក់) and looks a bit dusty, and cloudy which is hard for drinking.

The quotes indicate the fall in water quality has also had health implications, with respondents noting that the river water has contributed to cause itchy skin particularly for people with sensitive skin, stomach aches and diarrhea.

> "I don't use the river water anymore because it is dusty and cloudy (ល្អក់ កករ), so I buy running water for household usage. Using the river water makes my skin itchy.
>
> 40-year-old, housewife,
> Char Thnoal village

> "I use the river water for only washing clothes, not for cooking or drinking. The children even stop playing in the water because they could get diarrhea or an infection. Their health is at risk using the water.
>
> 40-year-old male fisher,
> Char Thnoal village

> "Before we could drink the river water without having to boil it, but now we can't.
>
> 54-year-old female farmer,
> Koh Chbar village

> "Now some people need to buy the water for household usage, and they earn less, so they have to migrate to generate income. Children drop out of school since they follow their parents.
>
> 56-year-old female farmer,
> Char Thnoal village

Mekong River, Koh Chbar, 2022.
Photo Chim Chamroeun

In Char Thnoal village, some people have stopped using the Mekong River for drinking and cooking. Buying water has also added pressure to households, who are already facing increased costs to meet daily needs and/or reduced income due to declines in fisheries and loss of riverbank gardens.

4.4 Other changes and impacts identified during CAR

> Now, my family members do not live together like before. My daughter has to work in another province for income. This is because our resources such as fish and forests are becoming scarce. Before, we made a living with the fish we caught, but now, we struggle because of the lack of fish. We sometimes cannot not catch enough fish just for cooking, let alone for sale.

34-year-old female fisher,
Koh Chbar village

Risk of debt

As a result of declines in natural resources, especially fish, which was a key staple, people have looked for other means of livelihood and income to purchase food for their families. Some families have also applied for loans to micro-finance institutions to run a small business. However, some of the businesses were not able to generate sufficient income, resulting in people migrating to other villages or cities to seek income to pay off their debts. As noted in the following quote, some people have had to sell their land to pay of their debts.

> Before we were not worried about our livelihoods, our daily food, because we can just go put some fishing nets and tools in the river for 30 minutes to an hour or leave it in the river for few hours, and we could collect enough fish for cooking every day. But now, we can't find fish even to cook, so we are worried about what we can eat today or tomorrow. So, some of us borrowed some money from the bank to run businesses, like selling groceries and so on. But some could not generate income from the business, so they migrated for work to pay of their debt. Some even sold their land to pay off their debt.

45-year-old female farmer,
Koh Chbar village

Woman collecting fish catch, Koh Chbar village. She expressed concern that decline in fish catch has adversely impacted her livelihood, 2021. Photo: Hem Vanarath

Char Thnoal ceremony hall, 2022. Photo: Chim Chamroeun

> Our village ceremony hall is now in trouble because the soil along the riverbank is not firm like before. This is causing the foundation to tilt, so we spent money to collectively buy soil for filling in the foundation to ensure the temple stays in place. In the future, we are not sure whether the temple could stay because we saw a big hole under the land around the temple. Before, we had big trees along the edge of the river, and now those trees are gone because the river bank is eroding and the water flow is faster.
>
> 55-year-old female farmer,
> Char Thnoal village

Riverbank erosion is placing Char Thnoal ceremony hall at risk

Char Thnoal ceremony hall[3] is located on the riverbank. With erosion of the riverbank, holes have formed on the land, which is causing the infrastructure to tilt. Char Thnoal villagers have contributed funds to buy soil for filling in the land to try and prevent further tilting, but are not sure if this will be sustained in the long-run.

Women and children are disproportionately impacted by changes in the river

The change in access to sources of food and income such as fish and riverbank gardens as well as reduction in water quality has had disproportionate impacts on women and

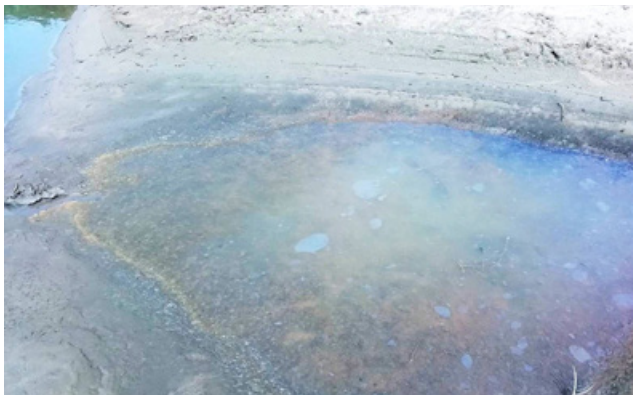
3 Ceremony hall (សាលាសន្សំបុណ្យ) is a multi purpose community hall used for community activities, or performing acts of charitable giving or religious ceremonies or festivals.

children. Women are the primary collectors and users of water from the river for households. Erosion has made riverbanks steeper, making it more difficult for women to collect water. Poor water quality has also impacted the health of women and children, with some people reporting that children tend to get ill/ fever due to the river water. The decline in fisheries and loss of riverbank gardens has also meant that there is less food available to feed the family. Some women have migrated to other provinces to seek work, sometimes with their children, who have dropped out of school to join their mothers.

An increase of new type of algae in their river

People in both Koh Chbar and Char Thnoal reported that there has been an increase in a different type of algae over the past few years. In the past the algae grew on top of the rocks in the river and was quite long. Now, the algae now is short (ខ្លីៗ ដុំៗ), and smells like mud muddy (ក្លិនភក់). According to local people, the fish tend not to eat this different type of algae, which has increased in recent years. It was also noted that some people get itchy skin when they touch this type of algae.

Appearance of new type of algae in Koh Chbar village, 2022. Photo: Hem Vanarath



Appearance of new type of algae in Koh Chbar village, 2023. Photo: Mam Pech

Rock hills in the Mekong River in Koh Chbar village. With higher water levels during the dry season, many rocks and sandy islands remain submerged, 2022. Photo: Hem Vanarath

Loss of sandy islands and rocks

With higher water levels during the dry season, sandy islands and rocks have largely disappeared. People in Char Thnaol village used to walk across the river during the dry season to Prial island, but now it has disappeared. Similarly, many rocky outcrops, which used to emerge during the dry season when water levels fell, are no longer visible. During the dry season, small trees and algae used to grow on these rocks, which provided food and habitat for fish during the wet season. One benefit of higher water levels submerging the rock and rapids during the dry season is that it has made it easier for people in Koh Chbar to travel by boat.

4.5 People's knowledge around the causes of changes in the river

The vast majority of CAR participants noted they knew the causes of changes in the river, including irregular fluctuations, declines in fish, loss of riverbanks and gardens, reduction in water quality. The four most common causes identified include: 1) the development of large-scale hydropower projects upstream; 2) illegal fishing; 3) dumping of garbage and waste into the river; and 4) climate change and natural disasters.

Regarding hydropower projects upstream, people noted how hydropower projects are blocking fish migration and damaged key fish habitats, which has contributed to a decline in fish catch and diversity of species. Some people also mentioned how hydropower projects can withhold water and believe that it has contributed to the unusual and unpredictable fluctuations observed in the Mekong, which has impacted not only fisheries but also erosion and loss of riverbank gardens.

Illegal fishing was also noted as contributing to the decline in fisheries, including use of electric fishing gear. Some people noted that illegal fishing has increased over the years. Some other causes identified include e.g. loss of fish spawning habitats and fish sanctuaries becoming shallower, and at times the water levels being too low for extended periods of time.

People noted that some people in Sambor town throw rubbish into the river, which has made the river become dirtier and more polluted. Furthermore, there is a sugar palm company near Koh Chbar village, which used to dump sugar cane waste into the river. Following complaints by local people, the company has reduced dumping of waste into the river – but it still takes place, which has impacted on water quality.

People also identified climate change and natural disasters as a cause, noting that sometimes there is too much rain and sometimes there is too much drought. For example, intense rainfall has seen the river rise quickly flooding parts of the villages and damaging people's homes, roads, agricultural lands and shelters for livestock.

5. Conclusion and next steps

> Even though our current river like this, we still have some fish and we still use the water for growing things. It has potential for tourism and it is a comfortable place for people and animals to live.
>
> 39-year-old farmer, Char Thnoal village

> Our river is giving life to people, animals, plants and they (we) could not live without water.
>
> 50-year-old civil servant, Char Thnoal village

> It can be used for everyday life and reduce extra costs. It can help irrigate crops and reduce costs to grow crops without having to spend money.
>
> 28-year-old female housewife, Koh Chbar village

> Our river is essential for us. We shall know about how to utilize it and work together to preserve our river.
>
> 58-year-old female farmer, Koh Chbar village

Despite the challenges and hardships that changes in the Mekong River, its ecosystems and aquatic resources and surrounding forests have posed for the villagers of Koh Chbar and Char Thnoal, many highlighted the importance of the Mekong River and how it's an essential resource they cannot live without. As seen in the quotes, people also expressed their wish and commitment to preserve and take good care of the Mekong.

The CAR process also included opportunities for participants to share and discuss the sort of development they want and do not want (see quotes), as well as how they could contribute towards building a better future. A common response on types of development was that they do not projects that make people's lives and livelihoods harder or violates people's rights, but rather want development which can help solve people's concerns and challenges. Some people also pointed to desire for improving local infrastructure and services including for example, schools, bridges and roads.

People expressed a desire to contribute to the development process e.g. through contribution of labour, participation in meetings, financial contribution, monitoring development processes in the community, contributing to research and studies and supporting other villagers. These responses indicate that people want to contribute to, have say over, and benefit from development projects and processes.

Many CAR participants also expressed that they would appreciate it if local authorities would develop plans that are more inclusive. They hope that local authorities will share more information about development projects that may impact their villages and livelihoods and include people's participation and voices in decisions that affect them. Local authorities noted that when there are

plans for development projects, including large-scale infrastructure projects such as hydropower dams, there should be comprehensive studies to assess impacts and avoid adverse impacts on people's lives and livelihoods.

This CAR report will be disseminated and used to facilitate more discussions amongst members of both Koh Chbar and Char Thnoal to identify and priorities key challenges and problems they want to address, which would then help inform a community development plan in the respective villages.

> I would like to suggest that the government and investors not have any hydropower projects in our village because it will affect our lives and natural resources.

35-year-old female farmer,
Koh Chbar village

> I urge the investors not to build hydropower dams because it will affect our livelihoods, land, houses, animals, culture, traditions, and many other resources.

42-year-old male fisher,
Char Thnoal village

> We would like to suggest that when planning for any development, the people must be informed in advance so that the development does not affect the people.

42-year-old small business owner
(grocery seller), Char Thnoal village

> Please respect people's voices.

42-year-old housewife, Char Thnoal village

> I want our government to develop projects that will help improve livelihoods of the people, not worsen our livelihoods.

43-year-old male farmer, Koh Chbar village

> Please do not have any development projects that harm people and damage people's properties.

52-year-old male farmer,
Char Thnoal village

> Please put people before any project.

50-year-old male fisher,
Char Thnoal village

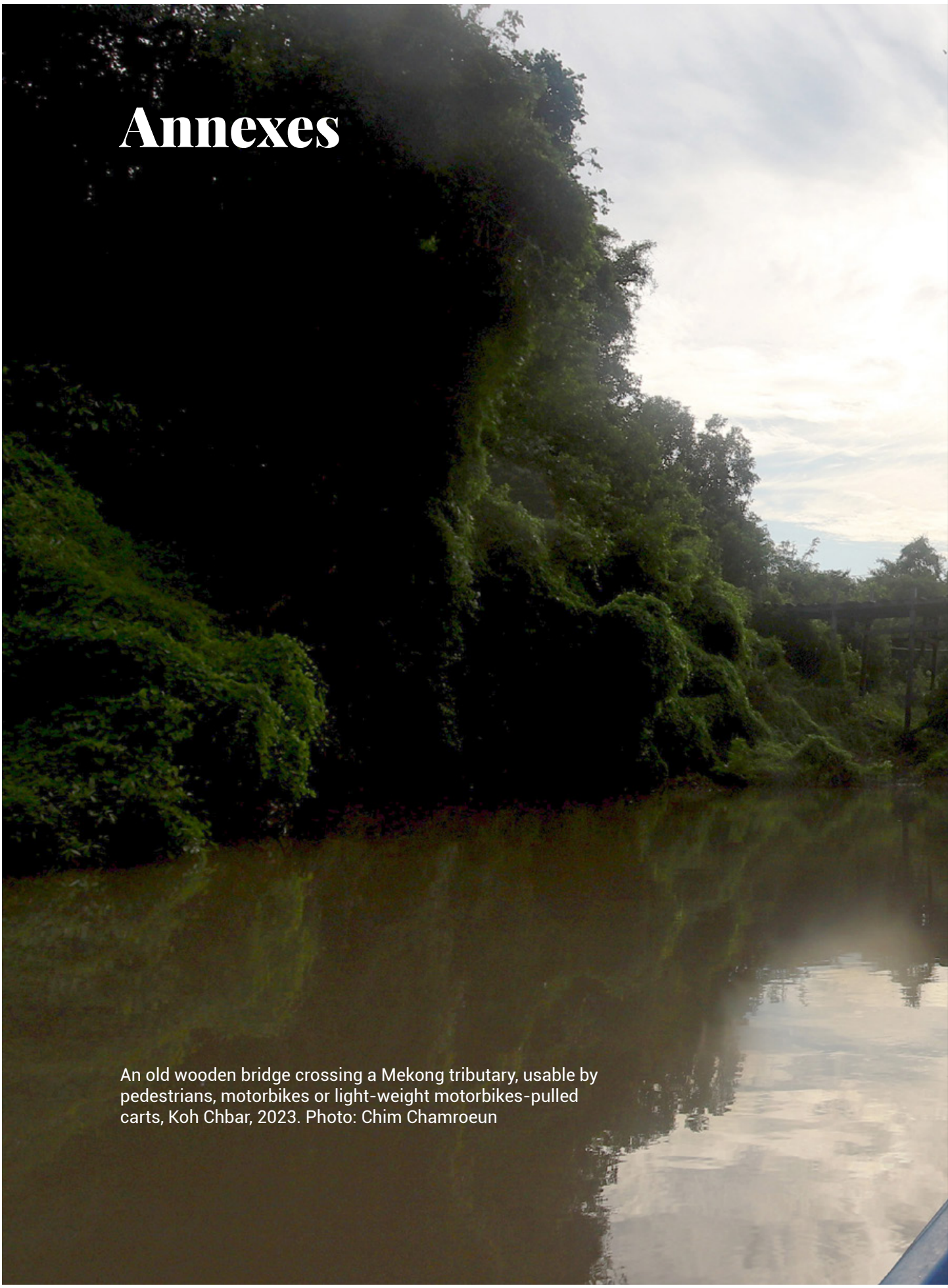
> We would like to request for natural seeds, natural fertilizers, clean water, and sanitation projects to improve our livelihoods.

37-year-old male farmer, Char Thnoal village

> I wish the government can build a bridge and road for us.

51-year-old female farmer,
Koh Chbar village

Annexes



An old wooden bridge crossing a Mekong tributary, usable by pedestrians, motorbikes or light-weight motorbikes-pulled carts, Koh Chbar, 2023. Photo: Chim Chamroeun

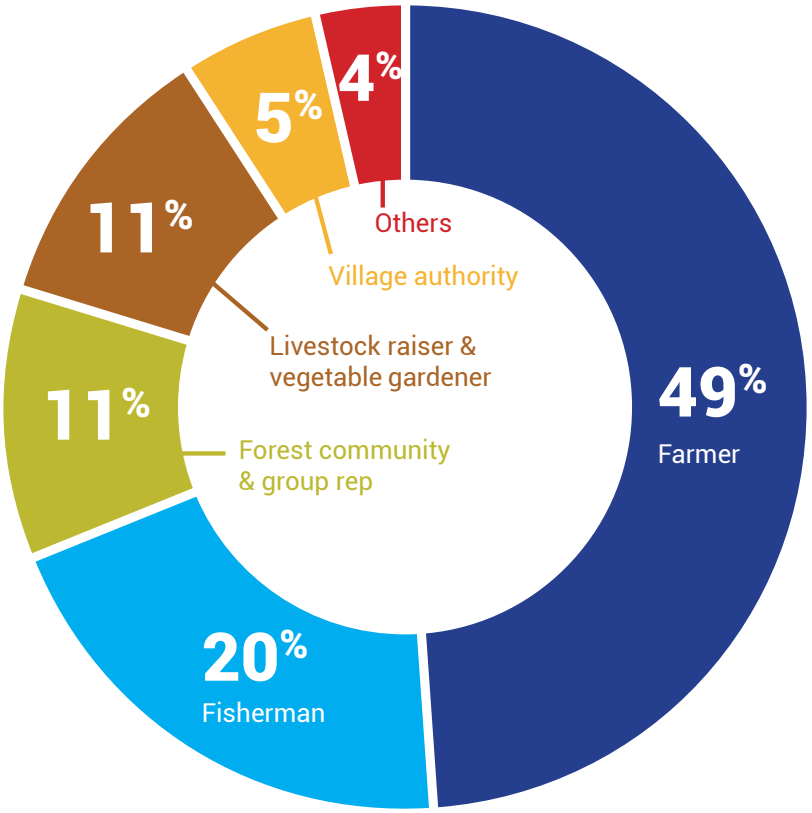

NUMBER ONE

Annex 1: CAR team members in Koh Chbar and Char Thnoal villages

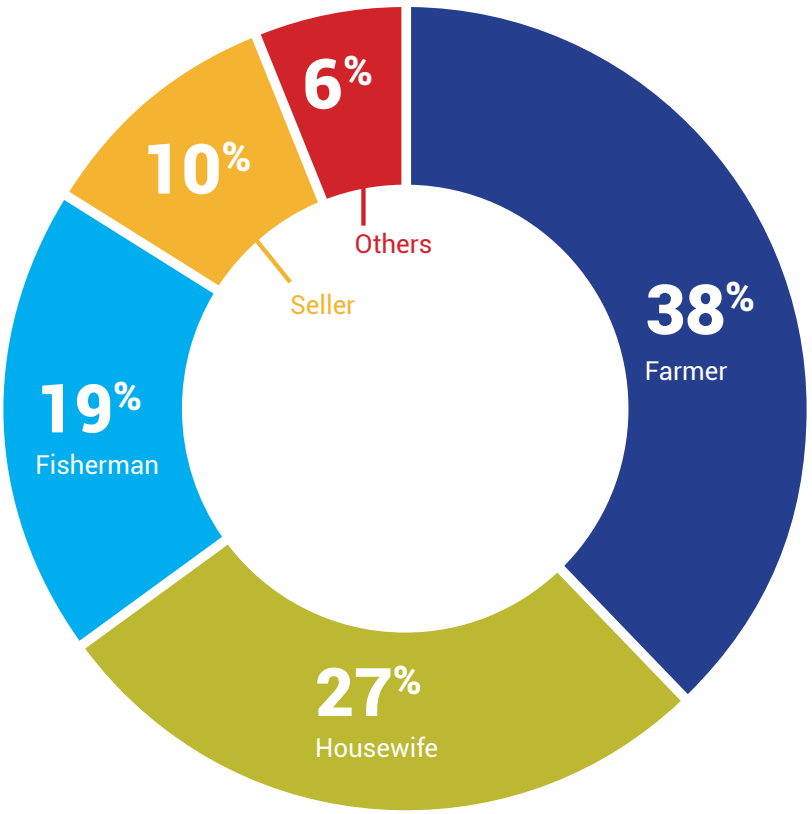
No.	Research team in Koh Chbar village	No.	Research Team in Char Thnoal village
1	Ms. Khon Nita (Youth)	1	Ms. Kai Theany (Youth)
2	Ms. Seng Chanthan	2	Ms. Pao Maley (Youth)
3	Ms. Mam Pech	3	Ms. Mon Phin Thang (Youth)
4	Ms. Hong Loemhin	4	Ms. Seng Sopheakny (Youth)
5	Mr. Chin Sem	5	Ms. Phean Rachny (Youth)
6	Mr. Chhem Tola	6	Ms. Chun Ounhe (Youth)
7	Mr. Seng Polou	7	Mr. Pen Sam Oeurn
8	Mr. Leng Ly	8	Mr. Man Nan
9	Mr. Chai Samo (Youth)	9	Mr. Bun Khema
10	Mr. Som Ty	10	Ms. Tun Sreyty
11	Mr. Toun Chr	11	Ms. Mon Thavry
12	Ms. Som Sreykeith	12	Ms. Roeun Narey
13	Mr. Kang Kinchorn	13	Ms. Seng Sonyta
14	Mr. Non Bunsoeoun		
15	Mr. So Phout		
16	Ms. Van Sokarn		

Annex 2: Primary jobs of survey respondents in Koh Chbar and Char Thnoal villages

Primary jobs of survey respondents in Koh Chbar village (%)



Primary jobs of survey respondents in Koh Chbar village (%)



Annex 3a: Amount of fish caught per fishing trip: 10 years ago and 2022

# ID people	Koh Chbar village (fish caught per trip)		Char Thnaol village (fish caught per trip)	
	Ten years ago	2022	Ten years ago	2022
1	40Kg-50Kg	2Kg-1Kg	30Kg-40Kg	N/A
2	30Kg-50Kg	2Kg	40Kg-50Kg	2Kg-3Kg
3	30Kg-40Kg	1Kg-2Kg	30Kg-60Kg	3Kg-4Kg
4	20Kg-30kg	2Kg	40Kg-60Kg	1Kg-6Kg
5	30Kg-50Kg	1Kg	40Kg-70Kg	4Kg-5Kg
6	5Kg	1Kg	30Kg-50Kg	3Kg-6Kg
7	20Kg-40Kg	3Kg	30Kg-40Kg	4Kg-5Kg
8	50Kg-60Kg	1Kg-2Kg	30Kg-40Kg	2Kg-5Kg
9	5Kg-10Kg	1Kg	20Kg-40Kg	2Kg-5Kg
10	10Kg	2Kg	40Kg-60Kg	2Kg-5Kg
11	30Kg-40Kg	3Kg	40Kg-60Kg	2Kg-4Kg
12	3Kg-4Kg	2Kg	20Kg-30Kg	2Kg-4Kg
13	10Kg-15Kg	2Kg	20Kg-30Kg	2Kg-3Kg
14	10Kg	1Kg-2Kg	30Kg-50Kg	2Kg-6Kg
15	N/A	N/A	50Kg-60Kg	2Kg-5Kg
16	10Kg	2Kg	30Kg-35Kg	2Kg-5Kg
17	10Kg	2Kg	30Kg-50Kg	2Kg-4Kg
18	10Kg	2Kg	40Kg-50Kg	2Kg-3Kg
19	N/A	N/A	50Kg-70Kg	2Kg-5Kg
20	N/A	N/A	50Kg-70Kg	2Kg-4Kg
21	30Kg-50Kg	2Kg	40Kg-50Kg	1Kg-2Kg
22	30Kg-40Kg	2Kg	30Kg-40Kg	1kg
23	30Kg-50Kg	2Kg	40Kg-50kg	1kg-2kg
24	20Kg-40Kg	1Kg	50kg-60kg	1kg
25	30Kg-50Kg	1Kg	50Kg-87Kg	1Kg-2Kg
26	10Kg-30Kg	2Kg	30Kg-50Kg	2Kg-4Kg

# ID people	Koh Chbar village (fish caught per trip)		Char Thnaol village (fish caught per trip)	
27	40Kg-50Kg	1Kg	30Kg-50Kg	1Kg-2Kg
28	30Kg-40Kg	1Kg	50Kg-80Kg	2Kg-5Kg
29	15Kg-30Kg	2Kg	50Kg-70Kg	1Kg-2Kg
30	10Kg-15Kg	2Kg	30Kg-60Kg	2Kg-3Kg
31	20Kg-30Kg	3Kg	20Kg-40Kg	1Kg-2Kg
32	10Kg	2Kg	50Kg-100Kg	1Kg-2Kg
33	5Kg-10Kg	2Kg	40Kg-50Kg	2Kg-3Kg
34	10Kg	2Kg	40Kg-70Kg	1Kg-2Kg
35	10Kg-15Kg	2Kg	50Kg-70Kg	1Kg-2Kg
36	15Kg-20Kg	3Kg	60Kg-90Kg	1Kg-3Kg
37	10Kg-20Kg	2Kg	30Kg-70Kg	1Kg-2Kg
38	15Kg-30Kg	2Kg	40Kg-70Kg	2Kg-1Kg
39	N/A	N/A	60Kg-80Kg	1Kg-2Kg
40	20Kg-30Kg	1Kg	50Kg-60Kg	2Kg-4Kg
41	N/A	N/A	50Kg-80Kg	1Kg-3Kg
42	10Kg-15Kg	2Kg	42Kg-70Kg	2Kg-3Kg
43	N/A	N/A	30Kg-70Kg	2Kg-3Kg
44	5Kg-10Kg	2Kg	40Kg-50Kg	2Kg-1Kg
45	20Kg-40Kg	1Kg-2Kg	40Kg-70Kg	1Kg-2Kg
46	10Kg	1Kg	20Kg-40Kg	2Kg-3Kg
47	10Kg-15Kg	0.5Kg	50Kg-60Kg	1Kg-2Kg
48	10Kg-15Kg	0.5Kg	40Kg-70Kg	1-Kg
49	10Kg-15Kg	0.5Kg		
50	20Kg-40Kg	2Kg		
51	5Kg-10Kg	0.5Kg		
52	5Kg-10Kg	1Kg-2Kg		
53	10Kg-15Kg	1Kg-2Kg		
54	20Kg-30Kg	1Kg-2Kg		
55	20Kg-25Kg	1Kg		

Annex 3b: Commonly caught fish species in Koh Chbar and Char Thnoal villages in 2022

No.	Fish species	Commonly caught in Koh Chbar village	Commonly caught in Char Thnoal village
1	Opsarius koratensis (ត្រីច្រវ៉ា/ត្រីចង្វា)	✓	
2	Henicorhynchus siamensis (ត្រីរៀល)	✓	✓
3	Trey Kyal (ត្រីខ្យល់)	✓	✓
4	Pangasius macronema (ត្រីឈ្លាត)	✓	
5	Labiobarbus siamensis (ត្រីអាចម៍កុក)	✓	✓
6	Cycloscheilichthys lagleri (ត្រីស្រកាក្តាម)	✓	
7	Trey Tronung (ត្រីទ្រនុងខ្នង)	✓	
8	Parambassis apogonoides (ត្រីកញ្ជាញ់ច្រាស)	✓	
9	Hemibagrus wyckii (ត្រីឆ្លាំង)	✓	
10	Puntioplites proctozysron (ត្រីច្រកែង)	✓	✓
11	Osteochilus schlegeli (ត្រីលលកសរ)	✓	✓
12	Labiobarbus siamensis (ត្រីអាចម៍កុក ឬ អាចម៍ស្វា ឬ ប៉ាភៀន)	✓	✓
13	Channa striata (Striped snakehead) (ត្រីផ្គក់)	✓	
14	Paralaubuca typus (ត្រីស្លឹកឬស្សី)	✓	
15	Morulius chrysophekadion (ត្រីក្អែក)	✓	✓
16	Mystus albolineatus (ត្រីកញ្ឆេះ)	✓	✓
17	Neolissochilus blanci (ត្រីគល់ព្រេច)	✓	✓
18	Trey Agn Deng (ត្រីអណ្តែង)	✓	✓
19	Anabas testudineus (ត្រីក្រាញ់)	✓	✓
20	Macrognathus taeniagaster (ត្រីឆ្លួញ)	✓	
21	Macrognathus semiocellatus (Eyespot spiny eel) (ត្រីខ្ជឹង)	✓	

No.	Fish species	Commonly caught in Koh Chbar village	Commonly caught in Char Thnoal village
22	Oxyeleotris marmorata (ត្រីដំរី)	✓	
23	Datniodes undecimradiatus (ត្រីខ្លា)	✓	
24	Cosmochilus harmandi (ត្រីឆ្កោកក្តារ)	✓	
25	Hypsibarbus malcolmi (ត្រីឆ្ពិន)	✓	✓
26	Tenualosa toil (Toli shad) (ត្រីប៉ាលូង)	✓	
27	Helicophagus waandersi (ត្រីប្រាកណ្តុរ)	✓	✓
28	Hemibagrus wyckioides-red (ខ្យាក្រហម)	✓	
29	Cosmochilus harmandi (ត្រីឆ្កោកក្តារ)	✓	
30	Hemibagrus wyckioides (ត្រីខ្យា)	✓	
31	Hampala dispar (ត្រីខ្មាន់)	✓	
32	Micronema apogon (ត្រីកែស)		✓
	Total	**31**	**14**

Annex 3c: Fish species that are rarely seen and caught in Koh Chbar and Char Thnoal villages in 2022

No.	Fish species	Fish species that are rarely seen in Koh Chbar village	Fish species that are rarely seen in Char Thnaol village
1	Oxyeleotris marmorata (ត្រីដំរី)		✓
2	Great white sheefish (ត្រីសណ្តាយ)	✓	✓
3	Chitala blanci(ត្រីក្តី)	✓	✓
4	Chitala rrnata (ត្រីក្រាយ)	✓	✓
5	Pangasius (ត្រីពោ)	✓	✓
6	Osphronemus exodon (ត្រីរមាស)	✓	✓
7	Cosmochilus harmandi (ត្រីឆ្កោកក្តារ)		✓
8	Wallago leerii (ត្រីស្នក់)	✓	✓
9	Pangasius djambal (ត្រីជ្រោ)	✓	✓
10	Tenualosa toil (Toli shad) (ត្រីប៉ាលូង)		✓
11	Micronema apogon (ត្រីកែស)	✓	
12	Hemibagrus wyckioides (ខ្យាក្រហម)		✓
13	Belodontichthys truncatus (ត្រីក្លាំងហាយ)	✓	✓
14	Probarbus Jullieni (ត្រីត្រសក់)	✓	✓
15	Cyclocheilichthys enoplos (ត្រីឆ្កោកមូល)	✓	✓
16	Hemibagrus wyckii (ត្រីឆ្លាំង)		✓
17	Osteochilus melanopleurus (ត្រីគ្រំ)	✓ (tiny ones)	✓ (tiny ones)
18	Hemibagrus wyckioides (ត្រីខ្យា)		✓
19	Hampala dispar (ត្រីខ្នាន់)		✓
20	Kraya fish (ត្រីក្រយ៉ា)	✓	✓
21	Bagarius yarrelli (ត្រីក្របី/កន្ធន់ដី)	✓	✓
22	Channa striata (Striped snakehead) (ត្រីផ្គក់)		✓

No.	Fish species	Fish species that are rarely seen in Koh Chbar village	Fish species that are rarely seen in Char Thnaol village
23	Tenualosa toil (Toli shad) (ត្រីប៉ាលូង)		✓
24	Cyclocheilichthys enoplos (ត្រីឆ្កោក)	✓	✓
25	Hemibagrus filamentus (ត្រីទ្រនេល)	✓	✓
26	Channa micropeltes (ត្រីដៀប)	✓	
27	Rasbora tornieri (Southeast Asian yellowtail rasbora) (ត្រីច្រាំឬ ចង្វា)		✓
28	Parambassis apogonoides (ត្រីកញ្ជាញ់ច្រាស)		✓
29	Pangasius macronema (ត្រីឈ្លាត)		✓
30	Cycloscheilichthys lagleri (ត្រីស្រកាក្តាម)		✓
31	Trey Tronung (ត្រីទ្រនុងខ្នង)		✓
32	Parambassis apogonoides (ត្រីកញ្ជាញ់ច្រាស)		✓
33	Paralaubuca typus (ត្រីស្លឹកឬស្សី)		✓
34	Macrognathus taeniagaster (ត្រីឆ្លួញ)		✓
35	Macrognathus semiocellatus (Eyespot spiny eel) (ត្រីខ្ជឹង)		✓
36	Mekonggina erythrospila (ត្រីប៉ាស៊ីអ៊ី)		✓
37	Rock trout (ត្រីក្រយ៉ាខ្មៅ)		✓
	Total	**17**	**35**

Annex 3d: Fish species that were not seen or caught in 2022

No.	Fish species	Fish species that were reported to be never seen nor caught in 2022 Koh Chbar village	Fish species that were reported to be never seen nor caught in 2022 Char Thnoal village
1	Catlocarpio Siamesis (ត្រីគល់រាំង)	✓	✓
2	Cirrhinus microlepis (ត្រីព្រួល)	✓	
3	Mekonggina erythrospila (ត្រីប៉ាស៊ីអ៊ី)	✓	
4	Bangana behri (ប៉ារ៉ា)	✓	✓
5	Channa marulioides (ត្រីអំបូង)	✓	✓
6	Rock trout (ត្រីក្រយ៉ាខ្មៅ)	✓	
7	Riahu fish (ត្រីរាហូ)	✓	✓
8	Datniodes undecimradiatus (ត្រីខ្លា)		✓
9	Tontin fish (ត្រីតុងទីន)	✓	N/A*
10	White goat fish (ត្រីពពែសរ)	✓	N/A*
11	Pangasianodon gigas (ត្រីរាជ)	✓	✓
	Total	**10**	**6**

*N/A: these species were not previously seen in the village before.

Small fish being sun dried at a home in Koh Chbar village, 2022. Photo: Chim Chamroeun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