



COALITION FOR INTEGRITY AND SOCIAL ACCOUNTABILITY (CISA)



November 2022

EXECUTIVE SUMMARY

Basin Development Strategy (BDS) for the Mekong River Basin 2021-2030 and MRC strategic plan 2021-2025 focus on gender action plan, and stakeholders' engagement. The adoption of the updated Sustainable Hydropower Development Strategy (SHDS) for the Lower Mekong Basin by the Council of

Ministers of the Mekong River Commission (MRC) in 2021. People living along the Greater Mekong Sub-region (GMS)¹ and Lower Mekong Basin (LMB) are unaware of hydropower risks and impact mitigation guidelines and recommendations, and therefore are unaware of their high risks. The most vulnerable are the people living along the Mekong River who live by traditional ways of fishing, farming and subsistence, and have little understanding of biodiversity and ecosystem.

In Stung Treng, project target areas covered 16 communes/Sangkat, 3 districts and 1 municipality, approximately 5,480 families; the percentage of women household leaders are from 4% to 7.5% of the total families. Most of them are farming and fishing, and other natural resources. To participate in this mechanism for raising awareness of health safety and risk prevention, the Coalition for Social Integrity and Accountability (CISA) has been implementing its project in Stung Treng to promote a safe and healthy ecosystem for humans and animals. Plants and biodiversity along the Mekong River. Project is supported by Pact, Thailand of Mekong Connection Program, United States Department.

CISA works with the community youth network members to conduct action research aim to find out the concern issues of community people on impact of using water and biodiversity along Mekong River in Stung Treng province, and explore the recommendation on how to improve health security and ecosystem health. The action research interviewed with 416 respondents and 8 focus group discussions (FGDs) and 8 key informant interviews (KIIs).

The action research has found that the majority 51% of respondents revealed that irrigation situation and biodiversity along Mekong River changes, and 47% realized that the water level is higher than before. 91% feel afraid of the current situation of the Mekong River. According to MRD (2021)², irrigation impacted the livelihood of the people living Cambodia, Lao PDR, Vietnam, and Thailand – in Cambodia as a whole, flash floods affected 21,411 families in 2019. Moreover, 90% of respondents noticed flood disasters occurred frequently in their communities during the last 5 years. The duration of flooding in 2019 (peak water level exceeding the warning levels) were 9 days at Stung Treng.³

Community people living along Mekong River get the environment and disaster knowledge mostly come from their authorities and Radio/TV (68% and 56% respectively). And, only 6% of them confirmed that they received this knowledge from NGOs/CSOs. From the total respondent, there is 83% of have solutions for their family to minimize disaster risk with traditional approach. And, during the disaster happened, most of them got help from their local authorities 63%.

People are from survey who living in Mekong River, 39% still drink rain water without filtered or boil, and 19% drink water from river/lake/pond directly. From Census (2019)⁴, 73 percent of Cambodian households had access to clean water in 2019. And, data from Water Org (2022) shows that more than 2 million people in Cambodia lack access to safe water, and 3 million lack access to improved sanitation with 77 % of Cambodians living in rural areas, poor access to safe water and sanitation disproportionately affects its rural communities.⁵

Most of community people from survey did not use toilet; 40% dig a hole and 15% use defecation in the open field. However, Census (2019) show that 82.8% of households had toilet facilities in 2019.⁶ And, it is really impacting the environment as 20% throw waste in the open field or water. So, people who are living along Mekong River need to be intervention on their hygiene and sanitation knowledge especially

1 The Greater Mekong Subregion (GMS) comprises Cambodia, Guangxi Zhuang Autonomous Region and Yunnan Province of the People's Republic of China (PRC), the Lao People's Democratic Republic (Lao PDR), Myanmar, Thailand, and Viet Nam by ADB 2019

2 Annual Hydrology, Flood and Drought Report 2019, by MRD 2021

3 Annual Hydrology, Flood and Drought Report 2019, by MRD 2021

4 Cambodia National Census 2019

5 <https://water.org/our-impact/where-we-work/cambodia/>

6 Cambodia National Census 2019

safer water to drink, toilet using and waste management. Ministry of Environment (2019) states that only 60% of waste has fully management in urban area – 40% of waste is remaining in open field⁷. However, MoE set the principal of waste management through Reduce, Reuse and Recycle.⁸

The findings propose a few recommendations to authority, CSOs and stakeholder. The early warning system should have an effective supporting mechanism to make sure that the populations that are at risk can receive the alert, understand it, and most importantly act on it. And, CSOs should work closely with MRC and local authority to delivery of information from national to community level. CSOs should also work with commune council to develop commune Deika to protect some ecosystems areas in community. CSOs also need to worked with related government ministry to implement safety and health policy for the people who are living along Mekong River especially on hygiene and sanitation knowledge.

CSOs should also work with farmers to encourage them to adopt climate-smart agriculture approaches which is resilient to the effects of climate change. CSOs should spend more time with local communities and stakeholders to learn and deepen innovative understanding on how climate-smart agriculture applies to improve their livelihood practices. CSOs should also create savings groups, climate-resilient and more productive agricultural practices, climate-related risk reduction, irrigation advancement, increased access to improved water source, increased access to sanitary facilities to increase agricultural productivity, trade of agricultural products as well as to deal with shock and stress.

⁷ Waste Management in Urban Area 2020-2030 by MoE

⁸ Waste Management in Urban Area 2020-2030 by MoE

ACKNOWLEDGEMENT

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We would also like to thank the commune, Sangkat, district and municipal authorities and all the target people of Stung Treng for their support and cooperation in this smooth research process.

CISA would like to thank Mr. Thovy Hsandy, a research consultant, for providing technical support on the use of the Kobo Toolbox, KII and FGD Tools, and for providing capacity building to community youth networks, data collectors, analysts, and report writing.

We would also like to thank all the CISA staff involved in this research process: Mr. Him Yun, Executive Director of CISA, who is the direct leader for the research process; Mr. Chot Heng, Program Manager, provided technical support and worked directly with the Research Consultant and coordinated the project officer and the community youth network in the target area, and also thank Ms. Ken Chheng Horn, Project Officer for Stung Treng Province, who is working directly with youth networks, and community citizens.

With the good cooperation of the CISA research team, discussed and conducted a questionnaire using Kobo Toolbox, trained research techniques and methods to young people, data collectors’ network, as well as efforts on the project implementation process, public interviews. Citizens and key individuals through KII and group discussions (FDG).

We thank data collectors for accessing information and data that follows our objectives and research during difficult times of climate change and during the rainy season, when travel is difficult and floods occur.

We, CISA, with all the best wishes to all of you.



Him Yun,

Executive Director

The Coalition for Integrity and Social Accountability (CISA)

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ACRONYMS

ART	Advance Research Team
CISA	Coalition for Integrity and Social Accountability (CISA)
CSO	Civil Society Organization
CYNs	Community Youth Networks
FGD	Focus Group Discussion
GMS	Greater Mekong Sub-Region
KII	Key Informant Interview
LMB	Lower Mekong basin
MRC	Mekong River Commission

I- INTRODUCTION

Stung Treng province in one municipality and 3 districts along Mekong River with 16 commune/Sangkats with over 5,480 Families, among those from 4% to 7.5% women household leaders. Land and natural resources are potential livelihoods for Cambodian community citizens living along the Mekong River. They are living dependent on fishery, agriculture, and some other product from natural resources.

Hydropower Risks and Impact Mitigation Guideline and Recommendation are not well aware, for people who are living along Greater Mekong Sub-Region (GMS) and the Lower Mekong basin (LMB), they are living with high risks Meantime, Mekong River Commission policies /guidelines are not disseminated to people along Mekong River, they are living with traditional ways of fishery, agriculture, and livelihood with less aware and understanding on biodiversity, natural resources and ecosystem. Other concerns are about limitation of understanding on good governance, transparency, social accountability and practice socio-economic rights.

On Article 8. State Responsibility for Damages Where harmful effects cause substantial damage to one or more riparians from the use of and/or discharge to water of the Mekong River by any riparian state. the party(ies) concerned shall determine all relative factors, the cause, extent of damage and responsibility for damage caused by that State in conformity with the principles of international law relating to state responsibility, and to address and resolve all issues, difference and disputes in an amicable and timely manner by peaceful means as provided in Articles 34 and 35 of this agreement, and in conformity with the charter of the United Nations.

The other health security are people along Mekong River during flooding/rainy seasons, as we are drinking the same season, as we are drinking the same river water of Mekong River (Cambodia, Vietnam and Lao PDR) there are the needs to understand common policy/guideline and each other on policy, guideline of the MRC of the engagement stakeholder involved in prevention and protection of all kinds of infection, diseases to community citizens. Therefore, it's necessary to conduct awareness raising to citizens about the impacts of natural resource usage, and the interdependence of human, animal, plant, and ecosystem health. By then, citizen engagement in advocacy and policy change and or decision-making processes are needed both at local and national level.

Project “Youth Participation in Health Security, Governance and Policy Advocacy (YP-HeS-GoPA)” has two main objectives and three key approaches:

Table 1: Project Objective and Key Approaches

Project Objectives	Key approaches
<ol style="list-style-type: none"> 1. To promote gender and inclusiveness citizen engagement in process of Deika preparation and approval of the commune/Sangkat councils. 3 of 7 Deika will be approve by commune/Sangkat councils to promote health security, based on the “One Health” approach that recognizes the interdependent of the human, animal, plant, and ecosystem health. 2. To advocate Mekong River Commission office, Ministry of health, and relevant ministries of lower Mekong River policy/guideline recommendation on implementation affected to living conditions of Cambodian citizens to promote health security. 	<ul style="list-style-type: none"> • Establishment of community youth network (CYN) to help citizen engagement in the project activities and play roles as citizen representatives. • Development of Action Research on ecosystem health and health security for citizen living in the target province/district/commune/Sangkat • Enabling environment of citizen engagement for awareness raising advocacy and policy development for ecosystem health at local and national level. Interface and digital platform for citizen engagement will be developed

II- ACTION RESEARCH OBJECTIVES AND QUESTIONS

The project empowers members of CYNs in Stung Treng province to conduct their action research is to get along with the research objectives and questions as below:

Action Research Objectives

- a) To improve community youth network (CYN) on action research process and implementation
- b) To find out the concern issues of community people on impact of using water and biodiversity along Mekong River in Stung Treng province
- c) To explore the recommendation on how to improve health security and ecosystem health.
- d) To utilize the research findings on the advocacy purpose at sub-national, national and regional

Action Research Questions

- a) What are the concerning issues of community people on impact of using water and biodiversity along Mekong River in Stung Treng province?
- b) What are the realistic and effective recommendations on how to improve health security and ecosystem health?
- c) What are the effective strategies on using the research findings to advocate at sub-national, national and regional level?

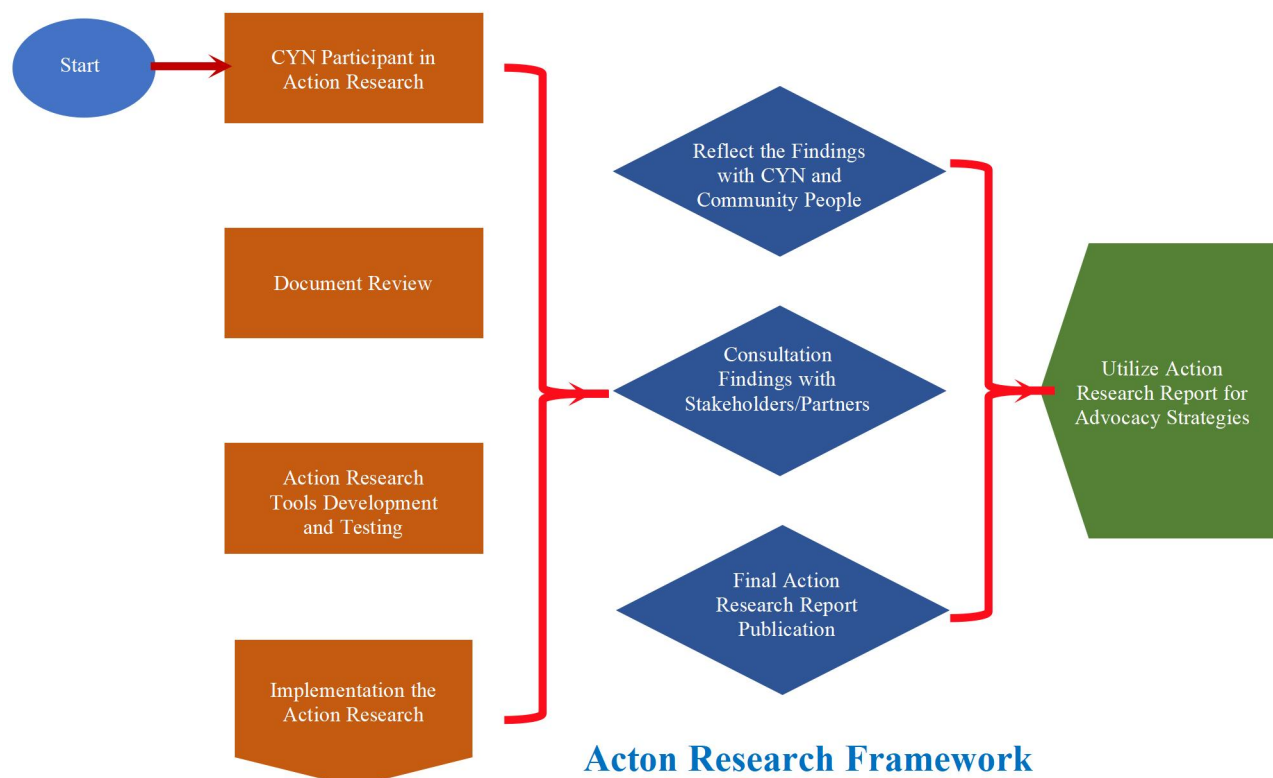
III- ACTION RESEARCH METHODOLOGY

This action research used mix methods design – quantitative and qualitative methods. The quantitative method employed an individual survey with youth who were randomly selected. The qualitative method was conducted with document review, focus group discussions (FGDs), and key informant interview (KIIs) who were selected by purposive and snowball sampling strategies. Area observation was also conducted to gather data for this research.

The research completed with the three steps profess of action research framework; step 1-the action of working with Cambodia youth network (CYN), document review, tools development, testing and capability building, and implementation. Step 2-the reflection of the finding with CYN and community people to gather more inputs, consultation workshop with stakeholders⁹ for comments and finalize report. Step 3-the utilization of action research report for advocacy strategy at national and sub-national levels.

⁹ Online consultation with national and sub-national government, NGOs, and CYN

Figure 1: Action Research Framework



Quantitative Research Method

Sample Size Calculation

To calculate the sample size, this action research used the Yamane (1967) formula of sample size calculation as follows:

$$n = \frac{N}{1 + N(e^2)}$$

N is the population size

e is the acceptable sampling error =5% or 0.05, the confident level is 95%

n is the sample

The total population of in Stung Treng provinces (Siem Bouk, Thala Borivat, Borey Osvay Senchey, Krong Stung Treng districts) was around 10,000 families (Census, 2019)¹⁰. So, the calculation of sample size using Yamane formula resulted in around 400 respondents.¹¹

Qualitative Research Method

To collect qualitative data, the researchers conducted a desk review, 11 key informant interviews (KIIs) and 8 focus group discussions (FGDs). The researchers also developed training protocol and tools to train the research team on the research methods, questionnaire design, data collection plan, data collection

¹⁰ Cambodia National Census 2019

¹¹ At least 20% of the target study who are the SME owner link to FTA benefits

procedure, data quality assurance, data collection technique and note taking. The research team made sure youth volunteers and staff have the capacity to collect quality data from the target areas.

Table 2: Literature Review, FGDs and KIIs

Literature Review	FGDs	KIIs
<ul style="list-style-type: none"> - International and regional trade laws and policies - National trade laws and policies - International, regional and national research findings - FTA and other trade agreements - Reports on Small and Medium Enterprises (SME) context in Cambodia - Other relevant documents 	<p>8 FGDs with youth and small-scale farmers in Phnom Penh city, Ratanakiri, Kampot, and Battambang province</p>	<ul style="list-style-type: none"> -2 KIIs with Local NGOs -2 KIIs with Commune/Sangkat Chief (Osvay, Orai, Stung Treng, Proh Bath, -2 KIIs with Siem Bok District Deputy Governor, and Office Manager) -1 KIIs with Koh Sampeay District Deputy Governor) -1 KIIs with OD Officer -1 KII with Khan Stung Treng council member -1 KIIs with official staff from Provincial of Agriculture, Forestry and Fisheries -1 KIIs with Provincial of Agriculture, Forestry and Fisheries

Area Observation

The survey team conducted the observation at the target areas of data collection. The CYN was observing the status of environment around the areas, focusing on infrastructure, farmlands, forest areas and water level. Every data collector implemented both the survey and observation, and at the end of each area, they had a short reflection meeting with team leaders to report their survey results and the results of the observation around the villages.

Action Research Tool, Process, Beneficiary and Data Quality

Table 3: Action Research Tool, Process, Beneficiary and Data Quality

Items	Qualitative	Quantitative
Tools	<ul style="list-style-type: none"> - Open-end questionnaires - Vulnerability matrix - Historical timeline - Seasonal calendar - Stakeholder analysis 	<ul style="list-style-type: none"> - Close-end questionnaires - Survey questionnaires with KoBo online data collection platform
Process	<ul style="list-style-type: none"> - Document review - Tools design - Data Collection Training - Fieldwork FGDs - Fieldwork KIIs - Fieldwork observation - Data analysis with content analysis 	<ul style="list-style-type: none"> - Document review - Tools design - KoBo Data Collection Platform - Fieldwork and Data Clean - Data analysis with SPSS
Beneficiary	Community people, government staff and CYN members	416 respondents (59% female)
Data Quality	<ul style="list-style-type: none"> - Training - Monitor and Support 	<ul style="list-style-type: none"> - Training - Monitor and Support - Online Database Management

Data Collection Tools

Open-end questionnaires and close-end questionnaires used as the main tools of collection. Innovative data collection is from the field during Covid-19 era, the action research used KoBo toolbox online/offline data collection – this tool will make the data transferred to be fast, accurate and cost effective from target province. In the system, every single data was monitored for any unintentional error from the fields.

The innovative tool was designed to consider the case of Covid-19 seriously outbreak. The traditional way of data collection with paper replaced by online data collection with KoBo Toolbox. The meeting and in-depth interview was conducted online with Zoom, Team, Google Meet, and other social media as convenience ways. Data collectors respected the Covid-19 prevention procedure and were trained and practiced during field work in case face-to-face interview.

Data Quality Assurance and Data Analysis

The data in the research ensured its quality with reliability and validity for analyzing and reporting. The triangulation method made the data reliable from official documents from the government and concrete research findings as the secondary data collection. The methods for primary data collect conducted the consultative and participatory approaches from the data collectors. The data monitoring and supporting confirmed the valid data from field work including condition design in data collection tools. The data collectors received the capacity building on data collection technique and high research ethic thought training, testing, and supporting.

The qualitative data noted and transcribed for analysis as content analysis. The quantitative data tracked from the KoBo toolbox and cleaned in Excel format before interring to SPSS data analysis. The cleaned data e analyzed in SPSS as descriptive statistics, cross tabulation, and inferential statistics as needed. The SPSS outputs transferred to Excel for data presentation with graphs and tables for research finding reports.

Gender Responsive in Survey Process

The gender responsiveness flow in the whole step of the survey. Women, men, people living with disability, elderly people, LGBT, and marginalized people have been included in the whole process of the survey – as in research design, research tools and questionnaires, data collection plan, data analysis, and report. Specifically, the survey report will identify the priority needs, potential contribution opportunity, critical challenges, effective recommendation by crosscheck the gender and social inclusiveness.

Scope of Action Research

The action research scope only 4 districts of Steng Treng province with 416 respondents who living along the Mekong River. The research does not represent the status of the irrigation and ecosystem in the whole Mekong Basin or the whole country.

Challenges of Action Research

The action research faced two main challenges; the first one is the limited knowledge of community youth network as the data collectors. And the second challenge is the target respondent living far away from each other that the researchers need to take more time and resource to conduct the face-to-face interview with them. The solutions implemented by training, coaching and monitoring the data collection from the beginning until the end of data collection. And, project also supported (financial and non-financial) the data collector to travel from house by house to finished the interview – one field staff stayed in Stung Treng to provide support to data collectors.

IV- ACTION RESEARCH FINDINGS

Geographic Information

Figure 2: Map of Stung Treng Province



Stung Treng is a northern province of Cambodia. It was formerly called Xieng Teng and was once a part of the vast Khmer Empire, then the Lao kingdom of Lan Xang and later the Lao kingdom of Champassak. During the period of French Indochina, it was again ceded to Cambodia.

The provincial capital is also named Stung Treng and is an important trade hub with a few hints of Lao influence scattered about, owing to the fact that the Lao border is about 50 km away. It's a friendly, quiet country town situated on the confluence of the San River and the Mekong River. It actually sits on the banks of the San River, with the mighty Mekong coming into the picture on the northeastern outskirts of the town.

The mountainous province of Stung Treng borders Laos to the north. Stung Treng towns are friendly and quiet, situated near the confluence of the San and Mekong rivers and just downstream from the thousand islands. Stung Treng town is a picture-postcard riverside settlement with an economy based on fishing and silk weaving.

The Mekong River between Stung Treng and the Laos border is very light on population and heavy on beautiful scenery. Boulder outcroppings, numerous sets of rapids, swirling pothole currents, wide sweeping stretches of river and forested landscape along the banks all await the boat traveler. It makes for a great trip, either for the traveler that wants to continue on to Laos or for those wanting to enjoy a wild stretch of the Mekong in Cambodia.

The trip is difficult to downright impossible to make on this shallow stretch of the Mekong during the dry season, with countless sunken islands and a virtual forest of trees growing right in the middle of the river. The trip becomes an obstacle course for the boat drivers this time of the year, as they carefully try to choose the best way to guide their craft through the maze that nature has created without losing a propeller to the river. The best time of the year to take this trip is from May to November when sufficient upstream rains have raised the river to a level that allows the boats to pass through carefully.

Table 4: Quantitative Survey Sample

Demographic Information		Total sample: 416
Genders	Female	59%
	Male	41%
Locations	1-Siem Bouk	29%
	2-Thala Borivat	25%
	3-Borey Osvay Senchey	17%
	4-Krong Stung Treng	29%
Family Status	Married	69%
	Single	25%
	Widow/Widower	6%
Education Level	No-Schooling	13%
	Primary School	41%
	Secondary School	25%
	High School	17%
	University	4%

Demographic Information: For the research as the topic above, CISA reached 416 community people from 11 communes/Sangkats in Borey Osvay Senchey, Siembouk, Thala Borivat districts and Stung Treng municipality. They interviewed and answered the research questionnaire which was facilitated by CYN members. As a finding, people reached 41% of male and 59% of female and the kinds of people reached are village leaders, teachers, farmers, and young people who are living along the Mekong River in the above districts and municipality. If we measure those respondents' education level, 13% of them are no-schooling, 41% of them gained Primary School, 25% of them gained Secondary School, 17% of them gained High School and 4% of them gained University. Respondents' family status is 69% of them are married, 25% are single and 6% are widows and widowers (table 2).

Subsequent qualitative interviews: Moreover, for the primary data collection with qualitative method, the research team, community youth network (CYN) members, conducted in-depth interviews with key stakeholders, including decision makers in ministries, media practitioners, and private sector representatives. These aimed to understand their opinion and awareness of the impacts of climate change, what communication affected populations need, and what interventions could support climate change adaptations in the future.

Following analysis of the quantitative survey data and initial qualitative interviews, the research team conducted in-depth interviews with key stakeholders at the sub-national level of government (provincial, district, and commune) and development practitioners (local and international NGOs). In-depth interviews and focus group discussions (FGDs) were also conducted with local influencers, community members, members of vulnerable groups¹⁵, and students.

This subsequent qualitative study had an observational component, which was used to triangulate findings and generate case studies to illustrate how different population groups in Cambodia are taking action in response to the impacts of climate change, and the barriers they face in doing so.

Youth Knowledge on Environment Change and Disaster

To check and understand about environment change and disaster, the research respondents, especially the young people were asked a question that **“have you ever studied or heard about environment change and disaster?”** Then, 84% of the respondents answered “Yes” and 16% of them answered “No”. It means that 84% of the respondents have studied and heard about the environment and disaster, while the 16% respondents have never heard about environment change and disaster. If comparing 5 years of severe climate change from year to year worse, what changes are floods, the rainy season becomes very hot and dry, animals and people face serious sickness, there are more lightning, strong winds, and wildfires.

“There is still limited understanding of the term ‘climate change’ among Cambodians. While nearly three-quarters (72%) of respondents said they had heard of the phrase, only one-third (33%) said they knew what it meant. Just over a quarter (28%) had not heard of the term at all. Government stakeholders interviewed for this study also felt that there was a limited understanding of the technical term ‘climate change’ among the Cambodian population.”, NCSD/MoE. 2020. A Third Study on Understanding Public Perceptions of Climate Change in Cambodia: Knowledge, Attitudes, and Practices, the National Council for Sustainable Development / Ministry of Environment (NCSD/MoE), Phnom Penh, Cambodia, page xi.

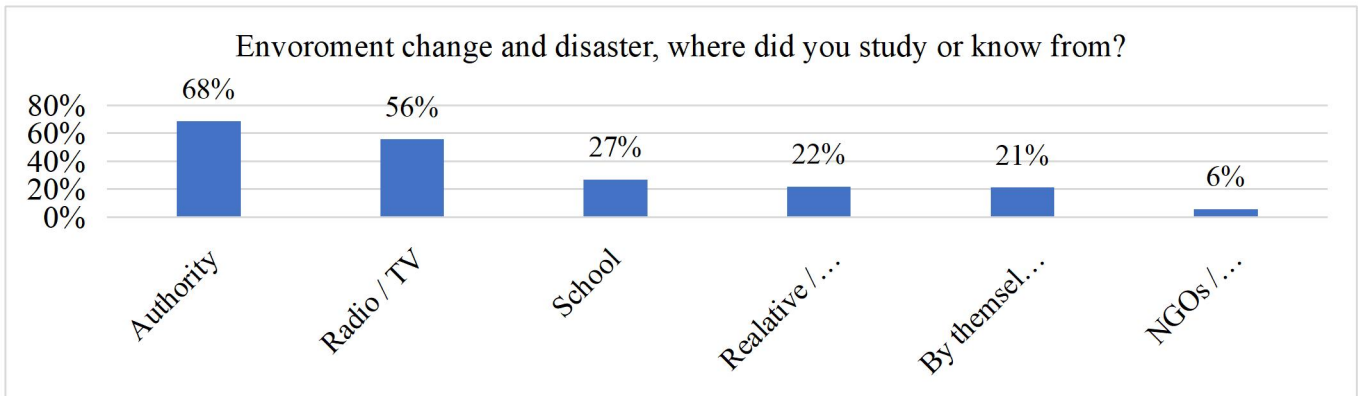


Figure 3: Source of information on Environment and Disaster

In figure 3, among the 416 respondents who responded “yes” ever heard and study about environment change and disaster were asked to provide multiple answer that 68% respondents know from Authority, and only 6% know from NGOs/CSOs and among of respondents, 91% of them you have noticed there are lots of changes in their environment where they live due to the behavior of the community people while 5% of the respondents declined on these changes. Things that changed, based on focus group discussion and door to door visits, are floods full of dirty garbage, pollution in the river due to chemical use of people, Mekong fish endangered by illegal fishing of community people. The sources of environment changes and disaster where the research respondents learnt and knew are from awareness and knowledge distribution of local authorities, Radios/TVs, schools, Relatives/Friends, social media and CSOs.

Figure 4: Irrigation along the Mekong River

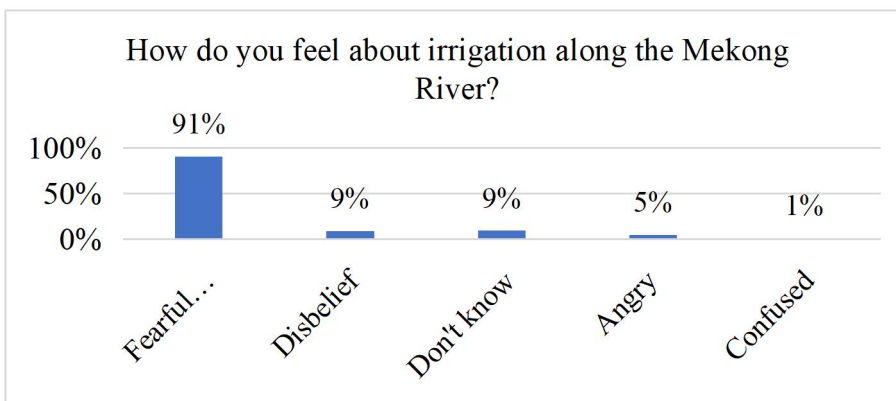
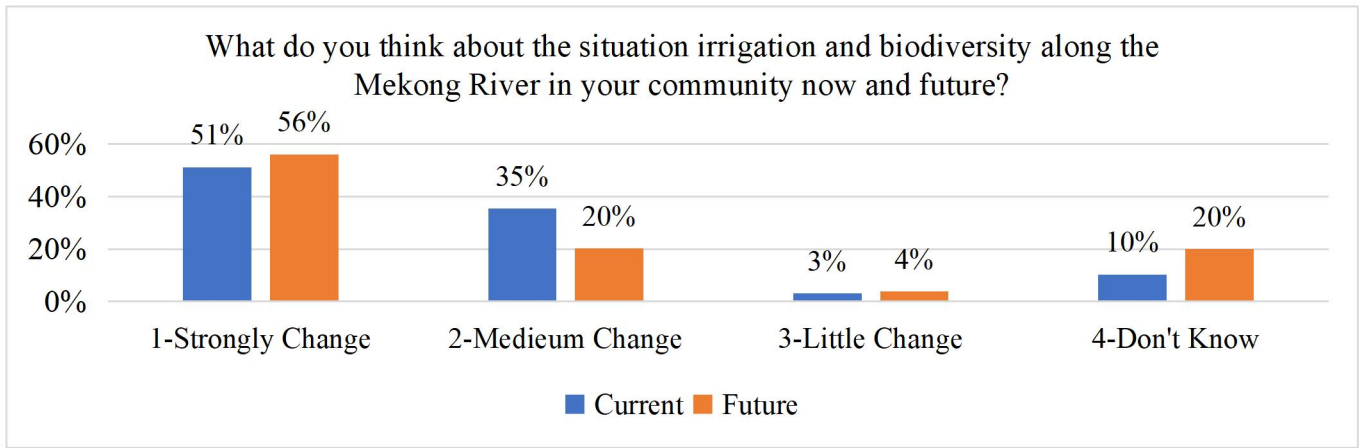


Figure 4 indicates that, 91 % of our respondents were feeling fearful about the irrigation situation of Mekong River. They believed there will be problems in the future. However, 9% of respondents did not believe on the irrigation along the Mekong River, with 9% don't know at all. The respondents also angry 5%, and confused 1%.

Figure 5: Situation irrigation biodiversity along the Mekong River in community now and future



As in figure 5, there were more than half of our respondents also believe that there will be a significant change of the irrigation situation and biodiversity along Mekong River for now (51%) and in the future (56%). There were 35% of them believe there is a medium change for today and 20% for the future. However, there were also 10% of our respondents could not predict of what is happening today and 20% of them could not predict such situation in the future.

Figure 6: The Water level in community

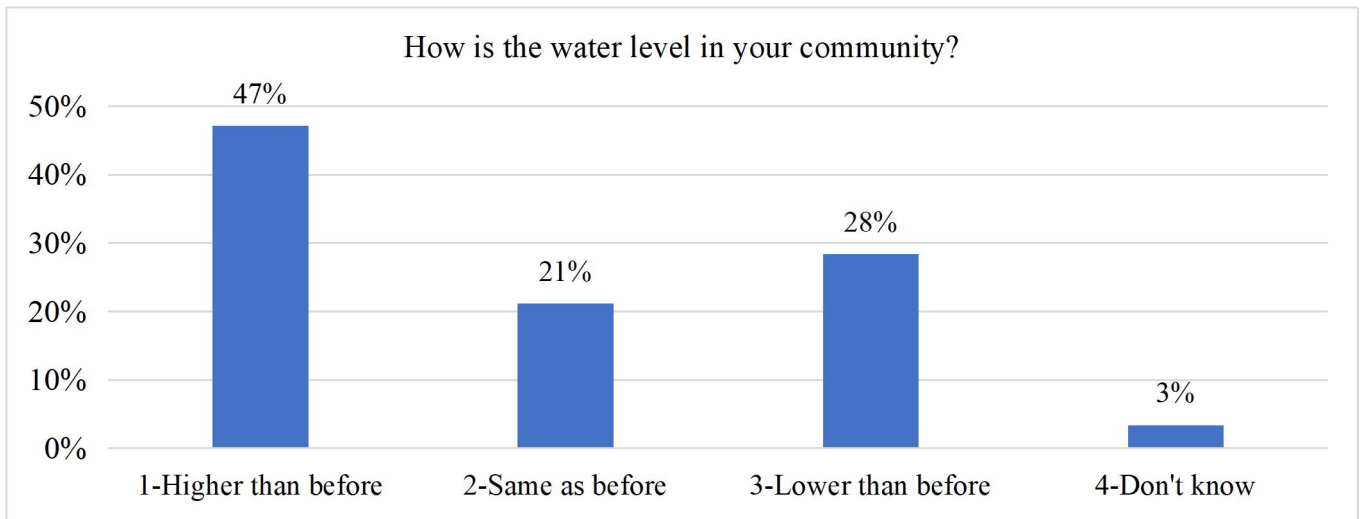


Figure 6 shows that almost half (47%) of our respondents said the water level in community is much higher than before while 21% of them thought it is still the same and 28% of them thought it is much lower than before. However, 3% of respondents answered that they don't know or notice about the water level in their community.

Figure 7: Quality of the Lower Mekong River

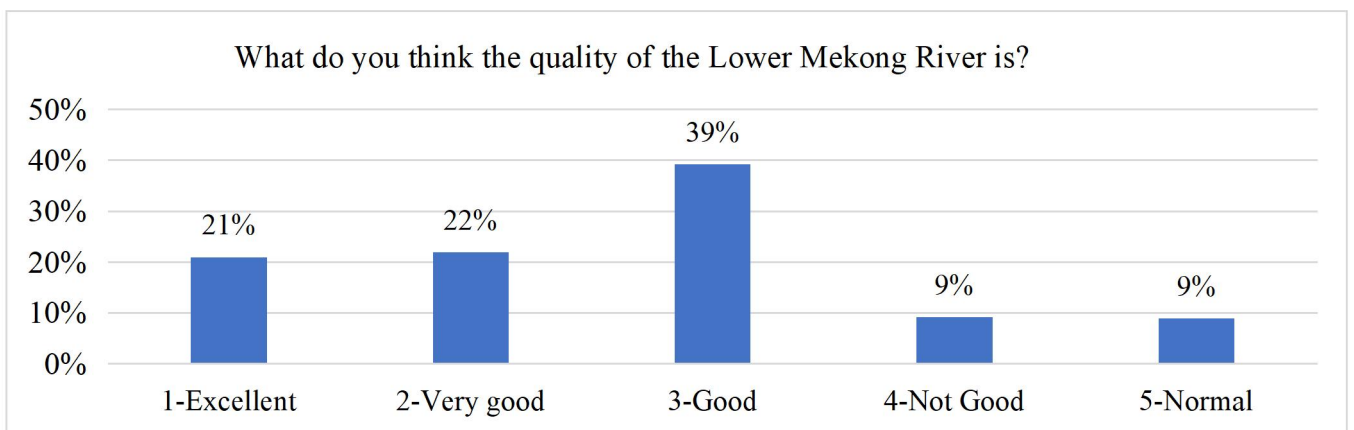


Figure 7 explains the quality of the Lower Mekong River through the perception of our respondents. There were 21% of them believe that the Lower Mekong River is excellent while 22% of them believe it is very good and 39% of them believed it is good and 9% of them expressed it is normal. The rest (9%) were concerning about the quality as not good at all.

Environment Change and Disaster Impact on Livelihood

Figure 8: Impact of irrigation and biodiversity along the Mekong River in your community

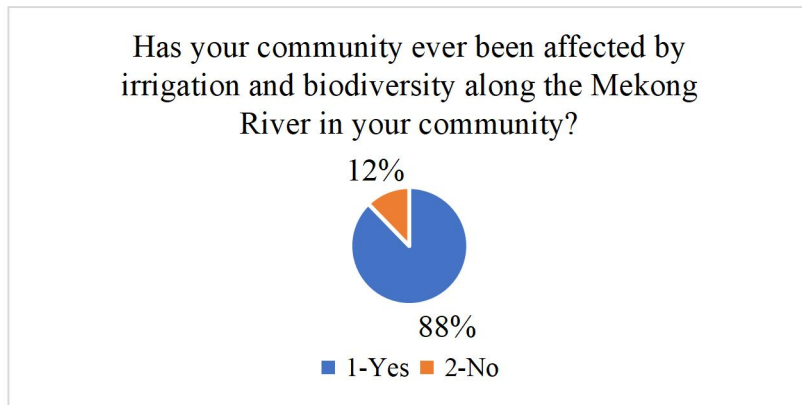


Figure 8 indicates that 88% of our respondents agreed that their community has great contribution to the effect of irrigation and biodiversity system along the Mekong River while 12% of them did not know at all. The irrigation and biodiversity impact the community people on their income generation, agriculture products, their children accessing school, family member health including their animals' health.

Figure 9: Disasters have occurred in the last 5 years (2020-2021) in your community

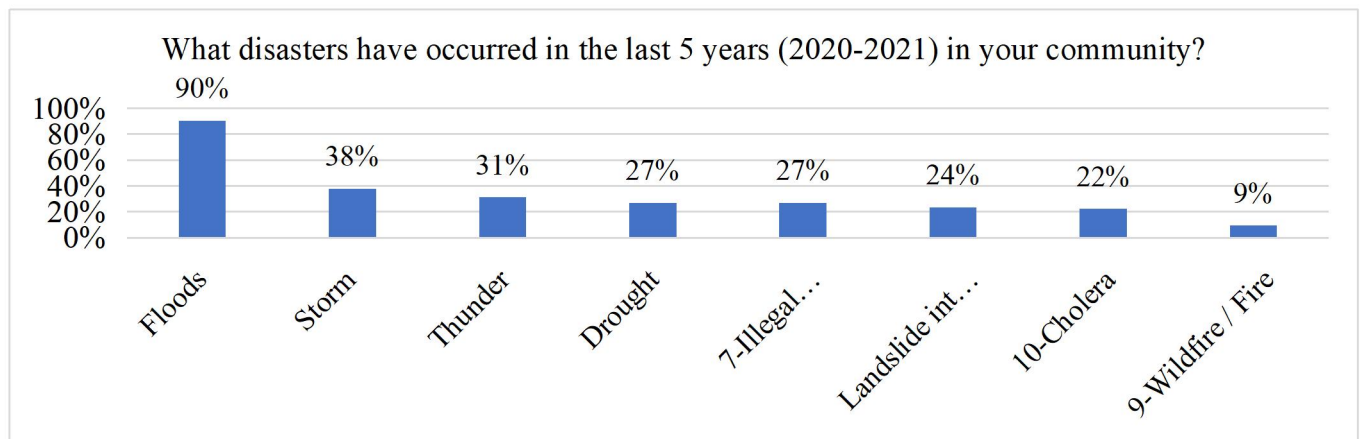
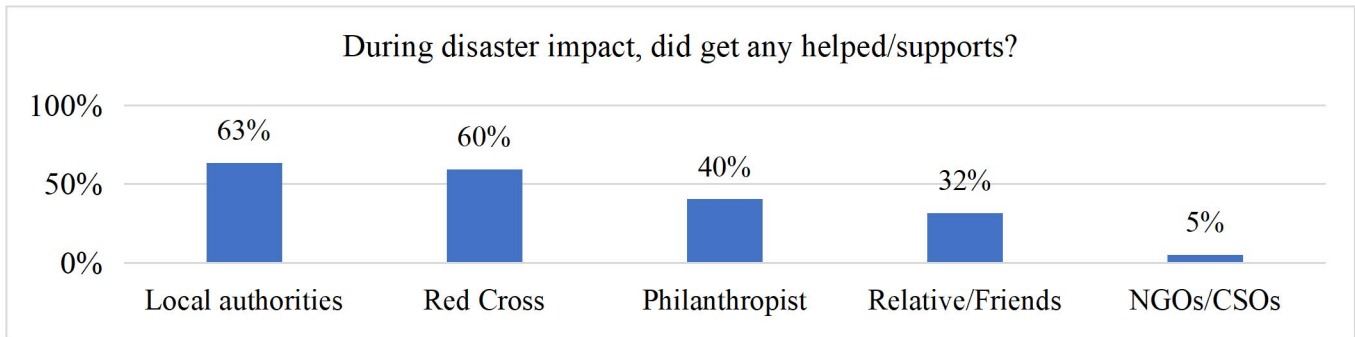


Figure 9 shows that over the last 5 years in our respondents' community, the most occurred disaster was floods (90%) while storm and thunder occurred 38% and 31 %, respectively. Moreover, drought and illegal chemical finishing occurred in the same percentage of 27%. Besides, that there was landslide into the river occurred for 24% and cholera occurred for 22% and the rest was wildfire (9%)

Figure 10: Supports during disaster impact



The respondents could get any supports from the other parties, 63% of them answered that they got help from their local authorities, 60% got support from Red Cross, 40% got from philanthropist, 32% got help from their friends and relatives and only 5% got the help from NGOS (figure 10). The results show that the local authorities still play a key role in their community to support the citizen during the impact from disaster.

Environment Change and Disaster Impact on Health and Security

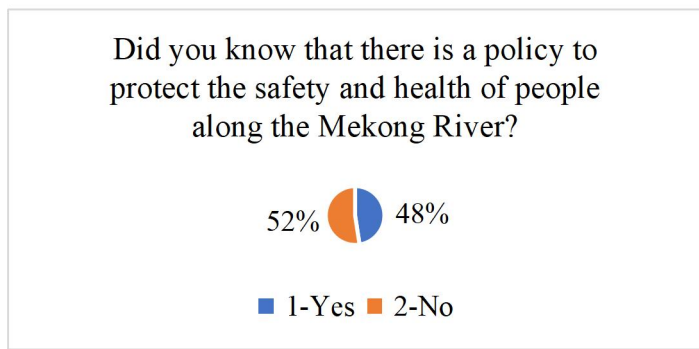


Figure 11: Safety and Health policy of people living along Mekong River

The data in figure 11 show the knowledge or information on the safety and health policy of the people living along Mekong River. 52% of all respondents used to heard the information that the government has policy on safety and health of the people who living along the Mekong River. However, they just heard and did not know the meaning, processing or any intervention of this policy.

Figure 12: Water for drinking for people living along Mekong River

People who living in Mekong River drink different type of water. As in figure 12 the respondents show that 78% drink boil water, 56% filtered water/pure water, 27% well water, 12 clean tap-water. However, 39% still drink rain water without filtered or boil, and 19% drink water from river/lake/pond directly (figure 12).

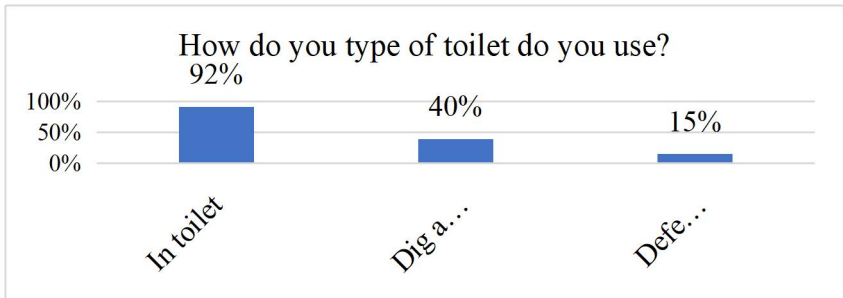
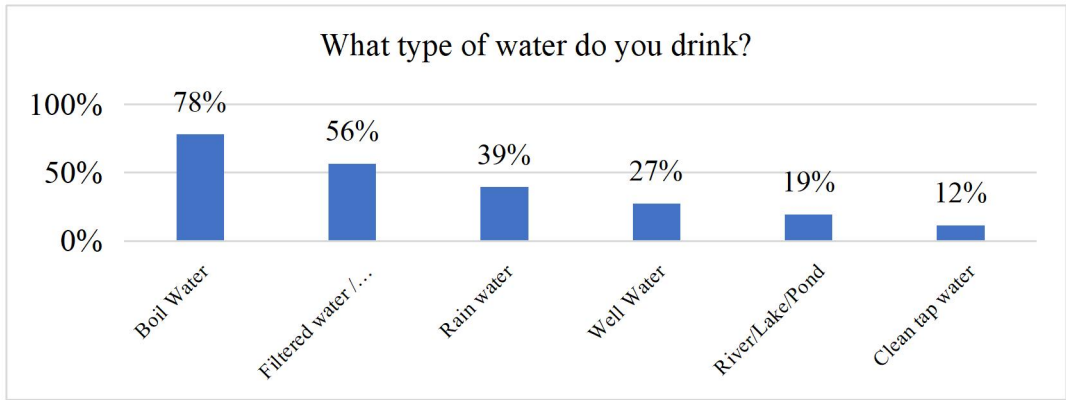


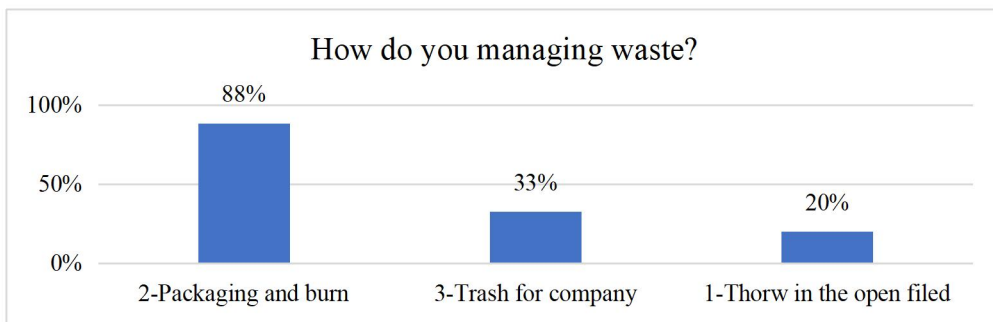
Figure 13: Toilet for using for people living along Mekong River

As shown in figure 13, the respondents 92% use toilet, but 40% dig a hole and 15% use defecation in

the open field. It means that the health and safety of the people who living along Mekong River need to be intervention on their hygiene and sanitation knowledge, and supporting material for building toilet.

Figure 14: Water for drinking for people living along Mekong River

In figure 14 show that the respondents manage the waste by packing and boil 88%, used trash with company service 33%. However, it is really impacting the environment as 20% throw waste in the open field or water.



Adaptation to Environment Change and Disasters

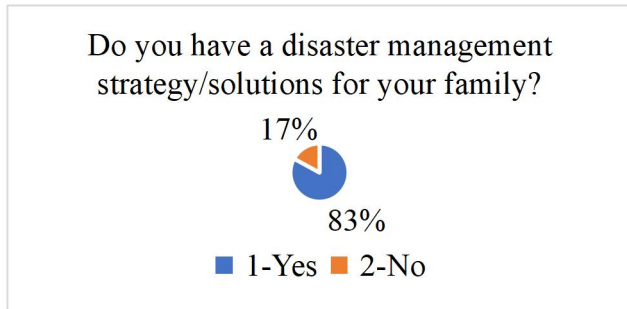


Figure 15: Disaster management strategy/solution for your family

Figure 11 shows that 83% of our respondents agreed that they did have solutions for their family. This means that most of them could know how to deal with disaster management in their community. However, 17% of all respondents did not have any Disaster management strategy/solution for your family. They did not how to do to minimize risk from disaster even before, during and after it occurred.

Figure 16: Solution to control/resist the disaster

Figure 12 indicates the options that our respondents use as strategy for their disaster management. 77% of them chose to follow the weather broadcasting in the TV and social media while 59% of them prepare a backup boat for their family to use when the disaster occur. Moreover, 51% of them chose to build tall houses that are a bit away from the river and 47% of them decided to grow plants along the riverside.

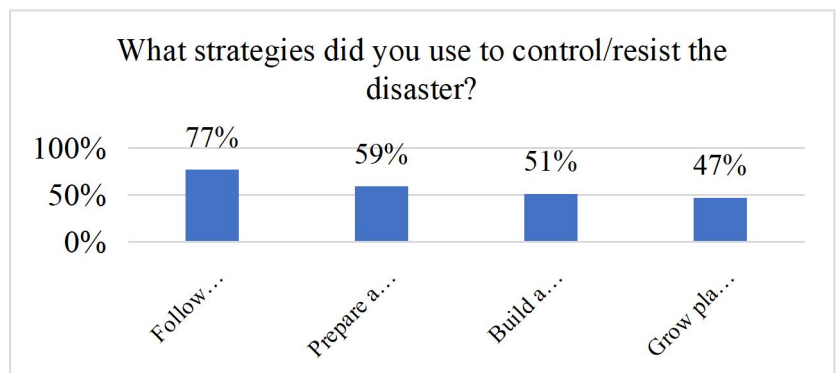
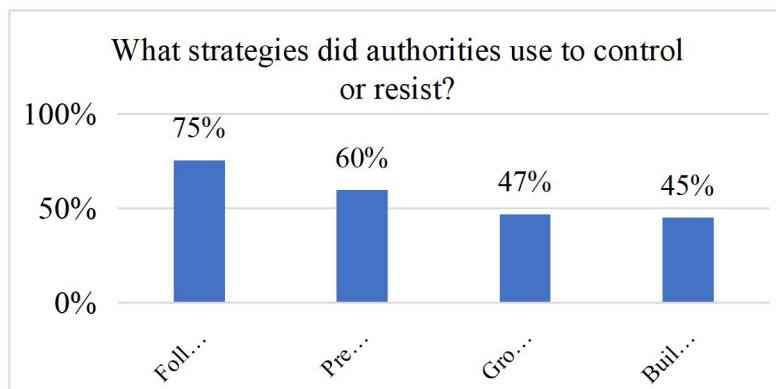


Figure 17: Strategies did authorities use to control or resist disaster in community



From the total respondents, there are 90% of our respondents claimed that their local authorities have disaster management strategies for the community. And in figure 13 explains several strategies that the local authorities use to control disaster management in the community. There were 75% of the strategies was to follow the news about the weather forecasting, 60% prepare a backup boat, 47% grow plants along riverside, and 45% build tall

houses.

Impact of Covid-19

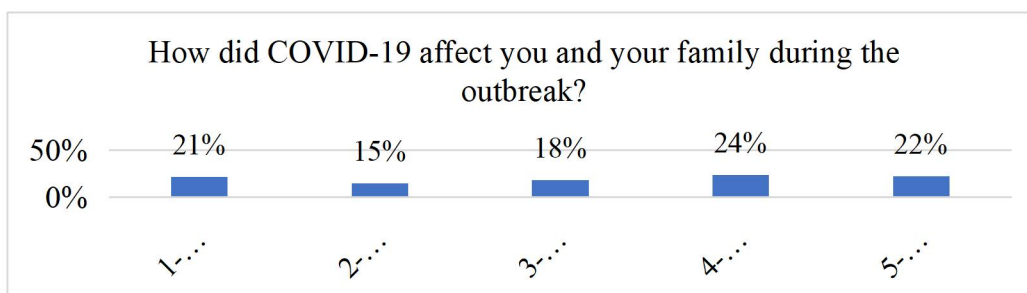


Figure 18: COVID-19 affect you/your family during the outbreak

COVID-19 has affected to the lives of the people in the world. In Cambodia, this pandemic was outbreak in 2020-2021, and still

existed in 2022. Figure 14 shows that 24% of our respondents were strongly affected while 22% were very strongly affected by the COVID-19. However, 21% of them did not receive any effects at all while 15% had little effect and 18% received medium effect.

V- CONCLUSION

Based on this study, it's concluded that the community people in the 4 districts of Stung Treng province notice a change of irrigation and biodiversity in along the Mekong River. The majority of respondents revealed that the changes are already occurring (51% agreed strongly change while other 35% agreed medium change in present). They expected that the changes are still continuing to the future affecting the disaster areas to increase their frequencies and the worsts are yet to come if no properly preventative actions were taken, otherwise will face devastating consequences.

From the total respondents, 47% realized that the water level is higher than before. 91% feel afraid of the current situation of the Mekong River. The higher water level in Mekong River will lead to the increased flood disasters which is adversely impacted on their communities as a whole as well as on their lives and livelihood. 90% of respondents noticed flood disasters occurred in their communities during the last 5 years.

The health and safety of the people who living along Mekong River need to be intervention on their hygiene and sanitation knowledge, and supporting material for building toilet. People who living in Mekong River 39% still drink rain water without filtered or boil, and 19% drink water from river/lake/pond directly, and most of them did not use toilet, 40% dig a hole and 15% use defecation in the open field. It is really impacting the environment as 20% throw waste in the open field or water.

Rural farmers living along the Mekong River are the most vulnerable due to their limited capacity to cope with climate-related risks Even if they demonstrated their ability to have the preparedness plan, but it's not strong enough to make their lives and livelihood resilient to the impact of climate change especially flood and drought disasters. Education is a major issue in struggling to attain sustainable development and poverty reduction in rural riverine communities of the Lower Mekong Basin (LMB). The study found that only 25% of respondents passed the primary education and articulated to secondary schools. The percentage is relatively low in high school education. Only 17% of respondents achieved the high school education attainment. Interestingly, vast majority of respondents (84%) have some level of understanding on environment and disasters. However, they acknowledged that the environment and disaster knowledge mostly come from their authorities and Radio/TV (68% and 56% respectively). The interventions of NGOs/CSOs in Disaster Risk Reduction (DRR) awareness raising and capacity building for community people appeared to the fact that they are less to reach out the rural communities. Only 6% of them confirmed that they received this knowledge from NGOs/CSOs. This maybe that CSOs have commitment and relationship with authorities and coordinate with them to hold accountable for delivery of information transferred from national to grassroot level, as CSOs spend more time with gov't stakeholders in local communities to deepen their understanding on how to locally improve health security. The finding suggested that the interventions with the intention to raise awareness and to support adaptive capacity to be resilient to the impact of climate change, climate-related risk reduction, environmental education and food security should be improved by community-based projects in collaboration with gov't stakeholders and relevant authorities.

During the COVID-19 pandemic, 64%¹² of respondents acknowledged that they had already been affected and their living had been passed through the difficult socio-economic conditions which made them even more vulnerable as food insecurity increased. Many of them lost daily income.

So, the irrigation and ecosystems cause by climate change in Stung Treng province and affected the vulnerable community along the Mekong River. They really need the strongly support from government,

¹² 22% strongly affected, 24% affected and 18% medium affected

CSOs and stakeholders on early warning information, disaster risk reduction knowledge and practice, and commune Deika to protect and reservation the ecosystems.

VI- RECOMMENDATIONS

Generally recognized that natural hazards have been affecting the health security (human, animal, plant and ecosystem) increasingly often. It is necessary to prepare better disaster response and mitigation measures. The research would like to propose the following recommendations:

To Authorities and CSO

- 91% of respondents feel fearful about the Mekong River. The higher water level in Mekong River will lead to the increased flood disasters. Nearly all respondents (90%) experienced flood disasters in their communities during the last 5 years. Slow onset and flash flood were induced by heavy rainfall or the release of water from the hydropower dam. This has a negative impact on agricultural productivity, threatening food security for smallholder farmers. The gov't issued the early warning system to correctly identify an incoming hazard for their population especially for those are at risk. However, it is not yet enough. It's recommended that The system should have an effective supporting mechanism to make sure that the populations that are at risk can receive the alert, understand it, and most importantly act on it. This also includes building disaster resilience framework for preventing crises and promoting recovery especially for the most vulnerable one living along the LMB.
- Disaster management resource should be allocated for information sharing platform and resources through existing CSO Support Network/Mechanism to help CSOs become fully functioning partners with relevant gov't agencies to identify intervention in response to mitigation measure of climate risks and vulnerability to the development of their strategic plan. A fully functioning CSOs will play an important role in coordination and delivery of information from national to grassroots level.

To CSO and Stakeholders

- Communities living along the LBM are very poor and lack sufficient resources and knowledge to prepare and respond against climate shocks and emergencies. CSOs should work with farmers to encourage them to adopt climate-smart agriculture approaches which is resilient to the effects of climate change. CSOs should spend more time with local communities and stakeholders to learn and deepen innovative understanding on how climate-smart agriculture applies to improve their livelihood practices
- CSOs in collaboration with gov't stakeholders and local authorities need to work with the villagers in rural riverine communities of LMB to implement diverse key community-based projects such as savings groups, climate-resilient and more productive agricultural practices, climate-related risk reduction, irrigation advancement, increased access to improved water source, increased access to sanitary facilities. This enables them to increase agricultural productivity, trade of agricultural products as well as to deal with shock and stress. A tendency of villagers on natural resources would be gradually decrease. This is part of coping strategy to deal with the irrigation and biodiversity change
- CSOs should work with Ministry of Rural Development and Water Resource Management Committee to implement health and safety policy for the people who are living along Mekong River. They should work together to provide the capacity building to local authorities and raised awareness to community people on hygiene and sanitation especially on safe water for drinking, manage waste, using toilet and waste management. They should provide both fanatical and non-financial supports.

VII- ANNEX

Annex 1: Survey Questionnaire

The Coalition for Integrity and Social Accountability (CISA)

"Action research on the impact of irrigation and biodiversity changes along the Mekong River on people in Stung Treng, Cambodia"

Introduce

My name is _____ and I am a researcher for an independent research team. We are Youth Volunteers for the Coalition for Social Integrity and Accountability (CISA) who have been researching the impact of irrigation and biodiversity changes along the Mekong River on people in Stung Treng.

This research will take about 30 minutes. Your response will be kept confidential, independent and private, and all your answers will be analyzed as a joint report. You can refuse to answer any questions and stop giving interviews at any time. However, all of your responses are very important for this research.

Research Purpose

1. Strengthen the capacity of youth networks on the implementation of active research
2. Explore the impact of changes in irrigation and biodiversity along the Mekong River on the people in Stung Treng province.
3. Extract effective recommendations to strengthen irrigation and biodiversity along the Mekong River
4. Use research findings to seek support to strengthen irrigation and biodiversity along the Mekong River at the national and sub-national levels.

Do you agree to participate in the survey?

Yes ___ / No _____, if no, please stop the interview

Data Collector Name: _____

Interview Date: _____

Interview location: _____ village, _____ commune, _____ district, province / city

No.	Question	Answer	Skip
I-Demographic Information of Respondent			
Q1	Gender	1-Male 2-Female 3-Other (LGBT)	
Q2	Age of respondent	_____	
Q3	Level of education	1-Don't study 2-Primary class 3-Secondary level 4-High school 5-University	
Q4	Ethnicity	1- Khmer	

		2- Vietnam 3- China 4- Islam 5-Other (.....)	
Q5	Respondent's family status	1- Single 2- Married 3-Divorce (widow / widower)	
Q6	Respondent's Disability Status	1- Have a disability 2-No disability	
Q7	Respondent's main Job	1-Housewife 2-Students 3-Government work, private company, organization 4-Personal business / family 5-Fishing 6-Employees of a group of private companies	
II-Knowledge about environment and disaster			
Q8	How many years do you live here?	Years	
Q9	Have you ever study or heard about environment change and disaster?	1-Yes 2-No	=>Skip to q11
Q10	If Yes, Where did you study or know from?	1-Authority 2-NGOs / CSOs 3-Relative / Friend 4-School 5-Radio / TV 6-By themself (FB, IG, YouTube) 7-Other	
Q11	Have you noticed any changes in your environment where you live?	1-Yes 2-No	
Q12	How do you feel about irrigation along the Mekong River?	1-fearful/afraid 2-angry 3-disbelief 4-confused 5-don't know	
Q13	What do you think about the situation of eco-system and biodiversity along the Mekong River?	1-Strongly Change 2-Average change 3-Little change 4-Don't know	
Q14	What do you think about the situation irrigation and biodiversity along the Mekong River in your community?	1-Strongly Change 2-Medium change 3-Little change 4-Don't know	
Q15	What do you think about the situation irrigation and biodiversity along the Mekong River in your community in the future?	1-Strongly Change 2-Medium change 3-Little change 4-Don't know	
Q16	How is the water in your community?	1-Higher than before 2-Same as before 3-Lower than before 4-Don't know	
Q17	What do you think about the future	1-Higher than	

	water situation?	before 2-Same as before 3-Lower than before 4-Don't know	
Q18	What do you think the quality of the Lower Mekong River is?	1-Excellent 2-Very good 3-Good 4-Not good	
III- Environmental change and disasters have economic and livelihood impacts			
Q19	Has your community ever been affected by irrigation and biodiversity along the Mekong River in your community?	1-Yes 2-No	=> Skip
Q20	If ever, what disasters have occurred in the last 5 years (2020-2021)?	1-Storm 2-Thunder 3-Flood 4-Landslide into the river 5-Drought 6-Water destroy from local people 7- Illegal chemical fishing 8- Dangers from hydropower 9- Wildfire / Fire 10- Cholera	
Q21	During the disaster, did your health and those of your family members be affected?	1-Yes 2-No	
Q22	If yes, how much?	1-little affected 2-Medieum affected 3-Affected 4-Extremely affected	
Q23	During health effected, did get any helped?	1-Local authorities 2-NGOs/CSOs 3-Relative / Friend 4-Philanthropist 5-Red Cross 6-Other	
Q24	If yes, Where does that help come from?	1-Local authorities 2-NGOs/CSOs 3-Relative / Friend 4-Philanthropist 5-Red Cross 6-Other	
Q25	Have the water of the Lower Mekong River helped the agriculture of the local people?	1-Yes 2-No	=> Skip
Q26	If yes, How much?	1-Can't Helped 2-Little Helped 3-Helped 4-Very helpful 5-Strongly Helped	
IV- Environmental change and disasters impact on safety and health			
Q27	Did you know that there is a policy to protect the safety and health of people along the Mekong River?	1-Yes 2-No	=> Skip
Q28	If yes, What does that principle say or tell us?	_____	
Q29	How do you think people living along	1-River/Lake/Pond	

	the Mekong River drink water?	2-Filtered water/Pure water 3-Well water 4-Rain 5-Boil water 6-Clean tap water	
Q30	How do you think people live along the Mekong River use the toilet?	1-Defecation in the open field 2-Dig a hole 3-In toilet	
Q31	How do you think people living along the Lower Mekong River have a habit of managing plastic waste?	1-Throw in the open filed 2-Packaging and burn 3-Package for company	
Q32	What is the attitude of the people along the Lower Mekong River towards the use and management of chemical wastes and toxins?	1-Not good 2-Good 3-Very good	
V-Adaptation to environmental change and disasters			
Q33	Do you have a disaster management strategy/adaption for your family?	1-Yes 2-No	=>Skip to q35
Q34	If yes, what strategies did you use for disaster risk reduction/adaption?	1- Follow weather news 2-Build a house high and away from the river 3-Grow plane along riverside 4- Prepare a backup boat 5-Other	
Q35	Do local authorities have disaster management strategies for the community?	1-Yes 2-No	=>Skip
Q36	If yes, What strategies did authorities use for disaster risk reduction/adaption?	1- Follow weather news 2-Build a house high and away from the river 3-Grow plane along riverside 4- Prepare a backup boat 5-Other	
Q37	How effective are the measures or the implementation of the authorities' tactics?	1-Not efficiency 2-Some efficiency 3-Better efficiency	
VI-Covid 19 effective			
Q38	How did COVID-19 affect you and your family during the outbreak?	1-Not affect 2-Little affect 3-Medium effect 4-Very affect 5- Strongly affect	
Q39	Did you receive any equity fund support during that time?	1-Yes 2-No	=>Skip to q42
Q40	Who provided that equity fund to you?	1-Authority 2-NGOs/CSOs 3-Realative/Friend 4-Philanthropist 5-Other	
Q41	What did you get out of that support?	1-Pill 2-Buget 3-Foods 4-Acohol/Handwash gel 5-Mass 6-Other	
Q42	Finally, do you have any additional		

ideas to improve the living conditions of the people in the Lower Mekong River?		
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Annex 2: KII Questionnaire

The Coalition for Integrity and Social Accountability (CISA)

"Action Research on the Impact of Irrigation and Biodiversity Changes along the Mekong River on People in Stung Treng, Cambodia"

Key Informant Interview (KII)

Introduce

My name is _____ and I am a researcher for an independent research team. I am a Youth Volunteers for the Coalition for Social Integrity and Accountability (CISA) who have been researching on the impact of irrigation and biodiversity changes along the Mekong River on people in Stung Treng.

This research will take about 30 minutes. Your respond will be kept confidential, independent and private, and all your answers will be analyzed as a joint report. You can refuse to answer any questions and stop giving interviews at any time. However, all of your responses are very important for this research.

Research Purpose

1. Strengthen the capacity of youth networks on the implementation of active research
2. Explore the impact of changes in irrigation and biodiversity along the Mekong River on the people in Stung Treng province.
3. Extract effective recommendations to strengthen irrigation and biodiversity along the Mekong River
4. Use research findings to seek support to strengthen irrigation and biodiversity along the Mekong River at the national and sub-national levels.

Do you agree to participate in the survey?

Yes ___ / No _____, if no, please stop the interview

Name of Interviewer: _____

Interview Date: _____

Interview location: _____ village, _____ commune, _____ district, province / city

Name of Interviewee: _____, Position: _____

Questions

1. What are the water and biodiversity issues in your community? What extent of its impacts on your community?
2. What are the concerning issues of community people on the impact of using water and biodiversity in your community?
3. What are the interventions of the government on the impact of water and biodiversity issues in your community?

4. What are the interventions of the NGOs on the impact of water and biodiversity issues in your community?
5. What are the community practices on the impact of water and biodiversity issues in your community?
6. What are the realistic and effective recommendations on how to improve health security and ecosystem health in your community?

Annex 3: FGD Questionnaires

The Coalition for Integrity and Social Accountability (CISA)

"Action Research on the Impact of Irrigation and Biodiversity Changes along the Mekong River on People in Stung Treng, Cambodia"

Focus Group Discussion (FGD)

Introduce

My name is _____ and we are the researchers for an independent research team. We are Youth Volunteers for the Coalition for Social Integrity and Accountability (CISA) who have been researching the impact of irrigation and biodiversity changes along the Mekong River on people in Stung Treng.

This research will take about 30 minutes. Your response will be kept confidential, independent and private, and all your answers will be analyzed as a joint report. You can refuse to answer any questions and stop giving interviews at any time. However, all of your responses are very important for this research.

Research Purpose

1. Strengthen the capacity of youth networks on the implementation of active research
2. Explore the impact of changes in irrigation and biodiversity along the Mekong River on the people in Stung Treng province.
3. Extract effective recommendations to strengthen irrigation and biodiversity along the Mekong River
4. Use research findings to seek support to strengthen irrigation and biodiversity along the Mekong River at the national and sub-national levels.

Do you agree to participate in the survey?

Yes ___ / No _____, if no, please stop the interview

Name of General Coordinator: _____ Name of Facilitator: _____ Note Taker Name: _____

Interview Date: _____

Interview location: _____ village, _____ commune, _____ district, province / city _____

Total participants: _____ (women _____), people who disabilities _____), Indigenous _____

The role of the facilitator

General Facilitator:

- Set up discussion venues and tools to use
- Observe participants and help you ask questions in case of ambiguity or lack of any questions
- Facilitate participants to stick or write their answers.

Facilitator:

- Must be fluent and understand all questions
- Ask questions to the group and explain all the questions.
- Encourage all participants to answer

Note Takers:

- Have a book or paper for note daily information of each person in the group
- Ask for additional confirmation if not note yet or not clear
- Remind the questioner if any questions are missing

No.	Question	Methods for facilitators																		
Tools1: Climate Change Seasonal Calendar (20Min)																				
Q1	What has caused climate change in the past 5 years?	Encourage respondents to think during the last 5 years Be inspired by hot, cold, different weather Draw on a piece of paper the time in 2021 about the weather that changes from month to month, specifying which month of the dry season? How does it compare to 5 years ago?																		
Tools 2: History of disaster Historical Timeline (20min)																				
Q2	What have been the disasters and damage in the past 5 years?	Draw on a flip chart showing the current year back to 5 years ago. <table border="1" data-bbox="651 1301 1375 1682"> <thead> <tr> <th>Years</th> <th>Disaster</th> <th>Damage</th> </tr> </thead> <tbody> <tr> <td>2022</td> <td></td> <td></td> </tr> <tr> <td>2021</td> <td></td> <td></td> </tr> <tr> <td>2020</td> <td></td> <td></td> </tr> <tr> <td>2019</td> <td></td> <td></td> </tr> <tr> <td>2018</td> <td></td> <td></td> </tr> </tbody> </table>	Years	Disaster	Damage	2022			2021			2020			2019			2018		
Years	Disaster	Damage																		
2022																				
2021																				
2020																				
2019																				
2018																				
Tools 3: Stakeholder Analysis (20min)																				
Q3	Before the disaster, who was involved to help? During the disaster, who was involved to help? After the disaster, who was involved to help?	<table border="1" data-bbox="651 1787 1375 2002"> <thead> <tr> <th>Time</th> <th>Name of related entities that helped</th> <th>Assisted activities</th> </tr> </thead> <tbody> <tr> <td>Before the disaster</td> <td></td> <td></td> </tr> <tr> <td>During the disaster</td> <td></td> <td></td> </tr> </tbody> </table>	Time	Name of related entities that helped	Assisted activities	Before the disaster			During the disaster											
Time	Name of related entities that helped	Assisted activities																		
Before the disaster																				
During the disaster																				

		After the disaster		
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Annex 4: Photos



Annex 5: About Consultant

Mr. THOVY Hsandy (Cambodian), ART team leader, who earned MBA in Management, and professional courses on M&E, research, advocacy, GEDSI, and data management. Hsandy has acquired more than ten-year experience as a full-time staff and consultant for UN agencies, Cambodia Ministries, international and national NGOs on program baseline survey and final evaluation, M&E systems design, program management, and staff capacity building, and evidence-based advocacy practiced in Cambodia. His proficiency in data analysis with SPSS, Excel, ACCESS, STATA, Power BI, NVivo, and Infographic. Phone: +855978866062, Email: thovyhsandy@yahoo.com.