

RESEARCH REPORT

FISH CATCH MONITORING

KANG SPEU, KOAH SNAENG, KRABEI CHRUM,
SAMKHOUY, SRAE SRANOK VILLAGE, STUNG
TRENG PROVINCE



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Abbreviation

CPUE	: Catch Per Unit Effort
CS	: Control Site
IP	: Indigenous Peoples
PS	: Project Site

Abstract

The objective of the research on Fish Catch Monitoring was to analyze the Catch Per Unit Effort (CPUE) specifically related to gillnet operations in six villages in Stung Treng province. The research was conducted in Kang Speu, Koah Snaeng, Krabei Chrum, Samkhoy, Sdao 1, and Srae Sranok villages. Data on fish catch were collected twice a month from two fishers in each village.

The findings of the research revealed variations in CPUE values across different villages and months. In Kang Speu village, both the project site and control site exhibited fluctuating CPUE values, indicating varying levels of fishing productivity. The CPUE in the project site ranged from 50.34 in August to 30.22 in October 2022, while the CPUE in the control site ranged from 26.76 in August to 53.27 in October. The total CPUE, combining both sites, ranged from 38.55 in August in 2022 to 41.74 in October 2022.

Similarly, in Koah Snaeng village, the CPUE values also varied between the project site and control site. The combined CPUE for both sites ranged from 28.16 to 47.22 over several months.

In Krabei Chrum village, the CPUE values fluctuated in both the project site and control site throughout the monitoring period. The CPUE in the control site ranged from 48.62 in May 2022 to 8.75 in November and December. In the project site, the CPUE ranged from 29.08 in May 2022 to 8.22 in December 2022.

In Sdao 1 village, the CPUE values showed variations, with some months exhibiting higher CPUE values and others showing lower values. The CPUE in the control site ranged from 103 in January to 8.43 in December. In the project site of Srae Sranok village, the CPUE also varied throughout the monitoring period, with the CPUE ranging from 72.8 in May 2022 to 8.80 in December 2022.

Based on these findings, it is recommended to conduct fish monitoring (CPUE) in all six villages using consistent fishing gear to provide a more comprehensive understanding of fish abundance and fishing efficiency across a wider area. This will allow for more reliable comparisons between the project site and control sites. Additionally, extending the research duration to cover a full year and collecting data consistently throughout all seasons will capture seasonal variations and provide a more complete assessment of CPUE dynamics. These measures will contribute to the effective management and sustainability of fish catch in Stung Treng province.

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We would like to acknowledge the MVi Management Team, particularly Dr. Lonh Pichdara, MVi Executive Director, and Sin Koemsen, Operational Support Coordinator. Their oversight and guidance have been invaluable throughout the project. We would also like to thank all our colleagues at MVi for their administrative support, ensuring the smooth running of the project.

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1. INTRODUCTION

1.1. Research Rationale

According to Baran and Borin (2012), the Mekong River is the second richest river in terms of fish biodiversity, surpassed only by the Amazon. It supports the largest freshwater fisheries globally, contributing to 6-18% of the global freshwater fish catch. The Mekong fisheries are of utmost importance for ensuring food security in the Lower Mekong Basin, where fish provides 81% of the protein intake in Cambodia and 48% in Laos. Additionally, the fisheries offer employment to 1.6 million Cambodians and are crucial for the livelihoods of many people, particularly in the Mekong Delta in Vietnam (Baran & Borin, 2012).

However, the construction of dams in the Mekong Basin poses a significant concern due to the region's high fish biodiversity, productivity, exploitation rate, and long-distance fish migrations (Baran & Borin, 2012). Dams can disrupt fish migration patterns, alter river flow, and negatively impact the overall health of the fishery resources (Mekong River Commission, 2002).

According to My Village Organization (2022), the objective of the project is to enhance the capacity of rural communities in managing fishery resources. In collaboration with various local entities such as the Stung Treng Provincial Fisheries Administration, the Stung Treng Provincial Department of Agriculture, the commune council, and the district authority, the organization has provided support to 18 fishing communities across 18 villages, 13 communes, and four districts in Stung Treng province (My Village Organization , 2022).

One of the key goals of the project is to increase fish stocks in the project sites, thereby contributing to the improvement of both indigenous peoples (IP) and rural communities' livelihoods (My Village Organization , 2022). However, it is noted that there is a lack of documentation regarding fish resources in the area (My Village Organization , 2022).

1.2. Research Objectives

- To analyze the Catch Per Unit Effort (CPUE) specifically related to gillnet operations in the six villages of Stung Treng province.

1.2. Research Scopes

- The fish catch analysis is limited to gillnet fishing only. Other fishing methods or gear types are not considered in this study. Therefore, the findings may not fully represent the overall fish catch in the study area.
- The data collection was conducted for only a few months in the year due to budget constraints. This limited timeframe may not capture seasonal variations in fish abundance and fishing patterns, potentially impacting the comprehensiveness of the findings.

- The fish data was collected from a small sample size of only nine fishers residing in six villages within Stung Treng province. This limited sample may not fully represent the diversity of fishing practices and fish populations in the entire province.
- The data collected from different villages were collected during different periods or months, making it challenging to directly compare the fish data between villages. This may limit the ability to draw conclusive comparisons or identify broader trends across the study area.
- In some villages, fishers used different gillnet mesh sizes between control and project sites. This discrepancy in gear usage may affect the Catch Per Unit Effort (CPUE) analysis, making it difficult to compare the effectiveness of gillnet operations between control and project sites.

1.3. Research Model

The CPUE model also known as the Catch Per Unit Effort model introduced by Wayne and Mary (n.d.), was utilized in this study to estimate the abundance of a specific fish species in six villages (including control sites and project sites) during the year 2022. The methodology involved measuring the quantity of fish (in grams) captured per unit of fishing effort per hour of fishing (Wayne & Mary).

The provided table presents the research model and gillnet unit specifications for different villages in the study. The CPUE (Catch Per Unit Effort) is measured in grams per hour per gillnet unit. The villages are divided into control sites and project sites.

For the village of Kang Speu, both the control site and project site use gillnets that are 80 meters long, 1.50 meters in height, and have a mesh size of 6 centimeters. Similarly, in Koah Snaeng, both the control site and project site utilize gillnets that are 100 meters in length, 1.50 meters in height, with mesh sizes of 3.21 centimeters and 3.14 centimeters, respectively.

In Krabei Chrum, the control site employs a gillnet that measures 40 meters in length, 3.50 meters in height, and has a mesh size of 4 centimeters. In contrast, the project site uses a gillnet that is 27.27 meters long, 3.64 meters in height, and has a mesh size of 5.94 centimeters.

For Samkhoy, the control site and project site both use gillnets that are 24 meters in length, 2.4 meters in height, and have a mesh size of 4.8 centimeters. The gillnet specifications for Sdao 1 and Srae Sranok are also provided, but there is no information on the gillnet unit used in Sdao 1.

Table 1: Research Model and Gillnet Unit

CPUE	Villages	Gillnet Unit	
		Control Site	Project Site
Gram/hour/ gillnet unit	Kang Speu	80-meter-long, 1.50-meter-height, 6-cm-mes	80-meter-long, 1.50-meter-height, 6-cm-mes
	Koah Snaeng	100-meter-lengt, 1.50-meter-height, 3.21-cm-mesh	100-meter-lengt, 1.50-meter-height, 3.14-cm-mesh
	Krabei Chrum	40-meter-length, 3.50-meter-height, 4-cm-mesh	27.27-meter-length, 3.64-meter-height, 5.94-cm-mesh
	Samkhouy	24-meter-length, 2.4-meter, 4.8-cm-mesh	24-meter-length, 2.4-meter, 4.8-cm-mesh
	Sdao 1	50-meter-length, 2.84-meter-height, 6.56-cm-mesh	
	Srae Sranok	30-meter-length, 2.50-meter-height, 5.67-cm-mesh	

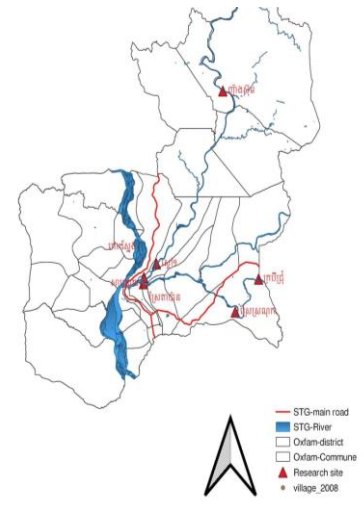
2. RESEARCH METHODOLOGY

2.1. Research Sites

The research study was carried out in six villages located in four communes, three districts, Stung Treng province, Cambodia. These villages include Kang Speu, Koah Snaeng , Krabei Chrum, Samkhouy, Sdao 1 and Sre Sranok (Stung Treng Provincial Administration, 2021) .

Kang Speu in Nhang Shum commune, Siem Pang district. Sdao 1 in Sdao commune, Sesan district, Sekong province. These two villages are located along Sekong river. Koah Snaeng in Koah Snaeng commune, Borey O'Svay district. This village is located along Mekong River about 25 kilometer from Stung Treng town (Stung Treng Provincial Administration, 2021) ..

Map 1: Research Sites



Krabei Chrum and Srae Sranok villges are located in Kbal Romeas commune, Sesan district. These villages are located on Srae Pok river while Samkhouy is situated in Samkhouy comun. The research sites are shown in Map 1 (Stung Treng Provincial Administration, 2021).

2.2. Data Collection

The data was collected from a total of nine fishers residing in six different villages, as mentioned previously. Specifically, there were two fishers from each of the villages Kang Speu, Koah Snaeng, and Krabei Chrum. Additionally, one fisher was selected from each of the villages Samkhouy, Sdao 1, and Srae Sranok. This sampling strategy ensured representation from a diverse range of villages and allowed for a comprehensive analysis of fishing practices and fish data across the study area.

2.3. Data Analysis

Excel was utilized to analyze the fish data. The data format was carefully designed, and the collected fish data was entered into the Excel program. Subsequently, various analyses were performed on the data, including examination of fishing gear, fishing hours, fish catch (in grams), relative abundance, and CPUE (Catch Per Unit Effort). By leveraging the capabilities of Excel, researchers were able to efficiently process and interpret the fish data, extracting valuable insights related to fishing patterns, catch rates, and overall fish abundance.

3. RESEARCH RESULTS

The research findings focusing on Fish Catch and Effort are classified by villages: Kang Speu, Koah Snaeng, Krabei Chrum, Samkhouy, Sdao 1, and Srae Sranok. The fish catch and effort in each of the six villages consist of sub-categories including fishing gear model, total fishing hours, fish catch, relative abundance, CPUE, and CPUE by months.

3.1. Fish Catch and Effort in Kang Speu Village

3.1.1. Gillnet Unit in Kang Speu Village

In the research conducted in Kang Speu Village, gillnets were used fishing gear for data collection and analysis purposes. The researchers employed gillnets at both the control site and the project site to gather information. At the control site, gillnets with a length of 80 meters, a height of 1.50 meters, and a mesh size of 6 centimeters were utilized. Similarly, the project site also employed gillnets with the same measurements.

Table 2: Gillnet unit in Kang Speu Village

Site	Gillnets in Research		
	Length (m)	Hight (m)	Mesh (cm)
Control Site	80	1.50	6
Project Site	80	1.50	6

3.1.2. Fishing Hours in Each Month from Aug to Dec 2022

Table 3 provides information on the total fishing hours by month in Kang Speu Village from August to December 2022. The data is presented for both the control site (CS) and the project site (PS). In August, September, October, and November, both the control site and the project site recorded 26 fishing hours each, resulting in a total of 52 fishing hours for each of these months. This indicates consistent fishing activity at both sites during these months.

In December in 2022, however, the project site recorded 13 fishing hours while no fishing activity in control site in December, 2022. This suggests a decrease in fishing activity during this month compared to the previous months.

Table 3: Total Fish Hours by Months in Kang Speu Village

Total Fishing Hours by Months (Aug to Dec 2022)														
Aug			Sep			Oct			Nov			Dec		
CS	PS	Total	CS	PS	Total	CS	PS	Total	CS	PS	Total	CS	PS	Total
26	26	52	26	26	52	26	26	52	26	26	52		13	13
Note: CS= control site, PS= Project Site														

3.1.3. Fish Catch, Relative Abundance and CPUE in Aug 2022 in Kang Speu Village

Table 4 provides information on fish catch, relative abundance, and CPUE (Catch Per Unit of Effort) in Kang Speu village for the month of August 2022.

In August 2022, the fish catch in Kang Speu village amounted to a total of 2004.70 grams. The catch included various fish species, with different volumes recorded for each species. Among them, the highest catch volume was for Sambork Sralao, with a total of 807.00 grams. This was followed by Chkaok with a catch volume of 372.30 grams, and ChraKeng with 315.30 grams. Domrey accounted for 227.80 grams of the catch, while Sraka Kdam had a catch volume of 206.00 grams. Kanchos Kdong had the lowest catch volume recorded, with 76.30 grams. These catch volumes provide insights into the fish diversity and abundance in Kang Speu village during August 2022.

In August 2022, the relative abundance of fish species in Kang Speu village can be determined based on the catch volumes provided. The total catch for all fish species combined is considered 100%. Among the recorded species, Chkaok represented approximately 19% of the total catch, ChraKeng accounted for around 16%, and Domrey made up about 11%. Kanchos Kdong had a relative abundance of approximately 4%, while Sambork Sralao was the most abundant species with a relative abundance of around 40%. Sraka Kdam had a relative abundance of about 10%. These relative abundances provide insights into the proportion of each fish species within the overall fish catch in Kang Speu village during August 2022.

The total CPUE for all fish species combined in Kang Speu village during August 2022 is 38.55 grams per hour. Among the recorded species, Chkaok had a CPUE of 7.16 grams per hour, ChraKeng had a CPUE of 6.06 grams per hour, and Domrey had a CPUE of 4.38 grams per hour. Kanchos Kdong had a CPUE of 1.47 grams per hour, while Sambork Sralao had the highest CPUE at 15.52 grams per hour. Sraka Kdam had a CPUE of 3.96 grams per hour.

In August 2022, the CPUE (Catch Per Unit of Effort) in Kang Speu village was measured at both the Control Site (CS) and the Project Site (PS). At the Control Site (CS), the CPUE was recorded at 50.34 grams per hour, indicating the amount of fish caught per hour of fishing effort at that specific location. On the other hand, at the Project Site (PS), the CPUE was at 26.76 grams per hours. Overall CPUE was 38.55 grams per hour.

Table 4: Fish Catch, Relative Abundance and CPEU in August 2022 in Kang Speu

Fish Species	Aug 2022								
	Fish Catch (g)			Relative Abundance			CPUE (g/h)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Chkaok	372.30		372.30	28%	28%	19%	14.32	0.00	7.16
ChraKeng	210.20	105.10	315.30	16%	16%	16%	8.08	4.04	6.06
Domrey	227.80		227.80	17%	17%	11%	8.76	0.00	4.38
Kanchos Kdong		76.30	76.30	0%	0%	4%	0.00	2.93	1.47
Sambork Sralao	345.60	461.40	807.00	26%	26%	40%	13.29	17.75	15.52
Sraka Kdam	153.00	53.00	206.00	12%	12%	10%	5.88	2.04	3.96
Total	1308.90	695.80	2004.70	100%	100%	100%	50.34	26.76	38.55

3.1.4. Fish Catch, Relative Abundance and CPUE in Sep 2022 in Kang Speu Village

In September 2022, the fish catch in Kang Speu village can be analyzed based on the recorded volumes for each fish species. The total fish catch for all species combined in the village during that month was 2419.70 grams.

Among the recorded species, Chpin had a fish catch volume of 626.10 grams, ChraKeng accounted for 419.10 grams, and Chveat made up 137.90 grams of the total catch. Kahaer Leung had a catch volume of 93.50 grams, while Kanchos Kdong had 76.30 grams. Sambork Sralao was the most abundant species with a catch volume of 781.60 grams, and Sraka Kdam had a catch volume of 285.20 grams.

In August 2022, the relative abundance of different fish species in Kang Speu village can be determined based on the provided data. The total relative abundance for all fish species combined in the village during that month is 100%.

Among the recorded species, Chpin has a relative abundance of 26%, ChraKeng accounts for 17%, and Chveat makes up 6% of the total relative abundance. Kahaer Leung has a relative abundance of 4%, while Kanchos Kdong contributes 3%. Sambork Sralao is the most abundant species with a relative abundance of 32%, and Sraka Kdam has a relative abundance of 12%.

In September 2022, the CPUE (Catch Per Unit of Effort) in Kang Speu village can be analyzed based on the recorded CPUE values for each fish species. The total CPUE for all species combined in the village during that month was 46.53 grams per hour. Among the recorded species, Chpin had a CPUE of 12.04 grams per hour, ChraKeng had a CPUE of 8.06 grams per hour, and Chveat had a CPUE of 2.65 grams per hour. Kahaer Leung had a CPUE of 1.80 grams per hour, while Kanchos Kdong had a CPUE of 1.47 grams per hour. Sambork Sralao had the highest CPUE among the recorded species with 15.03 grams per hour, and Sraka Kdam had a CPUE of 5.48 grams per hour.

Table 5: Fish Catch, Relative Abundance and CPUE in Sep 2022 in Kang Speu Village

Fish Species	Sep 2022								
	Volum of Fish Catch (g)			Relative Abundance			CPUE (g/h/Gillet unit)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Chpin	94.30	531.80	626.10	13%	32%	26%	3.63	20.45	12.04
ChraKeng	419.10		419.10	57%	0%	17%	16.12	0.00	8.06
Chveat		137.90	137.90	0%	8%	6%	0.00	5.30	2.65
Kahaer Leung		93.50	93.50	0%	6%	4%	0.00	3.60	1.80
Kanchos Kdong	76.30		76.30	10%	0%	3%	2.93	0.00	1.47
Sambork Sralao		781.60	781.60	0%	46%	32%	0.00	30.06	15.03
Sraka Kdam	145.50	139.70	285.20	20%	8%	12%	5.60	5.37	5.48
Total	735.20	1684.50	2419.70	100%	100%	100%	28.28	64.79	46.53

3.1.5. Fish Catch, Relative Abundance and CPUE in Oct 2022 in Kang Speu Village

In October 2022, a total of 2170.70 grams of fish were caught in Kang Speu village. The fish catch was diverse, comprising various species. Among the catch, Chpin accounted for 188.50 grams. ChraKeng contributed significantly to the overall catch with 417.30 grams, while Kahaer made up 93.50 grams. Kol Prich was another notable species, contributing 340.50 grams to the total catch. The largest proportion of the fish catch came from Sraka Kdam, with a weight of 1130.90 grams. These figures provide insight into the variety and quantity of fish caught in Kang Speu village during October 2022.

In October 2022, the relative abundance of fish species in Kang Speu village varied, providing insights into the distribution and dominance of different species in the fishing activities during that month. Among the species, Chpin, ChraKeng, and Kahaer each had a relative abundance of 4%, indicating a relatively low contribution to the overall fish catch. Kol Prich, with a relative abundance of 16%, represented a slightly higher proportion of the catch. However, the majority of the fish catch in Kang Speu village during that time came from Sraka Kdam, which had a relative abundance of 52%. This suggests that Sraka Kdam was the most abundant and dominant species in the fishing activities, making up over half of the total catch.

In October 2022, in Kang Speu village, overall CPUE for that month was calculated at 41.74 grams per hour, reflecting the overall catch rate. Among the fish species, Chpin accounted for 3.62 grams per hour while ChraKeng had the CPUE of 1.81 grams per hour, indicating a relatively low catch rate for these species. Kahaer had a slightly higher CPUE of 1.80 grams per hour. Kol Prich showed a more productive catch rate with a CPUE of 6.55 grams per hour. However, the highest CPUE was observed for Sraka Kdam, with a value of 21.75 grams per hour, suggesting a higher catch rate and productivity for this species.

Table 6: Fish Catch, Abundance and CPUE in Oct 2022 in Kang Speu

Fish Species	Oct 2022								
	Volum of Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Chpin	188.50		188.50	24%	0%	8%	7.25	0.00	3.62
ChraKeng	93.50		93.50	12%	0%	4%	3.60	0.00	1.80
Kahaer		340.50	340.50	0%	25%	16%	0.00	13.10	6.55
Kol Prich	145.50	985.40	1130.90	19%	71%	52%	5.60	37.90	21.75
Sraka Kdam	785.70	1385	2170.70	100%	100%	100%	30.22	53.27	41.74
Total	785.70	1385.00	2170.70	100%	100%	100%	30.22	53.27	41.74

3.1.6. Fish Cach, Relative Abundance and CPUE in Nov 2022 in Kang Speu Village

In September 2022, the fish catch in Kang Speu village was measured in grams, with a total volume of 2123.10 grams. Among the fish species, Chpin had the highest fish catch volume, accounting for 1756 grams. This indicates that Chpin was the dominant species in the fishing activities during that month. Sraka Kdam Kahaer had a smaller catch volume of 211.10 grams, while Kahaer contributed even less to the overall catch with a volume of 156.00 grams.

In November 2022, the relative abundance of fish species in Kang Speu village varied. Chpin was the most abundant species, comprising 83% of the total fish catch. This suggests that Chpin was the dominant fish species during that month. Sraka Kdam had a relative abundance of 10%, indicating a similar. The remaining 7% represented Khaer fish species.

In November 2022, the overall CPUE in Kang Speu village was 40.83 grams per hour. CPUE in control site was 36.44 gram per hour while the CPUE in project site was 45.02 grams per hour.

Table 7: Fish Cach, Relative Abundance and CPUE in Nov 2022 in Kang Speu

Fish Species	Nov 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Chpin	741.6	1014.40	1756	78%	87%	83%	28.52	39.02	33.77
Kahaer		156.00	156.00	0%	13%	7%	0.00	6.00	3.00
Sraka Kdam	211.10		211.10	22%	0%	10%	8.12	0.00	4.06
Total	952.70	1170.40	2123.10	100%	100%	100%	36.64	45.02	40.83

3.1.7. Fish Cach, Relative Abundance and CPUE in Dec 2022 in Kang Speu Village

In December 2022, the fish catch in Kang Speu village was measured in grams. The data provided includes catch volumes for three fish species: Chpin, Kahaer, and Sraka Kdam. The total fish catch for all species combined was 1501.60 grams. Among the individual species, Chpin had the highest catch volume of 856.50 grams, indicating it was a significant contributor to the overall fish catch

in Kang Speu village during that month. Kahaer had a catch volume of 78.00 grams, suggesting it made a smaller but still present contribution. Sraka Kdam had a catch volume of 567.10 grams, indicating its presence in the overall fish catch as well.

In December 2022, the relative abundance of fish species in Kang Speu village was measured. The data provided includes the relative abundance percentages for three fish species: Chpin, Kahaer, and Sraka Kdam. The relative abundance of all fish species combined is 100%. Among the individual species, Chpin has a relative abundance of 57%, indicating that it was the most abundant fish species during that month in Kang Speu village. Kahaer has a relative abundance of 5%, suggesting it was less abundant compared to Chpin. Sraka Kdam has a relative abundance of 38%, indicating it was also present but less abundant compared to Chpin.

In December 2022, the Catch Per Unit Effort (CPUE) data for fish species in Kang Speu village revealed valuable insights into the productivity and abundance of the fishery. The overall CPUE for all species combined was 115.51 grams per hour, indicating a relatively productive fishing effort. Among the individual species, Chpin had the highest CPUE of 65.88 grams per hour, suggesting it was the most abundant and targeted species during that period. Kahaer had a lower CPUE of 6.00 grams per hour, indicating a lesser catch rate compared to Chpin. Sraka Kdam had a CPUE of 43.62 grams per hour, suggesting moderate abundance and catch rate.

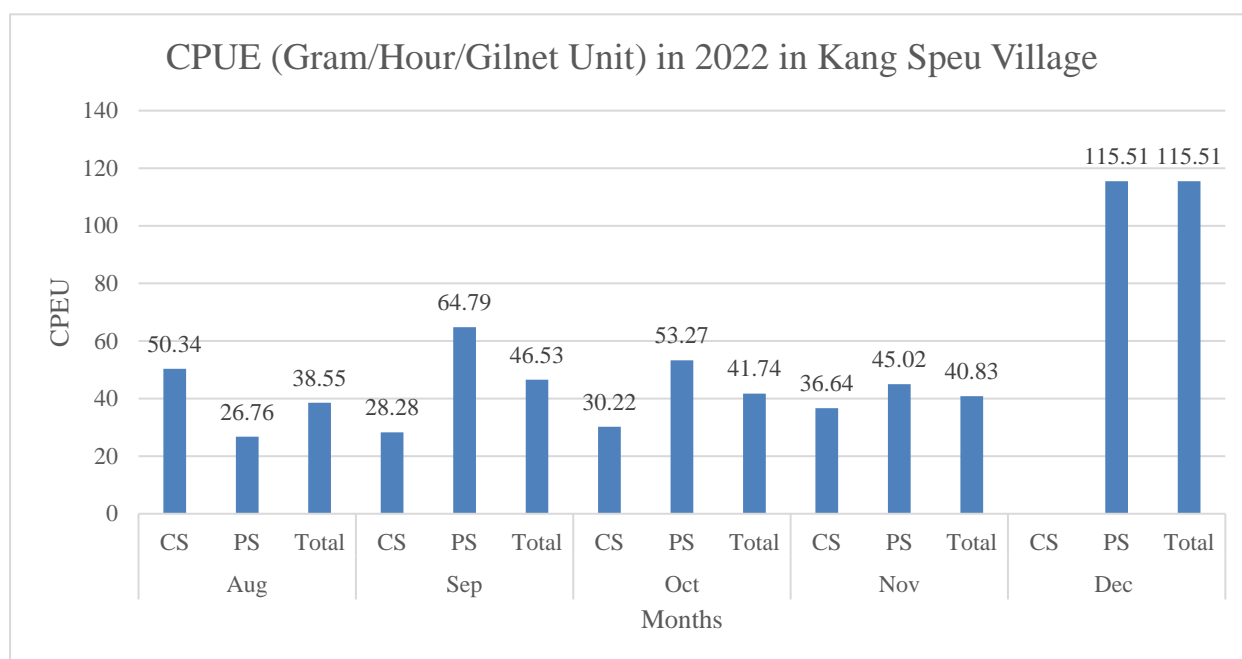
Table 8: Fish Catch, Relative Abundance and CPUE in Dec 2022 in Kang Speu

Fish Species	Dec 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Chpin		856.50	856.50		57%	57%		65.88	65.88
Kahaer		78.00	78.00		5%	5%		6.00	6.00
Sraka Kdam		567.10	567.10		38%	38%		43.62	43.62
Total		1501.60	1501.60		100%	100%		115.51	115.51

3.1.8. CPUE by Month 2022 in Kang Speu Village

In Kang Speu in 2022, the CPUE (Catch Per Unit Effort) values were monitored in the project site and control site during the months of August, September, and October 2022. The CPUE in the control site ranged from 50.34 in August to 30.22 in October 2022, indicating varying levels of fishing productivity. Similarly, the CPUE in the project site ranged from 26.76 in August to 53.27 in October 2022. The CPUE, combining both sites, ranged from 38.55 in August to 41.74 in October in 2022.

Figure 1: CPUE by Month 2022 in Kang Speu Village



3.2. Fish Catch, Relative Abundance and CPUE in Kaoh Snaeng Village

3.2.1. Gillnet Model in Koah Snaeng Village

The research conducted in Koah Snaeng Village involved the use of gillnets as fishing gears. Table provides detailed information about the characteristics of these gillnets at both the Control Site and the Project Site.

The gillnets used at both sites had a length of 100 meters. In terms of height, the gillnets at both the Control Site and the Project Site measured 1.50 meters. The mesh size of the gillnets was slightly different between the two sites. At the Control Site, the gillnets had a mesh size of 3.21 centimeters, while at the Project Site, the mesh size was slightly smaller at 3.14 centimeters.

Table 9: Fishing Gears in research in Koah Snaeng Village

Site	Gillnets in Research		
	Length (m)	Hight (m)	Mesh (cm)
Control Site	100.	1.50	3.21
Project Site	100	1.50	3.14

3.2.2. Fishing Hours in Koah Snaeng Village

The total fishing hours by months in the research conducted in Koah Snaeng Village are presented in Table 10. The table provides information on the cumulative fishing hours for each month at both the Control Site (CS) and the Project Site (PS).

According to the data, the total fishing hours were consistently 58 hours for each month from May to December 2022. This indicates that the researchers spent the same amount of time fishing each

month throughout the study period. At both the Control Site and the Project Site, the total fishing hours were evenly distributed, with 30 hours allocated to control site and 28 hours allocated project site for each month. Overall, the total fishing hours by months in the research in Koah Snaeng Village were consistent at 58 hours per month, with an even distribution of hours between the Control Site and the Project Site.

Table 10: Total Fish Hours by Months in Koah Snaeng Villag

Total Fishing Hours by Months in 2022													
May		Jul		Aug		Sep		Oct		Nov		Dec	
58		58		58		58		58		58		58	
CS	PS	CS	PS	CS	PS	CS	PS	CS	PS	CS	PS	CS	PS
30	28	30	28	30	28	30	28	30	28	30	28	28	30
Note: CS= control site, PS= Project Site													

3.2.3. Fish Catch, Relative Abundance and CPUE in May 2022 in Kaoh Snaeng

In May 2022, the fish catch in Kaoh Snaeng village consisted of various fish species. The total volume of fish catch for all species combined was 1633 grams. Among the individual species, Chhveat Sderng had a catch volume of 326 grams, Chpin Muol had a catch volume of 215 grams, Chpin Sambet had a catch volume of 353 grams, ChraKeng had a catch volume of 64 grams, Khnong Bornla had a catch volume of 37 grams, Kochos Para had a catch volume of 38 grams, Prama had a catch volume of 35 grams, Riel had a catch volume of 485 grams, and Trasak had a catch volume of 80 grams.

In May 2022, the relative abundance of fish species in Kaoh Snaeng village can be analyzed based on the provided data. The relative abundance represents the proportion of each fish species within the total fish catch. Among all the fish species combined, Chhveat Sderng had the highest relative abundance, accounting for 20% of the total fish catch. Chpin Muol followed with a relative abundance of 13%, while Chpin Sambet had a relative abundance of 22%. Trasak had relative abundance of 5% while ChraKeng had a relative abundance of 4%, Khnong Bornla, Kochos Para and Prama each had a relative abundance of 2%. Riel had the highest relative abundance among the individual fish species, accounting for 30% of the total fish catch.

The CPUE for all fish species combined was 28.16 grams per hour per Gillnet Unit. Among the individual fish species, Chhveat Sderng had a CPUE of 5.62 grams per hour per Gillnet Unit, Chpin Muol had a CPUE of 3.71 grams per hour per Gillnet Unit, and Chpin Sambet had a CPUE of 6.09 grams per hour per Gillnet Unit.

ChraKeng had a CPUE of 1.10 grams per hour per Gillnet Unit, Khnong Bornla had a CPUE of 0.64 grams per hour per Gillnet Unit, and Kochos Para had a CPUE of 0.66 grams per hour per

Gillnet Unit. Prama had a CPUE of 0.60 grams per hour per Gillnet Unit, Riel had a CPUE of 8.36 grams per hour per Gillnet Unit, and Trasak had a CPUE of 1.38 grams per hour per Gillnet Unit.

Table 11: Fish Catch, Relative Abundance and CPUE in May 2022 in Kaoh Snaeng

Fish Species	May 2022								
	Fish Catch			Relative Abundance			CPUE (grams/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Chhveat Sderng	326		326	26%	0%	20%	10.87	0.00	5.62
Chpin Muol	215		215	17%	0%	13%	7.17	0.00	3.71
Chpin sambet	335	18	353	27%	5%	22%	11.17	0.64	6.09
ChraKeng		64	64	0%	17%	4%	0.00	2.29	1.10
Khong bornla		37	37	0%	10%	2%	0.00	1.32	0.64
Kochos para	38		38	3%	0%	2%	1.27	0.00	0.66
Prama		35	35	0%	9%	2%	0.00	1.25	0.60
Riel	333	152	485	27%	39%	30%	11.10	5.43	8.36
Trasak		80	80	0%	21%	5%	0.00	2.86	1.38
Total	1247	386	1633	100%	100%	100%	41.57	13.79	28.16

3.2.4. Fish Catch, Relative Abundance and CPUE in Jul 2022 in Koah Snaeng

In July 2022, the fish catch in Koah Snaeng Village consisted of various fish species. The total volume of fish catch for all species combined was 837 grams. Among the individual species, Ach Kok had a catch volume of 65 grams, Chhkaok Kdar had a catch volume of 35 grams, Chhveat had a catch volume of 15 grams, Chkok Muol had a catch volume of 47 grams, Chpin Muol had a catch volume of 41 grams, ChraKeng had a catch volume of 244 grams, Kahaer had a catch volume of 16 grams, Kantrob had a catch volume of 75 grams, Khong Bornla had a catch volume of 62 grams, Kochos Para had a catch volume of 18 grams, Kom Bot Chromos had a catch volume of 16 grams, Pkar Kor had a catch volume of 66 grams, Riel had a catch volume of 54 grams, Ros had a catch volume of 70 grams, and Slab Mann had a catch volume of 13 grams.

In July 2022, the relative abundance of fish species in Kaoh Snaeng Village can be analyzed. The relative abundance represents the proportion of each fish species within the total fish catch. Among all the fish species combined, ChraKeng had the highest relative abundance, accounting for 29% of the total fish catch. The next most abundant species were Riel and Ros, each accounting for 8% of the total fish catch. Chpin Muol had a relative abundance of 6%, while Ach Kok and Khong Bornla each had a relative abundance of 8%. Chhveat, Chkok Muol, and Kochos Para each had a relative abundance of 2%, while Chhkaok Kdar, Kahaer, Kantrob, Kom Bot Chromos, Pkar Kor, and Slab Mann each had a relative abundance ranging from 2% to 7%.

The CPUE for all fish species combined was 14.43 grams per hour. Among the individual fish species, Ach Kok had a CPUE of 1.12 grams per hour, Chhkaok Kdar had a CPUE of 0.60 grams

per hour, Chhveat had a CPUE of 0.26 grams per hour, Chkok Muol had a CPUE of 0.81 grams per hour, and Chpin Muol had a CPUE of 0.71 grams per hour.

ChraKeng had a CPUE of 4.21 grams per hour, Kahaer had a CPUE of 0.28 grams per hour, Kantrob had a CPUE of 1.29 grams per hour, Khnong Bornla had a CPUE of 1.07 grams per hour, and Kochos Para had a CPUE of 0.31 grams per hour. Kom Bot Chromos had a CPUE of 0.28 grams per hour, Pkar Kor had a CPUE of 1.14 grams per hour, Riel had a CPUE of 0.93 grams per hour, Ros had a CPUE of 1.21 grams per hour, and Slab Mann had a CPUE of 0.22 grams per hour.

Table 12: Fish Catch, Relative Abundance and CPUE in Jul 2022 in Koah Snaeng

Fish Species	Jul 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Ach Kok		65	65	0%	22%	8%	0.00	2.32	1.12
Chhkaok kdar		35	35	0%	12%	4%	0.00	1.25	0.60
Chhveat	15		15	3%	0%	2%	0.50	0.00	0.26
Chkok Muol	47		47	9%	0%	6%	1.57	0.00	0.81
Chpin Muol	41		41	8%	0%	5%	1.37	0.00	0.71
ChraKeng	142	102	244	26%	35%	29%	4.73	3.64	4.21
Kahaer		16	16	0%	5%	2%	0.00	0.57	0.28
Kantrob	75		75	14%	0%	9%	2.50	0.00	1.29
Khnong bornla	34	28	62	6%	10%	7%	1.13	1.00	1.07
Kochos para		18	18	0%	6%	2%	0.00	0.64	0.31
Kom bot chromos	16		16	3%	0%	2%	0.53	0.00	0.28
Pkar Kor	66		66	12%	0%	8%	2.20	0.00	1.14
Riel	26	28	54	5%	10%	6%	0.87	1.00	0.93
Ros	70		70	13%	0%	8%	2.33	0.00	1.21
Slab Mann	13		13	2%	0%	2%	0.43	0.00	0.22
Total	545	292	837	100%	100%	100%	18.17	10.43	14.43

3.2.5. Fish Catch, Relative Abundance and CPUE in Sep 2022 in Koah Snaeng

The total volume of fish catch for all species combined was 1341 grams. Among the individual fish species, Ach Kok had a catch volume of 170 grams, Chpin Meas had a catch volume of 70 grams, Chpin Muol had a catch volume of 738 grams, ChraKeng had a catch volume of 235 grams, Kom bot chromos had a catch volume of 27 grams, Kontrop had a catch volume of 69 grams, and Riel had a catch volume of 32 grams.

Among all the fish species combined, Chpin Muol had the highest relative abundance, accounting for 55% of the total fish catch. The next most abundant species were ChraKeng, accounting for 18% of the total fish catch, and Ach Kok, accounting for 13% of the total fish catch. Chpin Meas

and Kantrop had a relative abundance of 5%, while Kom bot chromos, and Riel each had a relative abundance of 2%.

The CPUE for all fish species combined was 23.12 grams per hour per Gillnet Unit. Among the individual fish species, Ach Kok had a CPUE of 2.93 grams per hour per Gillnet Unit, Chpin Meas had a CPUE of 1.21 grams per hour per Gillnet Unit, Chpin Muol had a CPUE of 12.72 grams per hour per Gillnet Unit, ChraKeng had a CPUE of 4.05 grams per hour per Gillnet Unit, Kom bot chromos had a CPUE of 0.47 grams per hour per Gillnet Unit, Kontrop had a CPUE of 1.19 grams per hour per Gillnet Unit, and Riel had a CPUE of 0.55 grams per hour per Gillnet Unit.

Table 13: Fish Catch, Relative Abundance and CPUE in Sep 2022 in Koah Snaeng

Fish Species	Sep 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Ach Kok	80	90	170	9%	22%	13%	2.67	3.21	2.93
Chpin Meas	24	46	70	3%	11%	5%	0.80	1.64	1.21
Chpin Muol	738		738	79%	0%	55%	24.60	0.00	12.72
ChraKeng	68	167	235	7%	41%	18%	2.27	5.96	4.05
Kom bot chromos	27		27	3%	0%	2%	0.90	0.00	0.47
Kontrop		69	69	0%	17%	5%	0.00	2.46	1.19
Riel		32	32	0%	8%	2%	0.00	1.14	0.55
Total	937	404	1341	100%	100%	100%	31.23	14.43	23.12

3.2.6. Fish Catch, Relative Abundance and CPUE in Oct 2022 in Koah Snaeng

The total volume of fish catch for all species combined was 1791.1 grams. Among the individual fish species, Chpin Meas had a catch volume of 1285.5 grams, Chlang had a catch volume of 40.2 grams, ChraKeng had a catch volume of 34.6 grams, Kes had a catch volume of 44.2 grams, Chpin Prak had a catch volume of 114 grams, Chpin sambet had a catch volume of 34.6 grams, Ach Kok had a catch volume of 83 grams, Khnong bornla had a catch volume of 32.5 grams, Chveat had a catch volume of 26 grams, and Kambot Chramos had a catch volume of 100.04 grams.

In October 2022, the relative abundance of fish species in Koah Snaeng village can be determined. The relative abundance represents the proportion of each fish species within the total fish catch. Among all the fish species combined, Chpin Meas had the highest relative abundance, accounting for 72% of the total fish catch, Chpin Prak, accounting for 6% of the total fish catch. Ach Kok had a relative abundance of 5%, while Chlang, ChraKeng, Chpin sambet, Chveat, Khnong bornla, and Kambot Chramos each had a relative abundance of 2%.

The CPUE for all fish species combined was 30.88 grams per hour per Gillnet Unit. Among the individual fish species, Chpin Meas had a CPUE of 22.16 grams per hour per Gillnet Unit, Ach Kok had a CPUE of 1.43 grams per hour per Gillnet Unit, Kes had a CPUE of 0.76 grams per hour

per Gillnet Unit, Chpin Prak had a CPUE of 1.97 grams per hour per Gillnet Unit, ChraKeng had a CPUE of 0.53 grams per hour per Gillnet Unit, Chpin sambet had a CPUE of 0.60 grams per hour per Gillnet Unit, Chveat had a CPUE of 0.45 grams per hour per Gillnet Unit, Khnong bornla had a CPUE of 0.56 grams per hour per Gillnet Unit, Kambot Chramos had a CPUE of 1.73 grams per hour per Gillnet Unit, and Chlang had a CPUE of 0.69 grams per hour per Gillnet Unit.

Table 14: Fish Catch, Relative Abundance and CPUE in Oct 2022 in Koah Snaeng

Fish Species	Oct 2022								
	Fish Catch (g)			Relative Abundance			CPUE		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Ach Kok	83		83	18%	0%	5%	2.77	0.00	1.43
Chlang	40.2		40.2	9%	0%	2%	1.34	0.00	0.69
Chpin Meas	30.5	1255	1285.5	7%	95%	72%	1.02	44.82	22.16
Chpin Prak	114		114	24%	0%	6%	3.80	0.00	1.97
Chpin sambet		34.6	34.6	0%	3%	2%	0.00	1.24	0.60
ChraKeng	30.7		30.7	7%	0%	2%	1.02	0.00	0.53
Chveat	26		26	6%	0%	1%	0.87	0.00	0.45
Kambot Chramos	100.4		100.4	21%	0%	6%	3.35	0.00	1.73
Kes	44.2		44.2	9%	0%	2%	1.47	0.00	0.76
Khnong bornla		32.5	32.5	0%	2%	2%	0.00	1.16	0.56
Total	469	1322.1	1791.1	100%	100%	100%	15.63	47.22	30.88

3.2.7. Fish Catch, Relative Abundance and CPUE in Nov 2022 in Koah Snaeng

In November 2022, the fish catch in Koah Snaeng village can be analyzed. The total volume of fish catch for all species combined was 856 grams. Among the individual fish species, ChraKeng had the highest catch volume with 476 grams, followed by Chpin Sderng with 114 grams, Chamnang KoKi with 41 grams, and Kdam was 208 grams. Chveat catch was 17 grams.

In November 2022, the relative abundance of fish species in Koah Snaeng village varied, with ChraKeng being the most abundant at 56%, followed by Kdam at 24%, Chpin Sderng at 13%, Chamnang KoKi at 5%, and Chveat at 2%. These relative abundance percentages provide insights into the distribution and prevalence of different fish species during that month. The dominance of ChraKeng suggests it was the most common species in the fish catch, while the lower percentages for the other species indicate their lesser presence.

In November 2022, the fish catch in Koah Snaeng village was analyzed based on the Catch Per Unit Effort (CPUE) data. The CPUE for all fish species combined was 14.76 grams per hour, with ChraKeng having the highest CPUE at 8.21 grams per hour. This indicates that ChraKeng was the most abundant species during the fishing activities in that month. Kdam had a CPUE of 3.59 grams per hour, Chpin Sderng had a CPUE of 1.97 grams per hour, Chamnang KoKi had a CPUE of 0.71 grams per hour, and Chveat had the lowest CPUE at 0.29 grams per hour.

Table 15: Fish Catch, Relative Abundance and CPUE in Nov 2022 in Kaoh Snaeng

Fish Species	Nov 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Chamnang KoKi	41		41	9%	0%	5%	1.37	0.00	0.71
Chpin Sderng	99	15	114	22%	4%	13%	3.30	0.54	1.97
ChraKeng	207	269	476	46%	67%	56%	6.90	9.61	8.21
Chveat	17		17	4%	0%	2%	0.57	0.00	0.29
Kdam	90	118	208	20%	29%	24%	3.00	4.21	3.59
Total	454	402	856	100%	100%	100%	15.13	14.36	14.76

3.2.8. Fish Catch, Relative Abundance and CPUE in Aug 2022 in Kaoh Snaeng

The total volume of fish catch for all species combined was 954 grams. Among the individual fish species, Ach Kok had a catch volume of 114 grams, Chek Tum had a catch volume of 42 grams, Chhkaok Kdar had a catch volume of 32 grams, Chveat had a catch volume of 54 grams, Chpin Meas had a catch volume of 51 grams, Chpin Muol had a catch volume of 63 grams, Chpin Sambet had a catch volume of 30 grams, ChraKeng had a catch volume of 145 grams, Dom Rey had a catch volume of 97 grams, Kahaer had a catch volume of 36 grams, Khnong Bornla had a catch volume of 72 grams, LoLok Sor had a catch volume of 99 grams, Riel had a catch volume of 94 grams, and Sleuk Russey had a catch volume of 25 grams.

In August 2022, the relative abundance of fish species in Koah Snaeng village can be determined. The relative abundance represents the proportion of each fish species within the total fish catch. Among all the fish species combined, ChraKeng had the highest relative abundance, accounting for 15% of the total fish catch. Ach Kok had a relative abundance of 12%. The next most abundant species were Chpin Meas, Chpin Muol, Dom Rey, Chek Tum, Chhkaok Kdar, Sleuk Russey, Chveat, Kahaer, LoLok Sor, Khnong Bornla, Riel and Chpin Sambet ranged from 2% to 10% of the total fish catch.

The CPUE for all fish species combined was 16.45 grams per hour. Among the individual fish species, Ach Kok had a CPUE of 1.97 grams per hour, Chek Tum had a CPUE of 0.72 grams per hour, Chhkaok Kdar had a CPUE of 0.55 grams per hour, Chveat had a CPUE of 0.93 grams per hour, Chpin Meas had a CPUE of 0.88 grams per hour, Chpin Muol had a CPUE of 1.09 grams per hour, Chpin Sambet had a CPUE of 0.52 grams per hour, and ChraKeng had a CPUE of 2.50 grams per hour. Dom Rey had a CPUE of 1.67 grams per hour, Kahaer had a CPUE of 0.62 grams per hour, Khnong Bornla had a CPUE of 1.24 grams per hour, LoLok Sor had a CPUE of 1.71 grams per hour, Riel had a CPUE of 1.62 grams per hour, and Sleuk Russey had a CPUE of 0.43 grams per hour.

Table 16: Fish Catch, Relative Abundance and CPUE in Aug 2022 in Koah Snaeng

Fish Species	Aug 2022								
	Fish Catch (g)			Relative Abundance			CPUE		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Ach Kok	79	35	114	14%	9%	12%	2.63	1.25	1.97
Chek Tum		42	42	0%	11%	4%	0.00	1.50	0.72
Chhkaok kdar		32	32	0%	9%	3%	0.00	1.14	0.55
Chpin Meas	51		51	9%	0%	5%	1.70	0.00	0.88
Chpin Muol	63		63	11%	0%	7%	2.10	0.00	1.09
Chpin sambet		30	30	0%	8%	3%	0.00	1.07	0.52
ChraKeng	85	60	145	15%	16%	15%	2.83	2.14	2.50
Chveat	22	32	54	4%	9%	5%	0.77	1.14	0.93
Dom rey	97		97	17%	0%	10%	3.23	0.00	1.67
Kahaer	36		36	6%	0%	4%	1.20	0.00	0.62
Khong bornla	48	24	72	8%	6%	8%	1.60	0.86	1.24
LoLok sor	24	75	99	4%	20%	10%	0.80	2.68	1.71
Riel	48	46	94	8%	12%	10%	1.60	1.64	1.62
Sleuk Russey	25		25	4%	0%	3%	0.83	0.00	0.43
Total	578	376	954	100%	100%	100%	19.27	13.43	16.45

3.2.9. Fish Catch, Relative Abundance and CPUE in Dec 2022 in Koah Snaeng

In December 2022, the fish catch in Koah Snaeng village was analyzed based on the volume of fish caught (in grams) for each species. The total volume of fish caught for all species combined was 564 grams. Among the individual species, Chpin Sderng had the highest catch volume at 95 grams, followed by Chpin with 94 grams. Other notable catches included Ach Kok with 66 grams, Kmann with 64 grams, and Kambot Chramos with 90 grams.

In December 2022, the relative abundance of fish species in Koah Snaeng village was analyzed based on the provided data. The relative abundance represents the proportion of each species within the total fish catch. Among the species, Chpin and Chpin Sderng had the highest relative abundances at 17% each, indicating their significant presence in the catch. Ach Kok and Kambot Chramos followed with relative abundances of 12% and 16% respectively. Other species such as Kmann, Chhlonh, and Chveat also contributed to the catch with relative abundances of 11%, 8%, and 7% respectively.

In December 2022, the Catch Per Unit Effort (CPUE) was analyzed in Koah Snaeng Village. The CPUE represents the amount of fish caught per unit of fishing effort, measured in grams per hour. Overall CPUE was 9.72 grams per hour. Among the species, Chpin Sderng had the highest CPUE at 1.64 grams per hour, followed closely by Chpin with a CPUE of 1.62 grams per hour. Other notable CPUE values included Ach Kok with 1.14 grams per hour and Kambot Chramos with 1.55 grams per hour.

Table 17: Fish Catch, Relative Abundance and CPUE in Dec 2022 in Kaoh Snaeng

Fish Species	Dec 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Ach Kok	33	33	66	10%	14%	12%	1.10	1.18	1.14
chhlonh	46		46	14%	0%	8%	1.53	0.00	0.79
Chpin		94	94	0%	40%	17%	0.00	3.36	1.62
Chpin Sderng	95		95	29%	0%	17%	3.17	0.00	1.64
Chveat	21	20	41	6%	8%	7%	0.70	0.71	0.71
Kahaer	11	11	22	3%	5%	4%	0.37	0.39	0.38
Kambot Chramos	90		90	27%	0%	16%	3.00	0.00	1.55
Kdam		18	18	0%	8%	3%	0.00	0.64	0.31
Kmann	32	32	64	10%	14%	11%	1.07	1.14	1.10
Omperl tom		13	13	0%	6%	2%	0.00	0.46	0.22
Sleuk Russey		15	15	0%	6%	3%	0.00	0.54	0.26
Total	328	236	564	100%	100%	100%	10.93	8.43	9.72

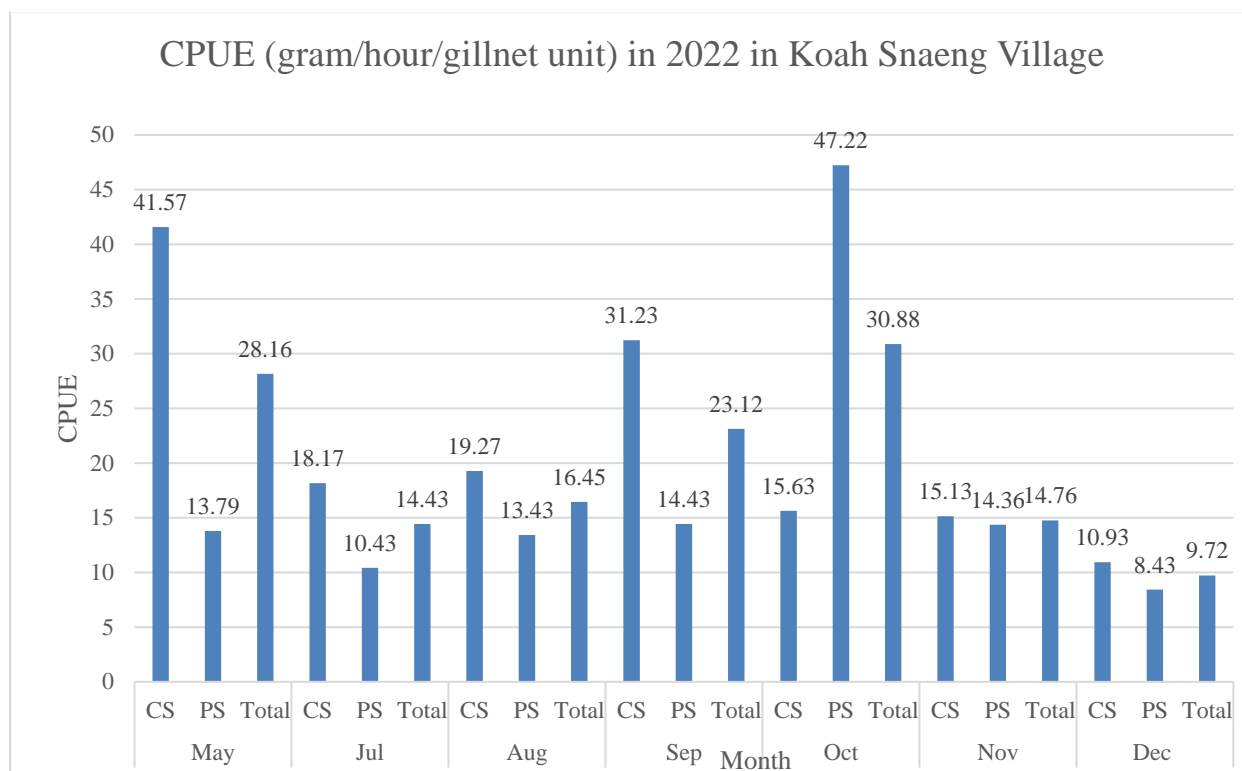
3.2.10. CPUE by Months, 2022 in Koah Snaeng

In Koah Snaeng, the CPUE (Catch Per Unit Effort) values were monitored in both the project site (PS) and control site (CS) during the months of May, July, August, September, October, November, and December.

In May, the CPUE in the project site was 13.79, while in the control site it was 41.57. The total CPUE for both sites combined was 28.16. In July, the CPUE in the project site was 10.43, while in the control site it was 18.17. The total CPUE for both sites combined was 14.43. In August, the CPUE in the project site was 13.43, while in the control site it was 19.27. The total CPUE for both sites combined was 16.45. In September, the CPUE in the project site was 14.43, while in the control site it was 31.23. The total CPUE for both sites combined was 23.12.

In October 2022, the CPUE in the project site was 47.22, while in the control site it was 15.63. The total CPUE for both sites combined was 30.88. In November 2022, the CPUE in the control site was 15.13, while in the project site it was 14.36. The total CPUE for both sites combined was 14.76. In December 2022, the CPUE in the control site was 10.93, while in the project site it was 8.43. The total CPUE for both sites combined was 9.72.

Figure 2: CPUE by Months, 2022 in Koah Snaeng



3.3. Fish Catch, Relative Abundance and CPUE in Krabei Chrum Village

3.3.1. Fishing Gears in Research Model in Krabei Chrum Village

In the research model conducted in Krabei Chrum village, gillnets were used. At the control site, gillnets with specific dimensions were employed. The length of the gillnet used was 40.00 meters. The height of the gillnet was 3.50 meters. The mesh size used in the gillnet was 4.00 centimeters. The gillnet used at the project site had a length of 27.27 meters. The height of the gillnet at the project site was 3.64 meters. The mesh size used in the project site's gillnet was 5.91 centimeters.

Table 18: Fishing Gears in Krabei Chrum Village

Site	Gillnets in Research		
	Length (m)	Hight (m)	Mesh (cm)
Control Site	40.00	3.50	4.00
Project Site	27.27	3.64	5.91

3.3.2. Fishing Hours in Krabei Chrum Village

In Krabei Chrum in 2022, the total fishing hours varied by month at both the control site (CS) and the project site (PS). In May, there were 26 hours of fishing at the control site, while no fishing activity in the project site. In July 2022, there were 13 hours of fishing at the control site, but in the project site, there was 26 hours of fishing. In August and September 2022, both the control site

and the project site had 26 hours of fishing each. In November 2022, the control site had 30 hours of fishing, while the project site had slightly less with 28 hours. Lastly, in December 2022, both sites had 56 hours of fishing.

Table 19: Total Fishing Hours by Months in Krabei Chrum in 2022

Total Fishing Hours by Months in 2022											
May		Jul		Aug		Sep		Nov		Dec	
CS	PS	CS	PS	CS	PS	CS	PS	CS	PS	CS	PS
26		13	26	26	26	26	26	30	28	28	28

Note: CS= control site, PS= Project Site

3.3.3. Fish Catch, Abundance and CPUE in May 2022 in Krabei Chrum

a. Control Sites

In May, data was collected in Krabei Chrum to assess the fish catch, relative abundance, and CPUE (Catch Per Unit Effort). The data for the different metrics are as follows:

Fish Catch: The total volume of fish caught at the control site (CS) in May was recorded as 1264 grams. This represents the combined weight of all fish species caught during that period.

Relative Abundance: The relative abundance of fish species at the control site (CS) in May was determined. The data shows that Chlat had a relative abundance of 28%, ChraKeng had a relative abundance of 7%, Kom Pleanh had a relative abundance of 13%, and No Nong Lving had a relative abundance of 51%.

CPUE: The CPUE was measured to determine the productivity of fishing efforts at the control site (CS) in Krabei Chrum. The CPUE for all fish species combined was recorded as 48.62 grams per hour. This indicates the average amount of fish caught per hour of fishing effort at the control site. Additionally, the CPUE for each individual fish species was recorded, with Chlat, ChraKeng, Kom Pleanh, and No Nong Lving having CPUE values of 13.62, 3.58, 6.46, and 24.96 grams per hour respectively.

Table 20: Fish Catch, Abundance and CPUE in Control Site in May 2022 in Krabei Chrum

Fish Species	May 2022		
	Fish Catch (g)	Relative Abundance	CPUE (gram/hour)
	CS	CS	CS
Chlat	354	28%	13.62
ChraKeng	93	7%	3.58
Kom Pleanh	168	13%	6.46
No Nong Lving	649	51%	24.96
Total	1264	100%	48.62

3.3.4. Fish Catch, Abundance and CPUE in Jul 2022 in Krabei Chrum

a. Control Site

In the control site of Krabei Chrum in July 2022, the fish catch survey recorded a total catch of 378 grams. This catch represents the combined weight of all fish species caught during the specified time period. The relative abundance of fish species in the control site varied. Among the observed species, Chkok Muol had a relative abundance of 36%, ChraKeng accounted for 33%, and Ling represented 31% of the total fish catch. The CPUE values in the control site in July 2022 ranged from 8.92 grams per hour to 10.46 grams per hour for different fish species. The CPUE combined all fish species is 29.08 grams per hour.

Table 21: Fish Catch, Abundance and CPUE in Control Site in Jul 2022 in Krabei Chrum

Fish Species	Jul 2022		
	Fish Catch (g)	Relative Abundance	CPUE (gram/hour)
Chkok Muol	136	36%	10.46
ChraKeng	126	33%	9.69
Ling	116	31%	8.92
Total	378	100%	29.08

b. Project Site

In the project site of Krabei Chrum in July 2022, the fish catch survey recorded a total catch of 291 grams. This catch represents the combined weight of all fish species caught during the specified time period. The relative abundance of fish species in the project site varied. Among the observed species, ChraKeng had a relative abundance of 57%, Kontrob accounted for 15%, Kranh represented 11%, and No Nong Lving accounted for 16% of the total fish catch. The CPUE values in the project site in July 2022 ranged from 1.27 grams per hour to 6.42 grams per hour for different fish species. The CPUE combined all fish species is 11.19 gram per hour.

Table 22: Fish Catch, Abundance and CPUE in Project Site in Jul 2022 in Krabei Chrum

Fish Species	Jul 2022		
	Fish Catch (g)	Relative Abundance	CPUE (gram/hour)
	PS	PS	PS
ChraKeng	167	57%	6.42
Kontrob	45	15%	1.73
Kranh	33	11%	1.27
No Nong Lving	46	16%	1.77
Total	291	100%	11.19

3.3.5. Fish Catch, Abundance and CPUE in Aug 2022 in Krabei Chrum

a. Control Site

Fish catch is an important metric used to assess the overall productivity and health of a fishery. In the control site of Krabei Chrum in August 2022, a total of 378 grams of fish were caught. This catch represents the combined effort of fishing in the area during that time period.

Relative abundance is a measure of the proportion or percentage of each fish species within the total catch. In the control site, various fish species were observed, including Chlat, ChraKeng, Kahaer, Kanchrook Krahorm, Ling, No Nong Lving, and Palang Khon. Each species had a different level of relative abundance, ranging from 10% to 20%. CPUE, or Catch Per Unit Effort, is a measure of fishing productivity. It quantifies the amount of fish caught per unit of fishing effort, typically measured in grams per hour. In the control site, the CPUE values ranged from 1.92 grams/hour to 2.85 grams/hour for different fish species. The CPUE combined all fish species is 14.54 gram per hour.

Table 23: Fish Catch, Abundance and CPUE in Control Site in Aug 2022 in Krabei Chrum

Fish Species	Aug 2022		
	Fish Catch (g)	Relative Abundance	CPUE (gram/hour)
Chlat	68	18%	2.62
ChraKeng	74	20%	2.85
Kahaer	61	16%	2.35
Ling	68	18%	2.62
No Nong Lving	57	15%	2.19
Palang Khon	50	13%	1.92
Total	378	100%	14.54

b. Project Site

In the project site of Krabei Chrum in August 2022, the fish catch survey recorded a total catch of 434 grams. This catch represents the combined weight of all fish species caught during the specified time period. The relative abundance of fish species in the project site varied. Among the observed species, Chpin Muol had a relative abundance of 6%, Dom rey accounted for 34%, Kakek represented 32%, Kanchrook Krahorm had 6%, Konchos accounted for 8%, and Pkar Kor represented 10% of the total fish catch. The CPUE values in the project site in August 2022 ranged from 0.87 grams per hour to 5.69 grams per hour for different fish species. CPUE combined all fish species is 16.69 gram per hour.

Table 24: Fish Catch, Abundance and CPUE in Project Site in Aug 2022 in Krabei Chrum

Fish Species	Aug 2022		
	Fish Catch (g)	Relative Abundance	CPUE (gram/hour)
Chpin Muol	25	6%	0.96
Dom rey	148	34%	5.69
Ka- ek	138	32%	5.31
Kanchrook Krahorm	45	6%	0.87
Konchos	36	8%	1.38
Pkar Kor	42	10%	1.62
Total	434	100%	16.69

3.3.6. Fish Catch, Abundance and CPUE in Sep 2022 in Krabei Chrum

c. Control Site

In the control site of Krabei Chrum in September 2022, the fish catch survey recorded a total catch of 281 grams. This catch represents the combined weight of all fish species caught during the specified time period. The relative abundance of fish species in the control site varied. Among the observed species, Dom rey had a relative abundance of 38%, Konhchos accounted for 14%, Kontrop represented 33%, and Pkar Kor accounted for 15% of the total fish catch. The CPUE values in the control site in September 2022 ranged from 1.54 grams per hour to 4.08 grams per hour for different fish species. CPUE combined all fish species is 10.81 gram per hour.

Table 25: Fish Catch, Abundance and CPUE in Control Site in Sep 2022 in Krabei Chrum

Fish Species	Sep 2022		
	Fish Catch (g)	Relative Abundance	CPUE (gram/hour)
Dom rey	106	38%	4.08
Konhchos	40	14%	1.54
Kontrop	92	33%	3.54
Pkar Kor	43	15%	1.65
Total	281	100%	10.81

d. Project Site

In the project site of Krabei Chrum in September 2022, the fish catch survey recorded a total catch of 412 grams. This catch represents the combined weight of all fish species caught during the specified time period. The relative abundance of fish species in the project site varied. Among the observed species, Chkok had a relative abundance of 39%, ChraKeng accounted for 51%, and No Nong Lving represented 10% of the total fish catch. The CPUE values in the project site in September 2022 ranged from 1.50 grams per hour to 8.12 grams per hour for different fish species. CPUE combined all fish species is 15.85 gram per hour.

Table 26: Fish Catch, Abundance and CPUE in Project Site in Sep 2022 in Krabei Chrum

Fish Species	Sep 2022		
	Fish Catch (g)	Relative Abundance	CPUE (gram/hour)
	PS	PS	PS
Chkok	162	39%	6.23
ChraKeng	211	51%	8.12
No Nong Lving	39	10%	1.50
Total	412	100%	15.85

3.3.7. Fish Catch, Abundance and CPUE in Nov 2022 in Krabei Chrum

a. Control Site

In the control site of Krabei Chrum in November 2022, the fish catch survey recorded a total catch of 279 grams. This catch represents the combined weight of all fish species caught during the specified time period.

The relative abundance of fish species in the control site varied. Among the observed species, Chlaing had a relative abundance of 34%, Dom rey accounted for 26%, and Kahaer represented 40% of the total fish catch. The CPUE values in the control site in November 2022 ranged from 2.40 grams per hour to 3.73 grams per hour for different fish species. CPUE combined all fish species is 9.30 gram per hour.

Table 27: Fish Catch, Abundance and CPUE in Control Site in Nov 2022 in Krabei Chrum

Fish Species	Nov 2022		
	Fish Catch (g)	Relative Abundance	CPUE (gram/hour)
Chlaing	95	34%	3.17
Dom rey	72	26%	2.40
Kahaer	112	40%	3.73
Total	279	100%	9.30

22

b. Project Site

In November 2022, the fish catch, abundance, and CPUE (Catch Per Unit Effort) were monitored in Krabei Chrum, one of the project sites. The data collected provides insights into the fish population and fishing productivity in the area.

During the monitoring period, a total volume of 245 grams of fish catch was recorded for Krabei Chrum. This accounted for 100% of the relative abundance, indicating that Krabei Chrum was the most abundant fish species in the area during that time. The CPUE for Krabei Chrum was calculated to be 8.75 grams per hour, which represents the amount of fish caught per unit of fishing effort.

Another fish species, Dom rey, accounted for 165 grams of the total fish catch, representing 67% of the relative abundance. The CPUE for Dom rey was 5.89 grams per hour, indicating a slightly

lower catch rate compared to Krabei Chrum. Lastly, Kravea, another fish species, contributed 80 grams to the overall fish catch, representing 33% of the relative abundance. The CPUE for Kravea was 2.86 grams per hour, indicating a relatively lower catch rate compared to the other two species.

Table 28: Fish Catch, Abundance and CPUE in Project Site in Nov 2022 in Krabei Chrum

Fish Species	Nov 2022		
	Fish Catch (g)	Relative Abundance	CPUE (gram/hour)
	PS	PS	PS
Dom rey	165	67%	5.89
Kravea	80	33%	2.86
Total	245	100%	8.75

3.3.8. Fish Catch, Abundance and CPUE in Dec 2022 in Krabei Chrum

a. Control Site

In the control site of Krabei Chrum in December 2022, the fish catch survey recorded a total catch of 117 grams. This catch represents the combined weight of all fish species caught during the specified time period.

The relative abundance of fish species in the control site varied. Among the observed species, Por had a relative abundance of 18%, Ronong Lavi accounted for 60%, and Slab Mann represented 22% of the total fish catch. The CPUE values in the control site in December 2022 ranged from 0.75 grams per hour to 2.50 grams per hour for different fish species. CPUE combined all fish species is 4.18 gram per hour.

Table 29: Fish Catch, Abundance and CPUE in Control Site Dec 2022 in Krabei Chrum

Fish Species	Dec 2022		
	Fish Catch (g)	Relative Abundance	CPUE (gram/hour)
Por	21	18%	0.75
Nonong Laving	70	60%	
Slab Mann	26	22%	0.93
Fish Species	CS	CS	CS

b. Project Site

In the project site of Krabei Chrum in December 2022, the fish catch survey recorded a total catch of 230.1 grams. This catch represents the combined weight of all fish species caught during the specified time period.

The relative abundance of fish species in the project site varied. Among the observed species, ChraKeng had a relative abundance of 42%, kanjos chlang accounted for 31%, and Kravea represented 27% of the total fish catch. These relative abundance values help assess the composition and distribution of different fish species in the project site. The CPUE values in the

project site in December 2022 ranged from 2.21 grams per hour to 3.43 grams per hour for different fish species. CPUE combined all fish is 8.22 gram per hour.

Table 30: Fish Catch, Abundance and CPUE in Project Site Dec 2022 in Krabei Chrum

Fish Species	Dec 2022		
	Volum of Fish Catch (g)	Relative Abundance	CPUE (gram/hour)
	PS	PS	PS
ChraKeng	96	42%	3.43
kanjos chlang	72.1	31%	2.58
Kravea	62	27%	2.21
Total	230.1	100%	8.22

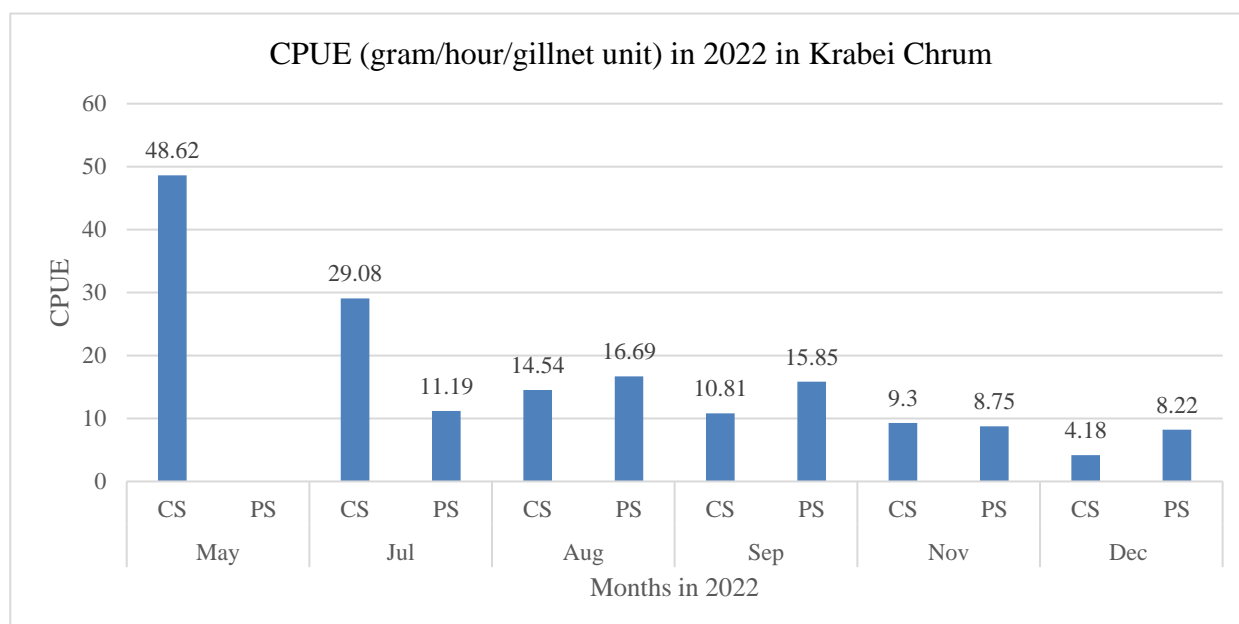
3.3.9. CPUE by Month 2022 in Krabei Chrum Village

In Krabei Chrum in 2022, the CPUE (Catch Per Unit Effort) values were monitored in both the project site (PS) and control site (CS) during the months of May, July, August, September, November, and December 2022.

In May, the CPUE in the control site was 48.62, while no fishing activity was in project site in May 2022. . In July 2022, the CPUE in control site was 29.08 gram per hour while the project site was 11.19 grams per hour. In August 2022, the CPUE in the control site was 14.54 gram per hour while the project site was 16.69 grams per hour.

In September 2022, the CPUE in the project site was 15.85 grams per hour, while in the control site it was 10.81 grams per hour. In November 2022, the CPUE in the project site was 8.75, while in the control site it was 9.30. In December, the CPUE in the project site was 8.22, while in the control site it was 4.18.

Figure 3: CPUE by Month 2022 in Krabei Chrum Village



3.4. Fish Catch, Relative Abundance and CPUE in Samkhoy Village

3.4.1. Gillnet Model in Research Model in Samkhoy Village

In the research conducted in Samkhoy village, gillnets were used as the fishing gear. The specifications of the gillnets used at both the Control Site and Project Site were the same. The gillnets had a length of 24 meters, a height of 2.4 meters, and a mesh size of 48 centimeters.

Table 31: Gillnets Used in Research

Site	Gillnets in Research		
	Length (m)	Hight (m)	Mesh (cm)
Control Site	24	2.4	48
Project Site	24	2.4	48

3.4.2. Fishing Hours in Samkhoy Village

In 2022, the fishing hours in Samkhoy village varied across different months. In February 2022, a total of 48 hours were spent fishing, with 24 hours at the control site (CS) and 24 hours at the project site (PS). March saw a decrease in fishing activity, with only 24 hours reported at the project site. July witnessed an increase in fishing hours, with 50 hours recorded, evenly split between the control site and project site. August and November also saw consistent fishing hours, with 37 and 50 hours respectively, split between CS and PS. September had a lower fishing duration of 11.75 hours, while October had no data provided for the control site but recorded 25 hours at the project site.

Table 32: Total Fishing Hours by Months in Samkhoy in 2022

Total Fishing Hours by Months in Samkhoy in 2022													
Feb		Mar		Jul		Aug		Sep		Oct		Nov	
CS	PS	CS	PS	CS	PS	CS	PS	CS	PS	CS	PS	CS	PS
48			24				37		11.75		50		50
24	24	0	24	25	25	12	25	11.75	0	25	25	25	25

Note: CS= control site, PS= Project Site

3.4.3. Fish Catch, Abundance and CPUE in Feb 2022 in Samkhoy Village

In February 2022, in Samkhoy village, a variety of fish species were caught. The total volume of fish catch for all species combined was 726 grams. Among the different species, Brakanndor had a catch volume of 112 grams, Chhaok Kdar had a catch volume of 307 grams, Chhlang had a catch volume of 80 grams, Chpin had a catch volume of 64 grams, and ChraKeng had a catch volume of 163 grams.

In February 2022, the relative abundance of different fish species in Samkhoy village was assessed. The data revealed that Brakanndor accounted for 15% of the total fish catch, while

Chhaok Kdar had the highest relative abundance at 42%. Chhlang and Chpin followed with relative abundances of 11% and 9% respectively. Lastly, ChraKeng made up 22% of the total fish catch.

In February 2022, the Catch Per Unit Effort (CPUE) was calculated to assess the productivity of different fish species in Samkhoy village. The CPUE is a measure of the average amount of fish caught per unit of fishing effort, typically measured in grams per hour.

In February 2022, the catch per unit effort (CPUE) data was collected for various fish species in Samkhoy village. The overall CPUE for all fish species combined was recorded at 15.13 grams per hour. Breaking down the CPUE for individual fish species, Brakanndor had a CPUE of 2.33 grams per hour, Chhaok Kdar had a CPUE of 6.40 grams per hour, Chhlang had a CPUE of 1.67 grams per hour, Chpin had a CPUE of 1.33 grams per hour, and ChraKeng had a CPUE of 3.40 grams per hour.

Table 33: Fish Catch, Abundance and CPUE in Feb 2022 in Samkhoy Village

Fish Species	Feb 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Brakanndor		112	112	0%	64%	15%	0.00	4.67	2.33
Chhaok Kdar	307	0	307	56%	0%	42%	12.79	0.00	6.40
Chhlang	80	0	80	15%	0%	11%	3.33	0.00	1.67
Chpin	0	64	64	0%	36%	9%	0.00	2.67	1.33
ChraKeng	163		163	30%	0%	22%	6.79	0.00	3.40
Total	550	176	726	100%	100%	100%	22.9167	7.333	15.13

3.4.4. Fish Catch, Abundance and CPUE in March 2022 in Samkhoy Village

In March 2022, fish catch data was recorded in Samkhoy village, providing valuable information about the catch volumes of different fish species. The total catch volume for all fish species combined was 274 grams. The highest catch volume was observed for Andeng Tun, with a recorded volume of 147 grams. Chhkaok Kdar followed with a catch volume of 60 grams, while Khnong Bornla and Sleuk Russey had catch volumes of 34 grams and 33 grams, respectively.

In May 2022, the relative abundance of fish species in Samkhoy village was recorded. The data shows the proportional representation of each fish species within the overall fish population. According to the data, Andeng Tun had the highest relative abundance, accounting for 54% of the fish population. Chhkaok Kdar followed with a relative abundance of 22%, while both Khnong Bornla and Sleuk Russey had a relative abundance of 12% each.

In March 2022, CPUE data was collected in Samkhoy village to assess the catch rates of various fish species per hour of fishing effort. The recorded CPUE values for the different fish species

were as follows: All Fish Species (11.43 grams/hour), Andeng Tun (6.13 grams/hour), Chhkaok Kdar (2.50 grams/hour), Khnong Bornla (1.42 grams/hour), and Sleuk Russey (1.38 grams/hour).

Table 34: Fish Catch, Abundance and CPUE in March 2022 in Samkhoy Village

Fish Species	Mar 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Andeng Tun		147	147		54%	54%		6.13	6.13
Chhkaok kdar		60	60		22%	22%		2.50	2.50
Khnong bornla		34	34		12%	12%		1.42	1.42
Sleuk Russey		33	33		12%	12%		1.38	1.38
Total		274	274		100%	100%		11.43	11.43

3.4.5. Fish Catch, Abundance and CPUE in July 2022 in Samkhoy Village

In July 2022, the total fish catch for the month was **867.3 gram per hour**. Of the total fish catch in **July 2022**, Ach Kok accounted for 55.2 grams while Changva Plieng for 52.4 grams. The other fish species include Chhkaok kdar, Chpin ChraKeng was caught with volume of each was 130.5, 242.9, and 386.3 gram respectively.

In July 2022, the relative abundance of fish species in Samkhoy village was recorded, providing insights into the distribution and prevalence of different species in the fish population. The data shows that ChraKeng accounted for the highest relative abundance at 45%, followed by Chpin and Chhkaok kdar at 28% and 15% respectively. Ach Kok and Changva Plieng had the same relative abundance at 6%.

In July 2022, the catch per unit effort (CPEU) per hour per gillnet unit was recorded for different fish species in Samkhoy village. The CPEU combined fish species is 17.35 grams per hour. Among the species, Chra Keng was 7.73 grams per hour while Chpin was 4.86 grams per hour. Arch Kok and Changva Plieng had lower CPEU values at 1.10 and 1.05 grams per hour respectively.

Table 35: Abundance and CPUE in Jul 2022 in Samkhoy Village

Fish Species	Jul 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Ach Kok	55.2		55.2	9%	0%	6%	2.21	0.00	1.10
Changva Plieng	52.4		52.4	9%	0%	6%	2.10	0.00	1.05
Chhkaok kdar		130.5	130.5	0%	46%	15%	0.00	5.22	2.61
Chpin	130	112.9	242.9	22%	40%	28%	5.20	4.52	4.86
ChraKeng	344.8	41.5	386.3	59%	15%	45%	13.79	1.66	7.73
Total	582.4	284.9	867.3	100%	100%	100%	23.296	11.396	17.346

3.4.6. Fish Catch, Abundance and CPUE in Aug 2022 in Samkhoy Village

In August 2022, the fish catch data for Samkhoy village included two fish species: ChraKeng and Kanchos Kmao. The catch for ChraKeng was recorded at 230.2, while Kanchos Kmao had a catch of 152.4. These numbers represent the quantity or weight of fish caught in Samkhoy village during that specific time period with 382.6 grams.

In August 2022, the relative abundance of fish species in Samkhoy village was recorded. Among all the fish species, ChraKeng accounted for 60% of the fish population, indicating that it was the sole species present during that time period. Kanchos Kmao, on the other hand, had a relative abundance of 40%, suggesting it constituted a smaller proportion of the fish population.

In Samkhoy village during August 2022, the catch per unit effort (CPUE) values indicated varying catch rates for different fish species. Kanchos Kmao had a CPUE of 6.096 grams per hour, suggesting a moderate catch rate for this particular species. ChraKeng, on the other hand, had a higher CPUE of 9.208 grams per hour, indicating a relatively better catch rate. The overall CPUE for all fish species combined was 15.3 grams per hour.

Table 36: Fish Catch, Abundance and CPUE in Aug 2022 in Samkhoy

Fish Species	Aug 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
ChraKeng		230.2	230.2		60%	60%		9.208	9.208
Kanchos Kmao		152.4	152.4		40%	40%		6.096	6.096
Total		382.6	382.6		100%	100%		15.3	15.3

3.4.7. Fish Catch, Abundance and CPUE in September 2022 in Samkhoy Village

These values represent the total weight of fish caught for each species during the specified time period. In September 2022, the fishing activity was carried only in project site. Chpin had a catch of 104.2 grams, while ChraKeng had a catch of 174.2 grams. The overall catch for all fish species combined in Samkhoy village during September 2022 was 278.4 grams.

In September 2022, the relative abundance of fish species in Samkhoy village was assessed, with two main species identified: Chpin and ChraKeng. Chpin had a relative abundance of 37%, while ChraKeng had a higher relative abundance of 63%.

In September 2022, the CPUE (Catch Per Unit Effort) in Samkhoy village for fish species was recorded. The CPUE is a measure used to estimate the average amount of fish caught per unit of fishing effort. The data provided includes three values: 23.69 grams per hour for all fish species, 8.868 grams per hour for Chpin, and 14.83 grams per hour for ChraKeng.

Table 37: Fish Catch, Abundance and CPUE in Sep 2022 in Samkhoy Village

Fish Species	Sep 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Chpin	104.2		104.2	37%		37%	8.868		8.868
ChraKeng	174.2		174.2	63%		63%	14.83		14.83
Total	278.4		278.4	100%		100%	23.69		23.69

3.4.8. Fish Catch, Abundance and CPUE in Oct 2022 in Samkhoy Village

In October 2022, the fish catch in Samkhoy village was recorded, providing insights into the volume of fish caught for various species. The data includes the weight of fish catch in grams for "All Fish Species," "An Deng Reung," "Chkaok," "ChraKeng," "Domrey," and "Kray." The total volume of fish caught for all species combined was 2019.8 grams, indicating the overall fish catch in the village during that month. Additionally, specific species such as An Deng Reung, Chkaok, ChraKeng, Domrey, and Kray had respective catch volumes of 322.2 grams, 354.4 grams, 216.2 grams, 950.8 grams, and 176.2 grams.

The relative abundance of fish species in Samkhoy village in October 2022 provides valuable information about the composition and distribution of different fish species in the area. The data reveals that the most abundant species in terms of relative abundance were Domrey, accounting for 47% of the fish catch, followed by Chkaok at 18%, An Deng Reung at 16%, ChraKeng at 10%, and Kray at 9%. These percentages indicate the proportion of each species within the overall fish catch during that month.

The catch per unit effort (CPUE) data for October 2022 in Samkhoy village provides valuable information about the productivity of fishing efforts for different fish species. The overall CPUE for all fish species combined was 40.4 grams per hour. Among the specific species, Domrey had the highest CPUE at 19.02 grams per hour, followed by Chkaok at 7.088 grams per hour, ChraKeng at 4.324 grams per hour, Kray at 3.524 grams per hour and An Deng Loeng was at 6.444 grams per hour.

Table 38: Fish Catch, Abundance and CPUE in Oct 2022 in Samkhoy Village

Fish Species	Oct 2022								
	Volum of Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
An Deng Reung		322.2	322.2	0%	22%	16%	0	12.89	6.444
Chkaok	354.4		354.4	62%	0%	18%	14.18	0	7.088
ChraKeng	216.2		216.2	38%	0%	10%	8.648	0	4.324
Domrey		950.8	950.8	0%	66%	47%	0	38.03	19.02
Kray		176.2	176.2	0%	12%	9%	0	7.048	3.524
Total	570.6	1449.2	2019.8	100%	100%	100%	22.82	57.97	40.4

3.4.9. Fish Catch, Abundance and CPUE in Nov 2022 in Samkhoy Village

In November 2022, the fish catch data for Samkhoy village reveals the volume of fish caught for different species. The total volume of fish catch for all fish species combined was recorded at 809.9 grams. Among the specific species mentioned, Chpin Muol had a catch volume of 218.7 grams, while ChraKeng had a catch volume of 591.2 grams.

In November 2022, the relative abundance of fish species in Samkhoy village was recorded, providing valuable insights into the distribution and composition of the fish population. The data reveals that Chpin Muol accounted for 27% of the total fish population, while ChraKeng made up 73%. Additionally, the relative abundance of all fish species combined was 100%.

In November 2022, the Catch Per Unit Effort (CPUE) data for fish species in Samkhoy village was recorded. The CPUE for all fish species combined was recorded at 16.2 grams per hour, while Chpin Muol had a CPUE of 4.37 grams per hour and ChraKeng had a CPUE of 11.82 grams per hour.

Table 39: Fish Catch, Abundance and CPUE in Nov 2022 in Samkhoy

Fish Species	Nov 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Chpin Muol	165.5	53.2	218.7	78%	9%	27%	6.62	2.13	4.37
ChraKeng	47.1	544.1	591.2	22%	91%	73%	1.88	21.76	11.82
Total	212.6	597.3	809.9	100%	100%	100%	8.504	23.89	16.2

3.4.10. 3.3.9. CPUE by Month 2022 in Samkhoy Village

In Samkhoy village, the CPUE (Catch Per Unit Effort) values were monitored in both the project site (PS) and control site (CS) during the months of February, March, July, August, September, October, and November in 2022.

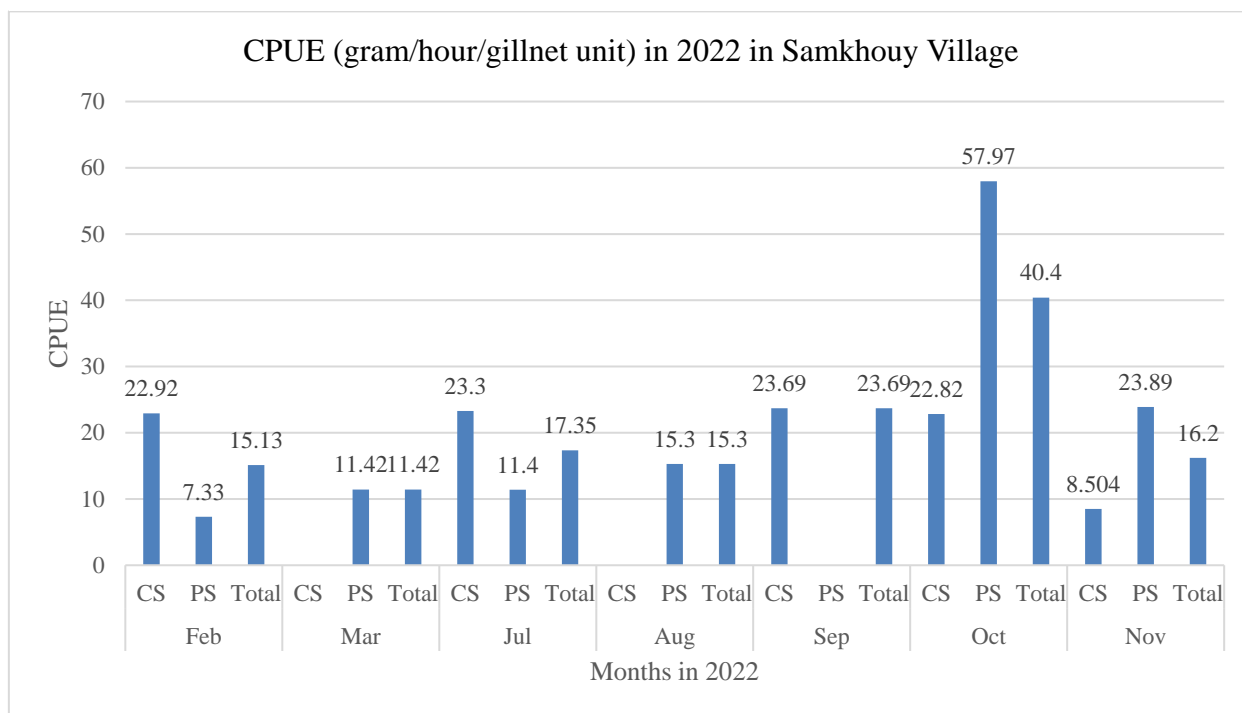
In February 2022, the CPUE in the project site was 7.33, while in the control site it was 22.92. The total CPUE for both sites combined was 15.13. In March, the CPUE in the project site was 11.42, while in the control site it was also 11.42. The total CPUE for both sites combined was 23.30.

In July 2022, the CPUE in the control site was 23.3, while the project site was 11.40. The CPUE for both sites combined was 17.35. In August 2022, the CPUE in the project site was 15.30 but there was no fishing activity in the control site. The CPUE for both sites combined was 15.3 grams per hour.

In September 2022, the CPUE in the project site, there was no fishing activity, while in the control site it was 23.69 grams per hour/Gillnet unit. The CPUE for both sites combined was 57.97 grams per hour. In October 2022, the CPUE in the project site was 57.97, while in the control site it was 22.82 grams per hour. The CPUE for both sites combined was 40.4 grams per hour.

In November 2022, the CPUE in the project site was 23.89 grams per hour, while in the control site it was 8.504 grams per hour. The CPUE for both sites combined was 16.2 grams per hour.

Figure 4: CPUE by Month 2022 in Samkhoy Village



3.5. Fish Catch, Relative Abundance and CPUE in Sdao 1 Village

3.5.1. Gillnet Dimensions in Sdao 1 Village

The gillnets used in the research have a length of 50 meters, a height of 2.84 meters, and a mesh size of 6.56 centimeters. The fishing for this research in Sdao 1 was carried out only control site.

Table 40: Gillnets in Research in Sdao 1 Village

Site	Gillnets in Research		
	Length (m)	Hight (m)	Mesh (cm)
Control Site	50	2.84	6.56

3.5.2. Fishing Hours in Sdao 1 Village

In 2022, the fishing hours in Sdao 1 Village remained consistent at the control site (CS) across several months. In January, February, and July in 2022, a total of 36 hours were recorded at the Control Site, indicating a regular fishing activity throughout these months. March saw a slight

decrease in fishing hours, with 24 hours reported at the Control Site. April witnessed another increase, with 36 hours spent fishing. August 2022 had a lower fishing duration of 24 hours.

Table 41: Total Fishing Hours by Months in Sdao 1 Village in 2022

Total Fishing Hours by Months in Sdao 1 Village in 2022					
Jan	Feb	Mar	Apr	Jul	Aug
CS	CS	CS	CS	CS	CS
36	36	24	36	36	24

Note: CS= control site, PS= Project Site

3.5.3. Fish Catch, Abundance and CPUE in Jan 2022 in Sdao 1 Village

In January 2022, the fish catch data for Sdao 1 village revealed the volume of fish caught for various fish species. The total volume of fish catch for all species combined was recorded at 3709 grams. Among the specific fish species mentioned, the highest volume of fish catch was for the ka-ek species with 2221 grams, followed by Chkaok Kdar with 1010 grams. Antat chhke, Chpin Muol, and Chpin sambet had lower volumes of fish catch with 214 grams, 138 grams, and 126 grams, respectively.²²

In January 2022, the relative abundance of fish species in Sdao 1 village was recorded, providing valuable information on the proportion of each species within the fish population. The data revealed that the most abundant fish species during that month was ka-ek, constituting 60% of the total fish population. Chkaok kdar followed with a relative abundance of 27%, while Antat chhke, Chpin Muol, and Chpin sambet had lower relative abundances of 6%, 4%, and 3% respectively.

In January 2022, the Catch Per Unit Effort (CPUE) data for Sdao 1 village was collected, providing information on the average amount of fish caught per unit of fishing effort, measured in grams per hour. The CPUE values for different fish species revealed varying catch rates. The highest CPUE was recorded for the ka-ek species, with an average catch of 61.69 grams per hour. Chkaok kdar followed with a CPUE of 28.06 grams per hour, while Antat chhke, Chpin Muol, and Chpin sambet had lower CPUE values of 5.94 grams per hour, 3.83 grams per hour, and 3.50 grams per hour, respectively.

Table 42: Fish Catch, Abundance and CPUE in Jan 2022 in Sdao 1

Fish Species	Jan 2022								
	Volum of Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Antat chhke	214		214	6%		6%	5.94		5.94
chkaok kdar	1010		1010	27%		27%	28.06		28.06
Chpin Muol	138		138	4%		4%	3.83		3.83
Chpin sambet	126		126	3%		3%	3.50		3.50

ka-ek	2221		2221	60%		60%	61.69		61.69
Total	3709		3709	100%		100%	103		103

3.5.4. Fish Catch, Abundance and CPUE in Feb 2022 in Sdao 1 Village

In February 2022, the fish catch data for Sdao 1 village was recorded, providing information on the volume of fish caught in grams. The total fish catch for all species combined was 4215 grams. Among the individual fish species, Chpin Meas had the highest catch volume with 1633 grams, followed by Kes with 937 grams, Po with 678 grams, Chpin Sambet with 210 grams, Changva Nornong with 128 grams, Chhmann with 123 grams, and Kla with 506 grams. These catch data give valuable insights into the composition and abundance of fish species in Sdao 1 village during February 2022.

In February 2022, the relative abundance of different fish species in Sdao 1 village was recorded, providing insights into the distribution and prevalence of each species within the fish population. Among all fish species combined, Chpin Meas had the highest relative abundance, accounting for 39% of the total fish catch. Kes followed with a relative abundance of 22%, while Po and Kla had relative abundances of 16% and 12% respectively. Chpin sambet, Changva Nornong, and Chhmann had lower relative abundances of 5%, 3%, and 3% respectively. These relative abundance values highlight the dominance of Chpin Meas in the fish population of Sdao 1 village during February 2022.

In February 2022, the Catch Per Unit Effort (CPUE) data for Sdao 1 village were recorded, providing valuable information on the productivity of fishing activities in terms of the amount of fish caught per hour of fishing effort in grams. The overall CPUE for all fish species combined was 117.08 grams per hour, indicating the average catch rate per hour of fishing in the village during that month. Among the individual fish species, Chpin Meas had the highest CPUE with 45.36 grams per hour, followed by Kes with 26.03 grams per hour, Po with 18.83 grams per hour, and Chpin sambet with 5.83 grams per hour. The lower CPUE values for Changva Nornong, Chhmann, and Kla suggested a comparatively lower catch rate for these species.

Table 43: Fish Catch, Abundance and CPUE in Feb 2022 in Sdao 1

Fish Species	Feb 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Changva Nornong	128		128	3%		3%	3.56		3.56
Chhmann	123		123	3%		3%	3.42		3.42
Chpin Meas	1633		1633	39%		39%	45.36		45.36
Chpin sambet	210		210	5%		5%	5.83		5.83
Kes	937		937	22%		22%	26.03		26.03
kla	506		506	12%		12%	14.06		14.06

Po	678		678	16%		16%	18.83		18.83
Total	4215		4215	100%		100%	117.08		117.08

3.5.5. Fish Catch, Abundance and CPUE in Mar 2022 in Sdao 1 Village

In March 2022, the fish catch data for Sdao 1 village revealed the volume of fish caught in grams for various species. The total fish catch for all species combined was 3166 grams. Among the individual species, Ka-ek had the highest volume of fish catch with 1451 grams, followed by Po with 879 grams and Crosmemay with 219 grams. Other species such as Slat, Cros, and Reil Tob also contributed to the fish catch, albeit in smaller volumes.

In March 2022, the relative abundance data for fish species in Sdao 1 village revealed the proportion of each species in relation to the total fish population. Among the fish species, Ka-ek had the highest relative abundance with 46%, followed by Po with 28% and Crosmemay with 7%. Other species such as Slat, Cros, and Reil Tob also contributed to the fish population, albeit in smaller proportions.

In March 2022, the Catch Per Unit Effort (CPUE) data for Sdao 1 village provided valuable insights into the productivity of fishing activities and the catch rate per hour of fishing effort for different fish species. The overall CPUE for all fish species combined was 87.94 grams per hour, indicating the average catch rate per hour of fishing in the village during that month. Among the individual fish species, Ka-ek had the highest CPUE with 40.31 grams per hour, followed by Po with 24.42 grams per hour and Crosmemay with 6.083 grams per hour. Other species, such as Slat, Cros, and Reil Tob also had noticeable CPUE values, albeit lower in comparison.

Table 44: Fish Catch, Abundance and CPUE in Mar 2022 in Sdao 1

All Fish Species	Mar 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Chhviet	82		82	3%		3%	2.28		2.278
chonhchok dei	30		30	1%		1%	0.83		0.833
Cros	73		73	2%		2%	2.03		2.028
Cros memay	114		114	4%		4%	3.17		3.167
Crosmemay	219		219	7%		7%	6.08		6.083
ka-ek	1451		1451	46%		46%	40.31		40.31
Kampliev	41		41	1%		1%	1.14		1.139
Po	879		879	28%		28%	24.42		24.42
Reil Angam	61		61	2%		2%	1.69		1.694
Reil Tob	82		82	3%		3%	2.28		2.278
Slat	134		134	4%		4%	3.72		3.722
Total	3166		3166	100%		100%	87.94		87.94

3.5.6. Fish Catch, Abundance and CPUE in Apr 2022 in Sdao 1 Village

In April 2022, the fish catch data for Sdao 1 village revealed the volume of fish caught in grams for various fish species. The total fish catch for all species combined was 2265 grams. Among the individual species, Chhkaok kdar had the highest catch volume with 708 grams, followed by Kantrob with 679 grams and ChraKeng with 346 grams. Other species such as Chpin, Chhviet, Kae, and Chhlounh also contributed to the fish catch, albeit in smaller quantities.

In April 2022, the relative abundance data for fish species in Sdao 1 village indicated the proportion of each species in relation to the total fish population. Among the fish species, Kantrob had the highest relative abundance with 30%, followed by Chhkaok kdar with 31% and ChraKeng with 15%. Other species such as Chpin, Chhviet, Chhlounh, and Kae also contributed to the fish population, albeit in smaller proportions.

In April 2022, the Catch Per Unit Effort (CPUE) data for fish species in Sdao 1 village provided information on the average amount of fish caught per hour of fishing effort, measured in grams per hour. The overall CPUE for all fish species combined was 94.38 grams per hour, indicating the average productivity of fishing activities in the village during that month. Among the individual fish species, Chhkaok kdar had the highest CPUE with 29.5 grams per hour, followed by Kantrob with 28.29 grams per hour and ChraKeng with 14.42 grams per hour. Other species such as Chpin, Chhviet, Chhlounh, and Kae also contributed to the overall CPUE, albeit in smaller quantities.

Table 45: Fish Catch, Abundance and CPUE in Apr 2022 in Sdao 1

Fish Species	Apr 2022								
	Volum of Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Chhkaok kdar	708		708	31%		31%	29.5		29.5
chhlounh	86		86	4%		4%	3.583		3.583
Chhviet	102		102	5%		5%	4.25		4.25
Chpin	276		276	12%		12%	11.5		11.5
ChraKeng	346		346	15%		15%	14.42		14.42
Kae	68		68	3%		3%	2.833		2.833
Kantrob	679		679	30%		30%	28.29		28.29
Total	2265		2265	100%		100%	94.38		94.38

3.5.7. Fish Catch, Abundance and CPUE in Jul 2022 in Sdao 1

In July 2022, the fish catch data for Sdao 1 village indicated the volume of fish caught in grams for different fish species. The total fish catch for all species combined was 434.6 grams. Among the individual species, ChraKeng had the highest catch volume with 328.9 grams, followed by

TroSek with 105.7 grams. These figures represent the total amount of fish caught for each species during the specified time period.

In July 2022, the relative abundance of fish species in Sdao 1 village was assessed to understand the composition and distribution of the fish population. The data revealed that ChraKeng had the highest relative abundance, accounting for 76% of the total fish population during that period. TroSek, on the other hand, had a relative abundance of 24%.

In July 2022, the CPUE data for all fish species combined in Sdao 1 village during that period was recorded as 12.07 grams per hour. This indicates the average amount of fish caught per hour of fishing effort for the entire fish population in the village. Furthermore, the CPUE for ChraKeng species was 9.14 grams per hour, while for TroSek species, it was 2.94 grams per hour.

Table 46: Fish Catch, Abundance and CPUE in Jul 2022 in Sdao 1

Fish Species	Jul 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
ChraKeng	328.9		328.9	76%		76%	9.14		9.14
TroSek	105.7		105.7	24%		24%	2.94		2.94
Total	434.6		434.6	100%		100%	12.0722		12.0722

3.5.8. Fish Catch, Abundance and CPUE in Aug 2022 in Sdao 1

In August 2022, data was collected in Sdao 1 village to assess the fish catch, relative abundance, and CPUE (Catch Per Unit Effort). The total volume of fish caught during this period was recorded as 223.43 grams. This data provides valuable information about the overall productivity of fishing activities in the village.

By analyzing the relative abundance of fish species, it was found that ChraKeng accounted for 85% of the fish population, while TroSek represented 15%. This indicates that ChraKeng was the dominant species in Sdao 1 village during August 2022.

The CPUE data revealed that the average amount of fish caught per hour of fishing effort for all species combined was 9.31 grams. Specifically, the CPUE for ChraKeng was 7.87 grams per hour, while for TroSek, it was 1.44 grams per hour.

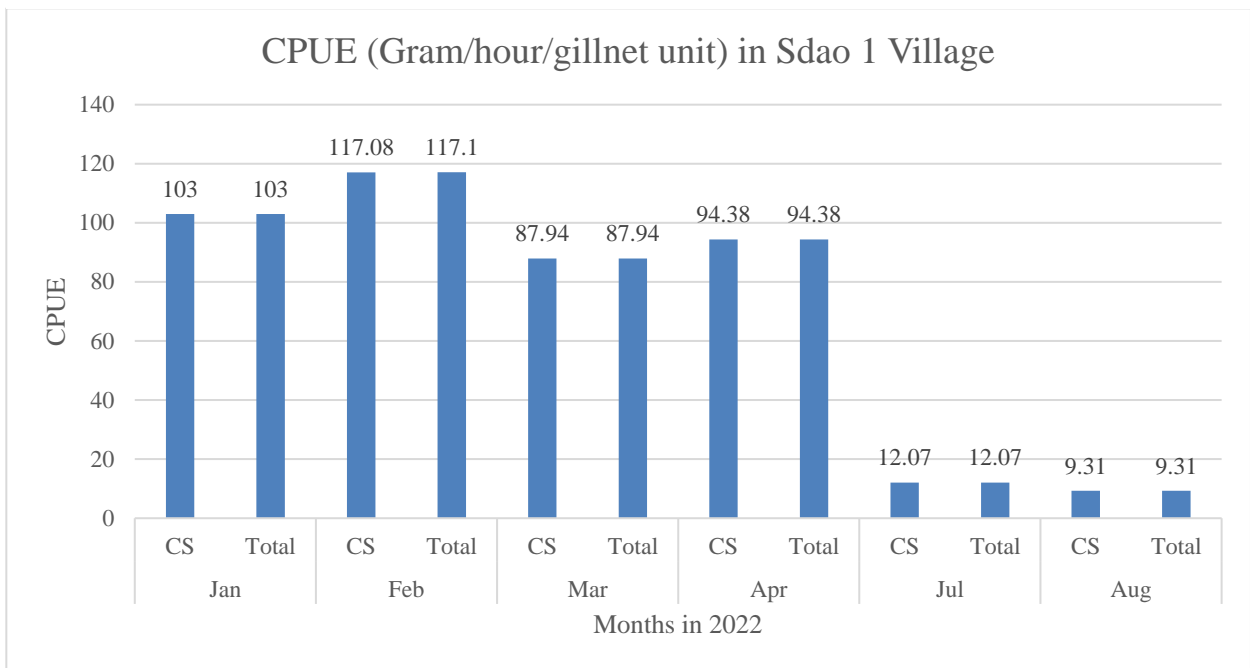
Table 47: Fish Catch, Abundance and CPUE in Aug 2022 in Sdao 1

Fish Species	Aug 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
ChraKeng	188.8		188.8	85%		85%	7.87		7.87
TroSek	34.63		34.63	15%		15%	1.44		1.44
Total	223.43		223.43	100%		100%	9.31		9.31

3.5.9.3.4.9. CPUE by Month 2022 in Sdao 1 Village

In Sdao 1 village, the CPUE (Catch Per Unit Effort) values were monitored in the control site (CS) over a six-month period. The CPUE values varied throughout the months, indicating fluctuations in fishing productivity. In January 2022, the CPUE was 103, which increased to 117.08 in February. However, in March, the CPUE dropped to 87.94, followed by a slight increase in April to 94.38. The CPUE values took a significant decline in July to 12.07 and further dropped to 9.31 in August 2022.

Table 48: CPUE by Month 2022 in Sdao 1 Village



3.6. Fish Catch, Relative Abundance and CPUE in Srae Sranok Village

3.6.1. Fishing Gears in Research Model in Srae Sranok Village

In the provided table, the details of the gillnets used in research at the Srae Sranok site are presented. According to the table, the gillnets used in research at the Control Site in Srae Sranok have a length of 30.00 meters and a height of 2.50 meters. The mesh size, which refers to the size of the openings in the net, is indicated as 5.67 centimeters.

Table 49: Gillnets in Research in Srae Sranok

Site	Gillnets in Research		
	Length (m)	Hight (m)	Mesh (cm)
Control Site	30.00	2.50	5.67

3.6.2. Fishing Hours in Srae Sranok Village

The table provides information on the total fishing hours by month in Srae Sranok Village during the year 2022. The fishing for research in Srae Sranok village carried out only in project site. In each month, the fishing took 30 hours.

Table 50: Total Fishing Hours by Months in Srae Sranok Village in 2022

Total Fishing Hours by Months in Srae Sranok Village in 2022					
May	Jul	Aug	Sep	Nov	Dec
PS	PS	PS	PS	PS	PS
30	30	30	30	30	30

Note: CS= control site, PS= Project Site

3.6.3. Fish Catch, Abundance, CPUE in May 2022 in Srae Sranok Village

In May 2022, data was collected in Srae Sranok to assess the fish catch, relative abundance, and CPUE (Catch Per Unit Effort). The data for the different metrics are as follows: Fish Catch: The total volume of fish caught in Srae Sranok during May 2022 was recorded as 2184 grams. This represents the combined weight of all fish species caught during that period.

Relative Abundance: The relative abundance of fish species in Srae Sranok in May 2022 was determined. The data shows that Chpin Muol and Chpin sambet both had a relative abundance of 20% and 18% respectively, while ChraKeng, Kahaer, Kmann, and Pkar Kor each had a relative abundance of 22%, 9%, 9%, and 22% respectively.

CPUE: The CPUE was measured to determine the productivity of fishing efforts in Srae Sranok. The CPUE for all fish species combined was recorded as 72.8 grams per hour. This indicates the average amount of fish caught per hour of fishing effort for the entire fish population in the area. Additionally, the CPUE for each individual fish species was recorded, with Chpin Muol, Chpin sambet, ChraKeng, Kahaer, Kmann, and Pkar Kor having CPUE values of 14.37, 13.17, 16.33, 6.2, 6.5, and 16.23 grams per hour respectively.

Table 51: Fish Catch, Abundance, CPUE in May 2022 in Srae Sranok

Fish Species	May 2022								
	Volum of Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
		2184	2184		100%	100%		72.8	72.8
Chpin Muol		431	431		20%	20%		14.37	14.37
Chpin sambet		395	395		18%	18%		13.17	13.17
ChraKeng		490	490		22%	22%		16.33	16.33
Kahaer		186	186		9%	9%		6.2	6.2
Kmann		195	195		9%	9%		6.5	6.5
Pkar Kor		487	487		22%	22%		16.23	16.23

3.6.4. Fish Catch, Abundance, CPUE in Jul 2022 in Srae Sranok Village

In July 2022, data was collected in Srae Sranok to assess the fish catch, relative abundance, and CPUE (Catch Per Unit Effort). The data for the different metrics are as follows:

Fish Catch: The total volume of fish caught in Srae Sranok during July 2022 was recorded as 3801 grams. This represents the combined weight of all fish species caught during that period.

Relative Abundance: The relative abundance of fish species in Srae Sranok in July 2022 was determined. The data shows that Chkok Kdar had a relative abundance of 7%, Chveat had a relative abundance of 37%, Konhchos had a relative abundance of 32%, Panak had a relative abundance of 12%, and Slab Mann had a relative abundance of 12%.

CPUE: The CPUE was measured to determine the productivity of fishing efforts in Srae Sranok. The CPUE for all fish species combined was recorded as 126.7 grams per hour. This indicates the average amount of fish caught per hour of fishing effort for the entire fish population in the area. Additionally, the CPUE for each individual fish species was recorded, with Chkok Kdar, Chveat, Konhchos, Panak, and Slab Mann having CPUE values of 9.17, 47.00, 40.67, 15.10, and 14.77 grams per hour respectively.

Table 52: Fish Catch, Abundance, CPUE in Jul 2022 in Srae Sranok

Fish Species	Jul 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Chkok Kdar		275	275		7%	7%		9.17	9.17
Chveat		1410	1410		37%	37%		47.00	47.00
Konhchos		1220	1220		32%	32%		40.67	40.67
Panak		453	453		12%	12%		15.10	15.10
Slab Mann		443	443		12%	12%		14.77	14.77
Total		3801	3801		100%	100%		126.7	126.7

3.6.5. Fish Catch, Abundance, CPUE in Aug 2022 in Srae Sranok Village

In August 2022, data was collected in Srae Sranok to assess the fish catch, relative abundance, and CPUE (Catch Per Unit Effort). The data for the different metrics are as follows:

Fish Catch: The total volume of fish caught in Srae Sranok during August 2022 was recorded as 1951 grams. This represents the combined weight of all fish species caught during that period.

Relative Abundance: The relative abundance of fish species in Srae Sranok in August 2022 was determined. The data shows that Chkok Muol had a relative abundance of 42%, Chlang had a relative abundance of 8%, Chlat had a relative abundance of 14%, Dom rey had a relative abundance of 24%, and Konhchos had a relative abundance of 12%.

CPUE: The CPUE was measured to determine the productivity of fishing efforts in Srae Sranok. The CPUE for all fish species combined was recorded as 65.03 grams per hour. This indicates the average amount of fish caught per hour of fishing effort for the entire fish population in the area. Additionally, the CPUE for each individual fish species was recorded, with Chkok Muol, Chlang, Chlat, Dom rey, and Konhchos having CPUE values of 27.37, 5.267, 9.333, 15.57, and 7.5 grams per hour respectively.

Table 53: Fish Catch, Abundance, CPUE in Aug 2022 in Srae Sranok

Fish Species	Aug 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Chkok Muol		821	821		42%	42%		27.37	27.37
Chlang		158	158		8%	8%		5.267	5.267
Chlat		280	280		14%	14%		9.333	9.333
Dom rey		467	467		24%	24%		15.57	15.57
Konhchos		225	225		12%	12%		7.5	7.5
Total		1951	1951		100%	100%		65.03	65.03

3.6.6. Fish Catch, Abundance, CPUE in Sep 2022 in Srae Sranok Village

In September 2022, data was collected in Srae Sranok to assess the fish catch, relative abundance, and CPUE (Catch Per Unit Effort). The data for the different metrics are as follows:

Fish Catch: The total volume of fish caught in Srae Sranok during September 2022 was recorded as 1608 grams. This represents the combined weight of all fish species caught during that period.

Relative Abundance: The relative abundance of fish species in Srae Sranok in September 2022 was determined. The data shows that Chlat had a relative abundance of 7%, Chveat had a relative abundance of 9%, Dom rey had a relative abundance of 8%, Kahaer had a relative abundance of 74%, and Skok Muol had a relative abundance of 3%.

CPUE: The CPUE was measured to determine the productivity of fishing efforts in Srae Sranok. The CPUE for all fish species combined was recorded as 53.6 grams per hour. This indicates the average amount of fish caught per hour of fishing effort for the entire fish population in the area. Additionally, the CPUE for each individual fish species was recorded, with Chlat, Chveat, Dom rey, Kahaer, and Skok Muol having CPUE values of 3.53, 4.87, 4.13, 39.60, and 1.47 grams per hour respectively.

Table 54: Fish Catch, Abundance, CPUE in Sep 2022 in Srae Sranok

Fish Species	Sep 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
Chlat		106	106		7%	7%		3.53	3.53
Chveat		146	146		9%	9%		4.87	4.87
Dom rey		124	124		8%	8%		4.13	4.13
Kahaer		1188	1188		74%	74%		39.60	39.60
Skok Muol		44	44		3%	3%		1.47	1.47
Total		1608	1608		100%	100%		53.6	53.6

3.6.7. Fish Catch, Abundance, CPUE in Nov 2022 in Srae Sranok Village

In November 2022, data was collected in Srae Sranok to assess the fish catch, relative abundance, and CPUE (Catch Per Unit Effort). The data for the different metrics are as follows:

Fish Catch: The total volume of fish caught in Srae Sranok during November 2022 was recorded as 582.3 grams. This represents the combined weight of all fish species caught during that period.

Relative Abundance: The relative abundance of fish species in Srae Sranok in November 2022 was determined. The data shows that ChraKeng had a relative abundance of 26%, Dom rey had a relative abundance of 11%, Kmann had a relative abundance of 20%, Konhchos had a relative abundance of 37%, and Skok Muol had a relative abundance of 6%.

CPUE: The CPUE was measured to determine the productivity of fishing efforts in Srae Sranok. The CPUE for all fish species combined was recorded as 19.41 grams per hour. This indicates the average amount of fish caught per hour of fishing effort for the entire fish population in the area. Additionally, the CPUE for each individual fish species was recorded, with ChraKeng, Dom rey, Kmann, Konhchos, and Skok Muol having CPUE values of 5.07, 2.16, 3.93, 7.14, and 1.11 grams per hour respectively.

Table 55: Fish Catch, Abundance, CPUE in Nov 2022 in Srae Sranok

Fish Species	Nov 2022								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
ChraKeng		152	152		26%	26%		5.07	5.07
Dom rey		64.8	64.8		11%	11%		2.16	2.16
Kmann		118	118		20%	20%		3.93	3.93
Konhchos		214.3	214.3		37%	37%		7.14	7.14
Skok Muol		33.2	33.2		6%	6%		1.11	1.11
Total		582.3	582.3		100%	100%		19.41	19.41

3.6.8. Fish Catch, Abundance, CPUE in Dec 2022 in Srae Sranok Village

In December 2022, data was collected in Srae Sranok to assess the fish catch, relative abundance, and CPUE (Catch Per Unit Effort). The data for the different metrics are as follows:

Fish Catch: The total volume of fish caught in Srae Sranok during December was recorded as 264.1 grams. This represents the combined weight of all fish species caught during that period.

Relative Abundance: The relative abundance of fish species in Srae Sranok in December was determined. The data shows that ChraKeng had a relative abundance of 38%, Chveat had a relative abundance of 23%, Kmann had a relative abundance of 20%, Kompleanh had a relative abundance of 6%, Konhchos had a relative abundance of 8%, and Kranh had a relative abundance of 6%.

CPUE: The CPUE was measured to determine the productivity of fishing efforts in Srae Sranok. The CPUE for all fish species combined was recorded as 8.80 grams per hour. This indicates the average amount of fish caught per hour of fishing effort for the entire fish population in the area. Additionally, the CPUE for each individual fish species was recorded, with ChraKeng, Chveat, Kmann, Kompleanh, Konhchos, and Kranh having CPUE values of 3.34, 1.99, 1.76, 0.52, 0.69, and 0.50 grams per hour respectively.

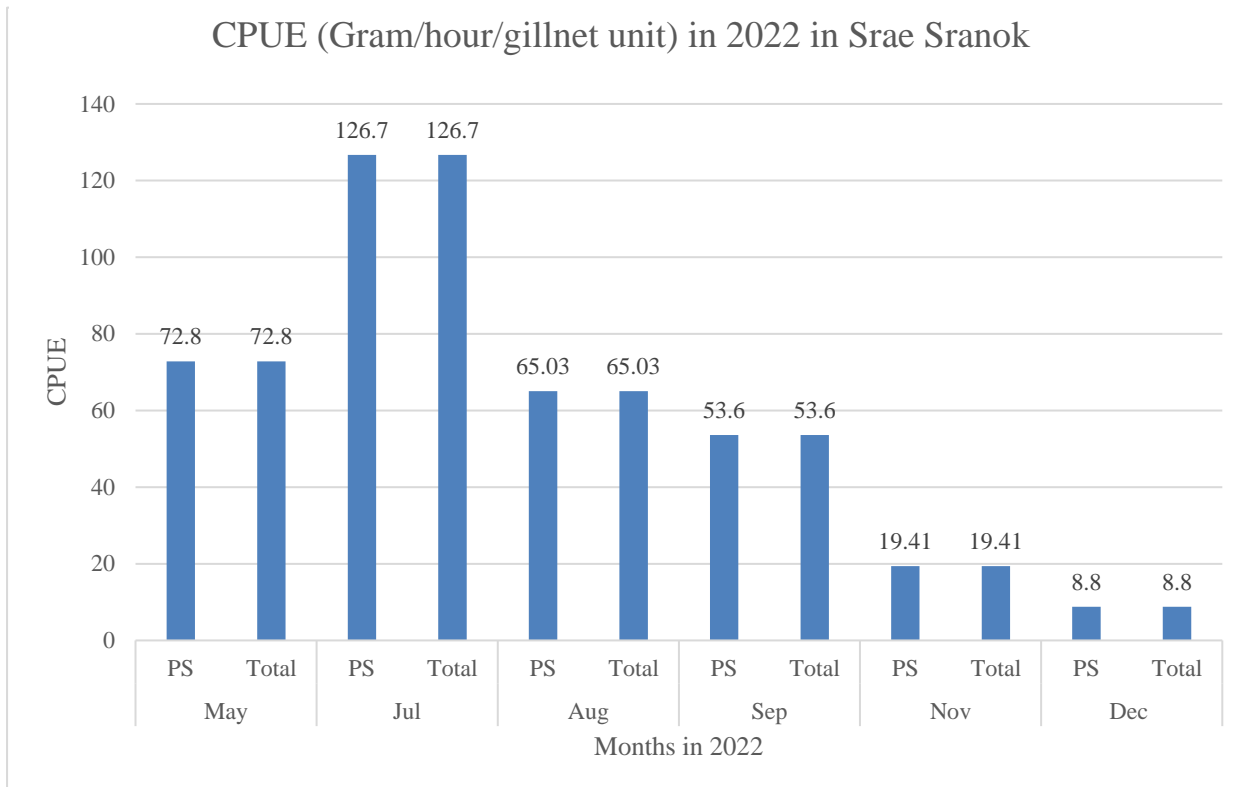
Table 56: Fish Catch, Abundance, CPUE in Dec 2022 in Srae Sranok

Fish Species	Dec								
	Fish Catch (g)			Relative Abundance			CPUE (gram/hour)		
	CS	PS	Total	CS	PS	Total	CS	PS	Total
ChraKeng		100.1	100.1		38%	38%		3.34	3.34
Chveat		59.7	59.7		23%	23%		1.99	1.99
Kmann		52.8	52.8		20%	20%		1.76	1.76
Kompleanh		15.7	15.7		6%	6%		0.52	0.52
Konhchos		20.7	20.7		8%	8%		0.69	0.69
Kranh		15.1	15.1		6%	6%		0.50	0.50
Total		264.1	264.1		100%	100%		8.80	8.80

3.6.9.3.5.9. CPUE by Month 2022 in Srae Sranok Village

In Srae Sranok, the CPUE (Catch Per Unit Effort) values were monitored in the project site (PS) over a six-month period, providing insights into the fishing productivity during different months. In May, the CPUE was 72.8, indicating a moderate catch rate. In July 2022, it showed a significant increase in CPUE to 126.7, suggesting a higher catch rate during that month. However, in August, the CPUE dropped to 65.03, indicating a decrease in fishing productivity. September recorded a further decline in CPUE to 53.6, indicating a lower catch rate compared to the previous month. In November, the CPUE dropped significantly to 19.41, representing a significant decrease in catch rate. Finally, in December, the CPUE reached its lowest value at 8.80.

Figure 5: CPUE by Month 2022 in Srae Sranok Village



4. CONCLUSION AND RECOMMENDATION

4.1. Conclusion

In conclusion, the CPUE (Catch Per Unit Effort) values in Kang Speu's project site (PS) showed variations throughout the months of August to December 2022. The CPUE values were generally lower in the PS compared to the control site (CS) for most months, indicating potentially lower fishing productivity in the project site.

The CPUE (Catch Per Unit Effort) values in Koah Snaeng for the months of May to December 2022 showed variations between the control site (CS) and the project site (PS). In most months, the CPUE values were higher in the CS compared to the PS, indicating potentially higher fishing productivity in the control site. However, in some months, such as September and November 2022, the CPUE values were higher in the PS.

In the control site analysis, the CPUE (Catch Per Unit Effort) values for the fish species Krabei Chrum showed fluctuations throughout the months. The CPUE ranged from 48.62 grams per hour in May to 8.22 grams per hour in December 2022. These variations suggest changes in fish abundance and fishing efficiency in the control site over time. In the project site analysis, the CPUE values for Krabei Chrum also exhibited variations during different months. The CPUE ranged from 29.08 grams per hour in May 2022 to 4.18 grams per hour in November 2022.

The CPUE (Catch Per Unit Effort) values for Krabei Chrum in the control site (CS) and the project site (PS) in Koah Snaeng varied for the months of May, July, August, September, November, and December in 2022. In most months in 2022, the CPUE values were higher in the CS compared to the PS, indicating potentially higher fishing productivity in the control site. However, in some months, such as September and November, the CPUE values were higher in the PS.

The CPUE (Catch Per Unit Effort) values for Samkhoy in the control site (CS) and the project site (PS) in Koah Snaeng showed variations for the months of February, March, July, August, September, October, and November in 2022. In most months in 2022, the CPUE values were higher in the CS compared to the PS, indicating potentially higher fishing productivity in the control site. However, in some months, such as August, September, and November in 2022, the CPUE values were higher in the PS.

The CPUE (Catch Per Unit Effort) values in Sdao 1 for the months of January, February, March, April, July, and August in 2022 showed variations in the control site (CS). The CPUE values were relatively high in January and February in 2022, with a slight decrease in March and April. In July and August, the CPUE values decreased significantly.

The CPUE (Catch Per Unit Effort) values for Srae Sranok in the project site (PS) in Sdao 1 showed variations for the months of May, July, August, September, November, and December in 2022. In most months, the CPUE values were relatively high, indicating potentially higher fishing productivity in the project site. However, in November and December, the CPUE values decreased significantly.

4.2. Recommendation

To address the gaps in the research, further fish monitoring (CPUE) should be conducted in the six villages of research sites. This will provide a more comprehensive understanding of fish abundance and fishing efficiency across a wider area.

Additionally, to accurately compare CPUE in the project site and control sites, it is important to ensure that the same gillnet fishing gear is used in both locations. This will help eliminate gear-specific biases and provide more reliable comparisons between the two sites.

Furthermore, the research conducted in 2022 only covered certain months, which may not represent the entire year. To overcome this limitation, further research should be conducted throughout the year to capture seasonal variations in fish abundance and fishing efficiency. This will provide a more complete picture of the dynamics and trends in CPUE over time.

Lastly, the absence of data in certain months highlights the need for further research to fill those gaps. Collecting data consistently throughout the year will help minimize data gaps and provide a more accurate assessment of CPUE variations.

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Annexes

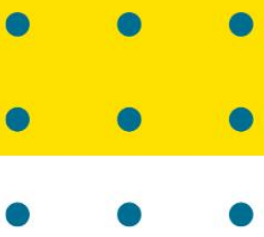
Annex 1: Local Names and Scientific Names of Fish

No	Local Name in Khmer	Local Name (Latin)	Scientific Names
1	អាចម៍រ្រើន (អាចម៍ស្នា)	Ach Chreun (Ach Svar)	
2	អាចម៍កុក	Ach Kok	<i>Dangila spilopleura</i>
3	អណ្តែងរឹង	An Deng Reung	<i>Clarias batrachus</i>
4	អណ្តែងទង់	An Deng Tun	<i>Clarias meladerma</i>
5	អណ្តាតឆ្កែ	Andat Chkae	<i>Achiroides melanorhynchus</i>
6	អង្កាច់សុស	Angkach Os	
7	អង្កាត់ប្រាក់	Angkat Prak	<i>Cyclocheilichthys microlepis</i>
8	អង្កាត់ស	Antung	<i>Ophichthus rutidoderma</i>
9	អង្កាត់	Antung	<i>Piscodonophis boro</i>
10	បរិល	Bor Bel	<i>Amphotistius imbricatus</i>
11	ចង្វា	Changva	<i>Opsarius koratensis</i>
12	ចង្វានរោង	Changva Nornong	<i>Lobocheilos melanotaenia</i>
13	ចង្វាមូល	Changva Muol	<i>Rasbora aurotaenia</i>
14	ចង្វាជញ្ជក់ (ប៉ាកក់)	Chanfgva Chhun Chuk (Pakok)	<i>Crossocheilus reticulatus</i>
15	ចង្វាផ្កាយក	Changva Pkachhouk	
16	ចង្វាអៀង	Changva Plieng	<i>Esomus longimanus</i>
17	ផ្កាមាត់	Chaoeng Moan	
18	ឆ្កោ	Chdor	<i>Channa micropeltes</i>
19	ចេកទុំ	Chek Tum	<i>Bagrichthys macracanthus</i>
20	ចេកទុំផ្លុក	Chek Tum Chnoat	<i>Nemacheilus longistriatus</i>
21	ឆ្កោក	Chkaok	<i>Cyclocheilichthys enoplos</i>
22	ឆ្កោកក្តារ	Chkaok Kdar (Chkaok?)	
23	ឆ្កោកមូល	Chkaok Muol	
24	ឆ្កោកអៀង	Chkaok Pleung	<i>Cyclocheilichthys furcatus</i>
25	ឆ្កោកពុកមាត់បី	Chkaok Pukmoat Bei	<i>Cyclocheilichthys heteronema</i>
26	ឆ្កាំង	Chlaing	<i>Hemibagrus nemurus</i>
27	ឆ្កាំងខ្មៅ (ខ្សាខ្មៅ)	Chlaing Kmao (Kya Kmao)	<i>Hemibagrus wyckii</i>
28	ឆ្កាំងក្រច	Chlaing Kroch	<i>Hemibagrus spilopterus</i>
29	ផ្កាផ្លុក	Chloanh Chnoat	<i>Macrognathus siamensis</i>

30	ឆកដប	Chnoc Dob	
31	ឆ្កិន	Chpin	<i>Hypsibarbus suvattii</i>
32	ឆ្កិនក្រហម	Chpin Krahorm	<i>Hypsibarbus wetmorei</i>
33	ឆ្កិនមាស	Chpin Meas	<i>Hypsibarbus sp. Cf. vernayi</i>
34	ឆ្កិនមូល	Chpin Muol?	<i>Hypsibarbus malcolmi</i>
35	ឆ្កិនប្រាក់	Chpin Prak	<i>Barbodes gonionotus</i>
36	ឆ្កិនធំ	Chpin Thom	
37	ឆ្កិន/ ឡូល	Chpin/Kyol	
38	ឆ្រកង	Chrakeng	<i>Scaphognathops stejneri</i>
39	ឈ្មក	Chveat	<i>Pangasius macronema</i>
40	កក	Ka Ok	<i>Arius caelatus</i>
41	កែ	Kae	<i>Pangasius conchophilus</i>
42	កើ	Ka-ei	
43	កែក	Ka-ek	<i>Labeo chrysophekadion</i>
44	កាវែរ(ក្រហម)	Kahaer (Krahorm)	<i>Barbonymus altus</i>
45	កាវែរលឿង	Kahaer Leung	<i>Barbonymus schwanefeldii</i>
46	កំបុកច្រមុះ	Kambot Chramos	<i>Sikukia gugerii</i>
47	កំភ្លាញដុក	Kamplanh Pluk	<i>Trichogaster microlepis</i>
48	កំភ្លាញស្រែ	Kamplanh Sre	<i>Trichogaster trichopterus</i>
49	កំភ្លៀវ	Kampliev	<i>Kryptopterus hexapterus</i>
50	កញ្ចប់ច្រែង	Kanchanchras	<i>Pseudambassis motitus</i>
51	កញ្ចុះ	Kanchos	<i>Mystus signaringan</i>
52	កញ្ចុះផ្កា	Kanchos Chnoat	<i>Mystus multiradiatus</i>
53	កញ្ចុះដី	Kanchos Chor	
54	កញ្ចុះក្បាង	Kanchos Kdong	<i>Heterobagrus bocourti</i>
55	កញ្ចុះខ្មៅ	Kanchos Kmao	
56	កញ្ចុះប៉ាក់	Kanchos Para	<i>Leiocassis siamensis</i>
57	កញ្ចុះស្រែ	Kanchos Sre	
58	កញ្ចុះស្ទឹង	Kanchos Stueng	
59	កញ្ចុះស្ទឹងកណ្តុរ	Kanchos Stueng Kandol	
60	កញ្ចក	Kanchrook	<i>Botia beauforti</i>
61	កញ្ចកក្រហម	Kanchrook Krahorm	<i>Botial modesta</i>

62	ក្រូកលៀង	Kanchrook Leung	<i>Botia lecontei</i>
63	ក្រូកដូត	Kanchrook Chnoat	<i>Botia helodes</i>
64	ក្រុងប្រេង	Kantrang Preng	<i>Parambassis wolffi</i>
65	ក្រូច	Kantrob	<i>Helostoma temmincki</i>
66	ក្រុយលៀង	Kantuy Loeung	
67	ក្រុយស្មើ	Kantuy Smeu	
68	ក្រុង	Kching	<i>Macrogathus maculatus</i>
69	កែស	Kes	<i>Kryptopterus micronema</i>
70	កែសក្រហម	Kes Krahorm	
71	កែសប្រាក់	Kes Prak	<i>Kryptopterus limpok</i>
72	ខ្លា	Kla	<i>Datnioides microlepis</i>
73	ភ្នំហាយ	Klainghay	<i>Belodontichthys dinema</i>
74	ខ្លា	Kmann	<i>Hampala macrolepidota</i>
75	ខ្លា (កំព, ស្នាមតម្កុក)	Kmann (Kam Phor, Snam Tam Bot)	<i>Hampala macrolepidota</i>
76	ខ្លាត្រាល់	Kmao Tpal	
77	ខ្លាដំរី	Knorng Veng	<i>Dangila lineata</i>
78	គល់ត្រិច	Kol Prich	<i>Neolissochilus soroides</i>
79	ក្របី (កន្ទួនដី)	Krabei (Kon Torn Dei)	<i>Bagarius bagarius</i>
80	ក្របីម	Kramorm	<i>Ampok bimaculatus</i>
81	ក្រាញ់ (ក្រែង)	Kranh (Sre)	<i>Anabas testudineus</i>
82	ក្រាម	Kray	<i>Chitala lopis</i>
83	ក្រែ	Kros	<i>Osteochilus hasselti</i>
84	ក្រែ	Krum	<i>Osteochilus melanopleurus</i>
85	ក្យា	Kya	<i>Hemibagrus wyckioides</i>
86	ក្យាខ្លា	Kya Kmao	
87	ក្យាក្រហម	Kya Krahorm	
88	លីញ	Linh	<i>Thynnichthys thynnoides</i>
89	លលកស/ក្រែភ្នំ	Lor Lork Sor	<i>Poropuntius deauratus</i>
90	នរោងដូត	Nonorng Chnoat	
91	នរោងវិញ	Nonorng Vinh	
92	ប៉ាហ្វីន (អាចម៍សត្វ)	Pa Phien (Ach Sat)	<i>Scaphognathops stejneri</i>
93	ប៉ាស៊ីធី	Pa See Ee	<i>Mekongina erythrospila</i>

94	ប៉ាវ៉ាមុកប៊ី	Pa Va Muk Pee	<i>Bangana behri</i>
95	ប្រម៉ា	Pama	<i>Bosemania microlepis</i>
96	ប៉ារ៉ា	Para	
97	ភ្នំកូរ	Pka Kor	<i>Cyclocheilichthys armatus</i>
98	បោ	Po	<i>Pangasius larnaudiei</i>
99	ប្រា	Pra	<i>Pangasianodon hypophthalmus</i>
100	ប្រាកណ្តុល	Pra Kandol	<i>Helicophagus waandersi</i>
101	ប្រួល ក្រឡង់	Pruol, Kralang	<i>Cirrhinus microlepis</i>
102	ភ្នំ រ៉ូស	Ptuok, Ros	<i>Channa striata</i>
103	រឿល	Riel	<i>Henicorhynchus caudimaculatus</i>
104	រឿល (រឿលតុប)	Riel (Riel Tob)	<i>Henicorhynchus ???</i>
105	រឿលអង្កាម	Riel Angkam	<i>Henicorhynchus cryptopogon</i>
106	រ៉ូមេស	Romeas	<i>Osphronemus exodon</i>
107	សំបកស្រូវឡៅ	Sambork Sralao	
108	សាងនរនាង	Sang Nor Noang	
109	ស្លាត	Slat	<i>Notopterus notopterus</i>
110	ស្លែកក្នុង	Sleuk Kduoch	
111	ស្លែកម្រស្សី	Sleuk Russey	<i>Longiculter siahi</i>
112	ស្នាក់/ ប៉ាកក់ (ត្រីបណ្ណាលស្នាក់)	Smok, Pa Kok	<i>Gyrinocheilus aymonieri</i>
113	ស្រកាភ្នំ	Sraka Kdam	<i>Cyclocheilichthys apogon</i>
114	ស្រកាភ្នំធំ	Sraka Kdam Thom	
115	ស្រកាណាក់	Sraka Neak	
116	តាឱន	Ta Oarn	<i>Ompok hypophthalmus</i>
117	ត្រាសាក់	Trasak	<i>Probarbus jullieni</i>
118	ទំពាក់ស្នា	Tumpok Sva	
	ភ្នំសំបែក	chpin sambet	



យកសំណាក

