



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



## Feed the Future Burma Fish for Livelihoods Project

Minimum dietary diversity for women survey



**USAID**



**WorldFish**



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### Authors

#### **Hsu Myat Nway**

Monitoring and Evaluation Coordinator  
WorldFish Myanmar

#### **Syed Aman Ali**

Monitoring Evaluation and Communications Specialist  
WorldFish Myanmar

#### **Quennie Vi Rizaldo**

Human Nutrition Specialist  
WorldFish Myanmar

### Editor

#### **Michael Akester**

Regional Director (Southeast Asia and Pacific)  
WorldFish

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## Feed the Future Burma Fish for Livelihoods Project

Capture fisheries are declining in Myanmar, yet fish makes up 60% of the population's animal-sourced food. To meet the growing demand for fish, aquaculture production is increasing. It is essential that Myanmar develops a sustainable aquaculture industry that minimizes potential environmental impacts and ensures that aquaculture practices are socially acceptable and economically sound. The Feed the Future Burma Fish for Livelihoods project (henceforth referred to as the *Activity*), funded by United States Agency for International Development (USAID), aims to increase fish production, labor productivity, food availability and fish consumption, especially for women and children from vulnerable households. It provides opportunities for entrepreneurial activities in small-scale aquaculture systems and promotes social behavioral change messages that direct home production and market purchases toward nutrition-conscious household decisions.

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## Contact

WorldFish Communications and Marketing Department, Jalan Batu Maung, Batu Maung, 11960 Bayan Lepas, Penang, Malaysia. Email: [worldfishcenter@cgiar.org](mailto:worldfishcenter@cgiar.org)

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## 1.Introduction

### 1.1 Background

In October 2019, the United States Agency for International Development (USAID) initiated the Feed the Future Burma, Fish for Livelihoods *Activity* for implementation over the period 2019-2027. The project will focus on improving the nutritional status of vulnerable households in Central and Northern Myanmar by promoting inclusive and sustainable aquaculture growth that focuses on small-scale farmers.

Part of the WorldFish mission in Myanmar focuses on Small-Scale Aquaculture (SSA) to promote the resilience and sustainability of aquaculture and integrated agriculture. WorldFish provides technical backstopping to the main field-based implementers namely: the Myanmar Fisheries Federation, Karuna Social Services Association, Ar Yone Oo, BRAC, Pekhoh Lake Committee, and Inle Lake Committee. The *Activity* also draws on the International Water Management Institute (IWMI) expertise, a sister CGIAR entity<sup>1</sup>.

The intervention will focus on five inland states and regions in Central and Northern Myanmar:

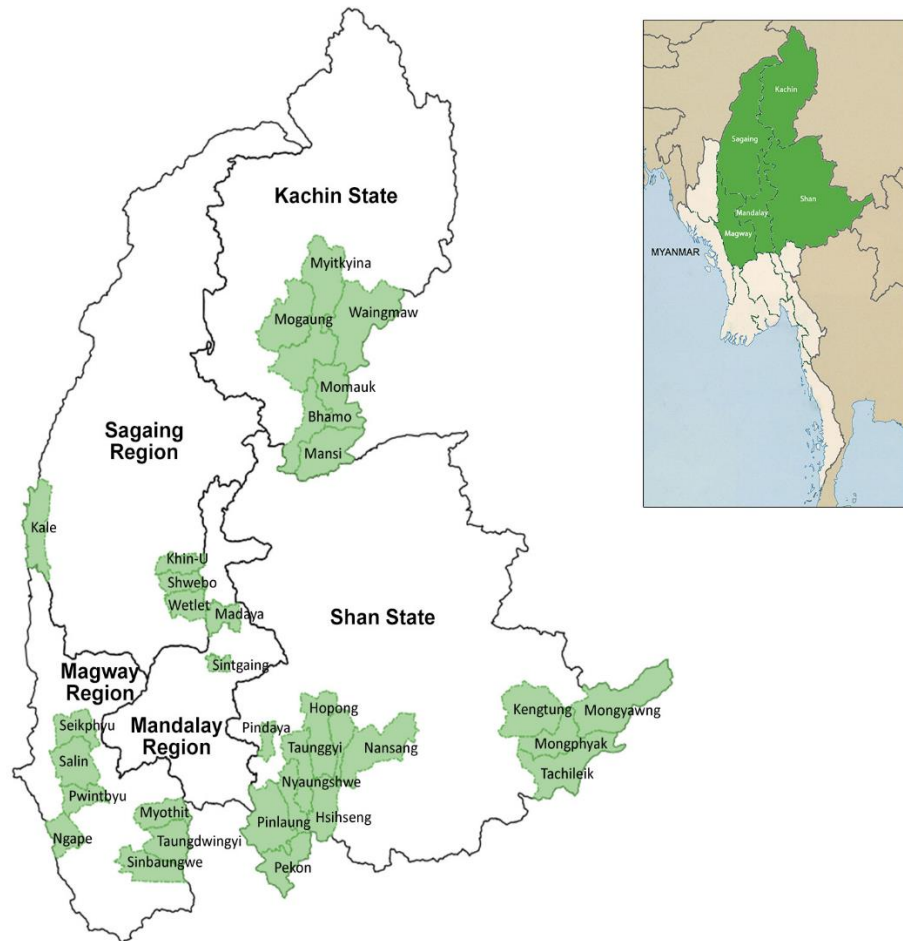
- Central Dry Zone: Mandalay, Magway, and Sagaing
- North and Eastern: Shan
- Kachin

These areas present more challenges to aquaculture development and livelihood opportunities. The growth in aquaculture can play an important role to change this scenario by increasing production and income opportunities. A scoping study was conducted and as a result, 36 Townships were selected in the 3 regions and 2 states in Myanmar.

Project Townships are Bhamo, Mogaung, Myitkyina, Waingmaw, Momauk, Mansi, Salin, Ngaphe, Myo Thit, Seik Phyu, Sinbaungwe, Taungdwingyi, Pwintphyu, Shwe Bo, Khin-U, Wetlet, Tigyaing, Kale, Madaya, Sintgaing, Patheingyi, Myittha, Sintgu, Tachileik (Tar Lay), Monghpyak, Keng Tung, Mongyawng, Pinlaung, Taunggyi, Pekon, Nansang, Loilen, Nyaung Shwe, Pindaya, Hopong and Hsihseng.

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<sup>1</sup> <https://www.cgiar.org/food-security-impact/one-cgiar/>



**Figure 1:** Townships where F4L operates in Burma

These areas present challenges for aquaculture development and livelihood opportunities. However, aquaculture growth can play an important role in changing this scenario by increasing production and income opportunities.

## 1.2 Objectives of the study

1. To determine the proportion of female participants consuming at least five food groups over a 24-hour period in Year 4 (2022-2023).
2. To determine the frequency of consumption of fish and fish-based processed products (FBPPs) among respondents over a 7-day period in Year 4 (2022-2023).
3. To determine who decides to harvest fish and manages income among the respondents' household in Year 4 (2022-2023).

## 2. Methodology

### 2.1 Sampling method

A total of 3,710 beneficiary households are participating in the *Activity*. Using systematic random sampling, 557 women aged 15-49 years from beneficiary households were selected, and 97% consented to become respondents for the survey. Below is the list of Townships per region/state.

State/ Region / Township	No. of Beneficiaries	No. of respondents
<b>Kachin</b>	<b>311</b>	<b>47</b>
Bhamo	42	6
Mansi	20	3
Mogaung	28	4
Momauk	19	3
Myitkyina	44	7
Waingmaw	158	24
<b>Magway</b>	<b>784</b>	<b>118</b>
Myothit	63	9
Ngape	108	17
Pwintbyu	162	24
Salin	430	65
Seikphyu	21	3
<b>Mandalay</b>	<b>230</b>	<b>35</b>
Madaya	230	35
<b>Sagaing</b>	<b>895</b>	<b>134</b>
Khin-U	210	32
Shwebo	450	68
Wetlet	235	34
<b>Shan (East)</b>	<b>395</b>	<b>59</b>
Kengtung	163	24
Monghpyak	58	9
Tachileik	174	26
<b>Shan (South)</b>	<b>1095</b>	<b>150</b>
Hopong	42	6
Hsihseng	34	5
Nansang	262	39
Nyaungshwe	74	11
Pekon	262	38
Pindaya	125	20
Pinlaung	96	1
Taunggyi	200	30
<b>Grand Total</b>	<b>3710</b>	<b>543</b>

**Table 1.** List of Respondents in each Township.

## 2.2 Interview technique and survey tool

The survey used a 24-hour dietary recall and a 7-day recall on consumption of fish and fish-based processed products (FBPPs). The survey utilized the minimum dietary diversity for women of reproductive age (MDD-W) score as described in the Minimum Dietary Diversity for Women: A Guide for Measurement by the Food and Agriculture Organization and FHI 360 in 2016 and updated in 2021. This is a score of 5 out of 10 food groups that is used as a proxy indicator to reflect micronutrient adequacy.

From the guide, 22 different food groups are cited, then aggregated to 10 food groups as below (Annex 1), which have a strong correlation to micronutrient sufficiency:

1. grains, white roots and tubers, and plantains
2. pulses (beans, peas and lentils)
3. nuts and seeds
4. dairy products
5. meat, poultry and fish
6. eggs
7. dark green leafy vegetables
8. other vitamin A-rich fruits and vegetables
9. other vegetables
10. other fruits

Other food categories were not included in calculating the total MDD-W score.

## **2.3 Enumerator training**

All enumerators for the survey were field staff from project partners and they were trained online for a full day on how to conduct the survey at the field level by WorldFish's Monitoring and Evaluation Coordinator. The training covered the following topics:

- operational definitions of “women of reproductive age,” “dietary diversity” and “minimum dietary diversity for women MDD-W”
- reasons for focusing on the dietary diversity of women
- 10 food groups that comprise the MDD-W indicator
- research design
- explain questionnaire for MDD-W
- sampling method
- mobile data collection method using KoBo software.

A total of 41 (M-24, F-17) individuals participated in the online training, 40 from Feed the Future Burma Fish for Livelihoods Project partners and 01 external enumerator: (6) Eastern Shan, (5) Kachin, (10) Magway, (6) Sagaing, (4) Mandalay, (9) IP staff and (1) Southern Shan.

## **2.4 Data collection**

The survey was conducted from 22 May to 12 June 2023, whenever possible, the enumerators conducted face-to-face interviews. When this was not possible, because of restrictions imposed by local authorities, phone interviews were used. Collected data was entered directly into Android mobile phones with the open-source software KoBo (<https://www.kobotoolbox.org/>).

When enumerators had internet access, the data was uploaded to the server in the evening. The exceptions were in Hopong, Hsihseng, Shwebo and Wetlet Townships, where internet connectivity was poor. In those townships, data was collected on paper and then encoded to the Kobo software the next day. The majority of the interviews were done in Burmese, while the rest were done in local languages, Kayan and Akha for Pinlaung, Shan for Tachileik and Kachin for Waingmaw. The enumerators reached 97 % of the respondents while 3% were not surveyed due to the ongoing conflicts in the area.



### 3. Profile of respondents

#### 3.1 Age and educational attainment

Many of the respondents are in the age range 25-35 years old (35%) and 36-45 (33%) years old. Regarding level of education, 30% of respondents received secondary education and 26 % have higher education (Figure 2).

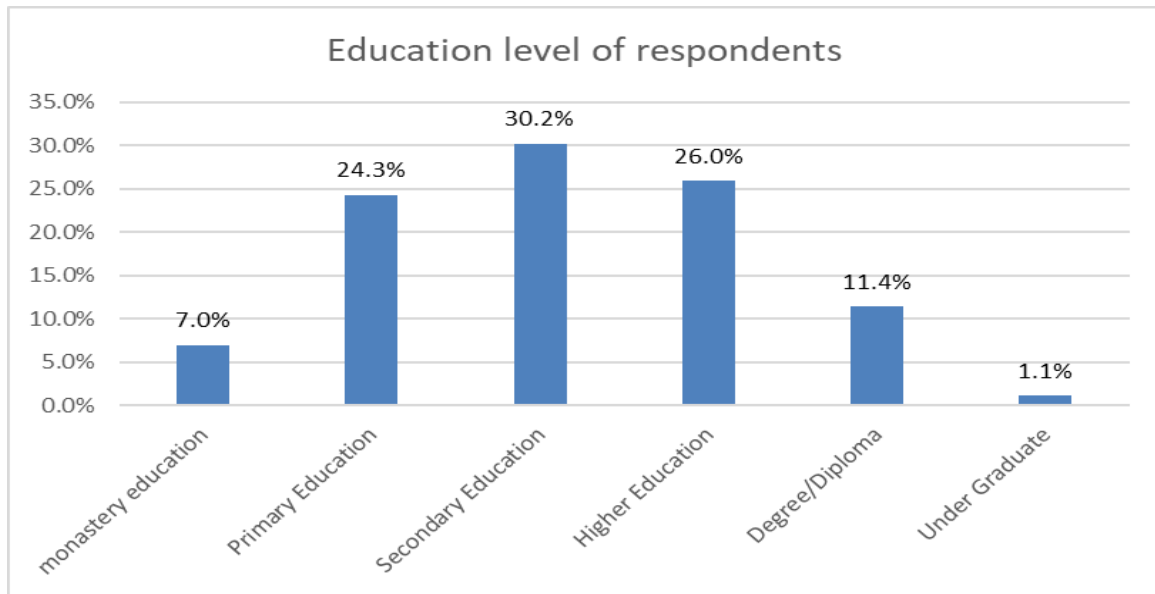


Figure 1. Education level of respondents.

#### 3.2 Marital status

Figure 3 shows that about 80% of the respondents are married and 18% are single (never married). For Myothit, Nansang, Pinlaung and Seikphyu Townships, all respondents are married, while half of respondents in Myitkyina and Mogaung Townships are single.

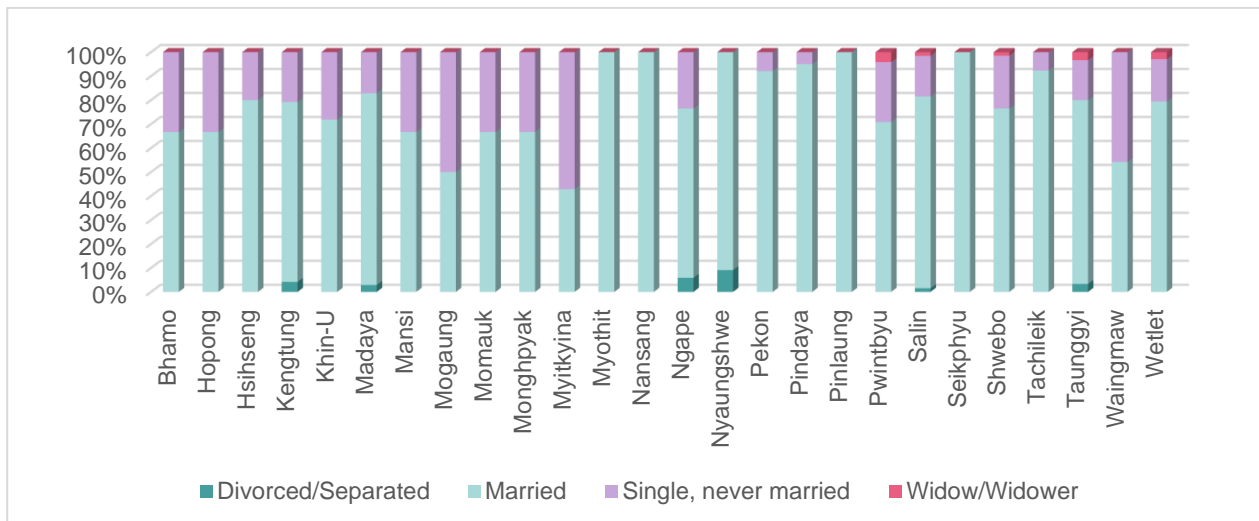


Figure 2. Marital status of respondents.

### 3.3 Status of stocking fish fingerlings and harvesting fish

The *Activity* promotes using integrated farming systems. This approach provides income and ensures the availability of diverse food for consumption among women of reproductive age. This includes fish, which is an important source of animal protein and micronutrients.

When culturing fish, proper stocking and management are important. During the survey period, not all respondent households harvested fish that were stocked during the first production cycle. This was due to a variety of reasons, including fish being too small for sale as well as low market prices.

According to Table 2, all farmer households in the 26 townships had stocked fish fingerlings in their homestead ponds, but only 90% were able to harvest.

Farmers in Mogaung, Monghpyak and Tachileik Townships have very low number of farmers who harvested the fish during the survey, it is assumed that the rest of the farmers harvested their ponds in July onwards when the survey was completed.

Township	Did your household stock fingerlings in previous year?	If Yes, have your household harvested fingerlings?
Bhamo	100%	83%
Hopong	100%	83%
Hsihseng	100%	100%
Kengtung	100%	83%
Khin-U	100%	100%
Madaya	100%	67%
Mansi	100%	100%
Mogaung	100%	25%
Momauk	100%	100%
Monghpyak	100%	25%
Myitkyina	100%	67%
Myothit	100%	100%
Nansang	100%	100%
Ngape	100%	100%
Nyaungshwe	100%	100%
Pekon	100%	86%
Pindaya	100%	100%
Pinlaung	100%	100%
Pwintbyu	100%	100%
Salin	100%	100%
Seikphyu	100%	100%
Shwebo	100%	99%
Tachileik	100%	30%
Taunggyi	100%	83%
Waingmaw	100%	100%
Wetlet	100%	100%
Total	100%	90%

**Table 2.** Stocking and harvesting status.

## 4. Survey results

### 4.1 24-hour food recall

#### Dietary score of women of reproductive age

Overall, 55% of the respondents achieved an MDD-W score of at least five food groups (Table 3) which is lower than the previous year by 24%, this can be due to the unaffordability of common food items in the country and the ongoing conflicts in few of the surveyed townships. It is remarkable that all the respondents in Myothit Township achieved >5 scores, conversely no respondents from Hsisheng and Pinlaung Townships reached the cut off points.

Townships	MDD-W Score/10	Total who consumed <5 food Group	Total who consumed ≥5 food Group
Bhamo	4.2	67%	33%
Hopong	4.5	67%	33%
Hsisheng	3.8	100%	0%
Kengtung	5.9	21%	79%
Khin-U	4.0	75%	25%
Madaya	4.6	49%	51%
Mansi	4.7	33%	67%
Mogaung	4.3	75%	25%
Momauk	5.0	33%	67%
Monghpyak	5.9	11%	89%
Myitkyina	4.1	71%	29%
Myothit	7.1	0%	100%
Nansang	4.7	41%	59%
Ngape	4.8	24%	76%
Nyaungshwe	5.7	18%	82%
Pekon	4.0	68%	32%
Pindaya	5.1	50%	50%
Pinlaung	4.0	100%	0%
Pwintbyu	4.3	58%	42%
Salin	4.4	54%	46%
Seikphyu	4.7	33%	67%
Shwebo	5.4	21%	79%
Tachileik	4.8	46%	54%
Taunggyi	5.1	37%	63%
Waingmaw	4.5	46%	54%
Wetlet	4.6	47%	53%
<b>All Township</b>	<b>4.8</b>	<b>45%</b>	<b>55%</b>

**Table 3.** Mean MDD-W score and percentage of respondents achieving at least five food groups.

Of all the food groups consumed, rice, the staple food in Myanmar diets is widely consumed in the survey areas, apart from Tachileik Township where 8% of respondents did not consume rice during the data collection.

Surprisingly, food group 5 consisting of meat, poultry and fish is the second most consumed food contrary to reports (MAPSA, 2023) that people forego animal source foods during this period because it is unaffordable, only respondents from Pwintpbyu and Salin Townships, with 8% and 5% respectively did not eat animal source foods.

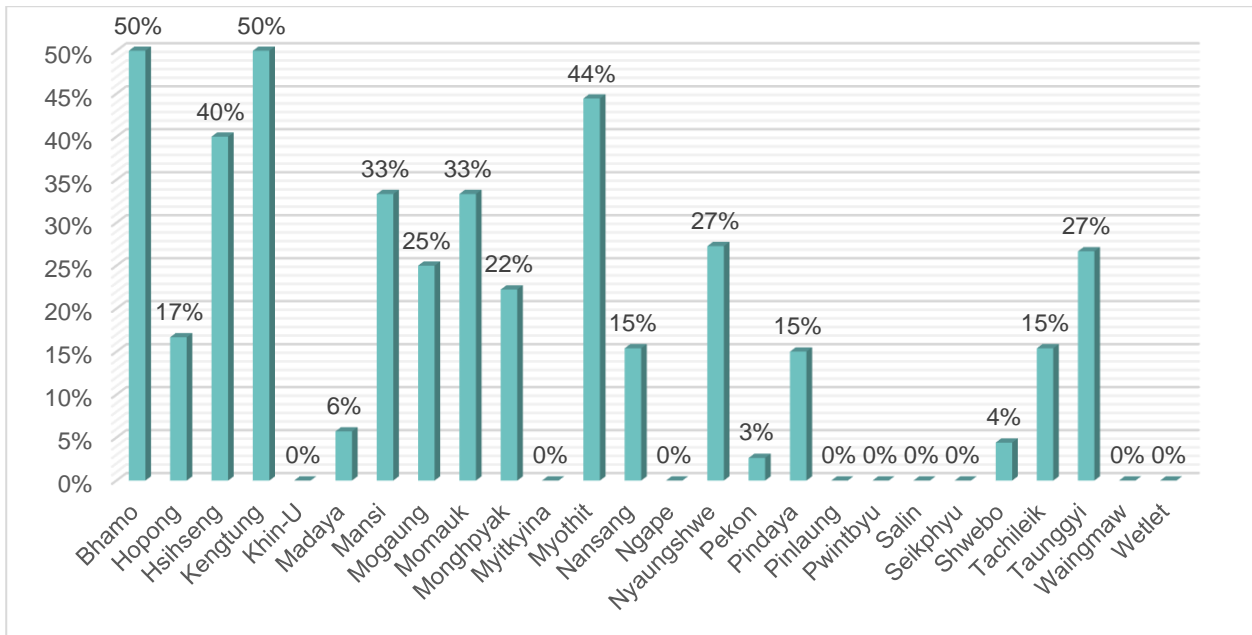
The least food groups consumed are milk and milk products, followed by nuts and seeds, eggs and other fruits. Table 4 shows the most and the least consumed food groups.

Food group	Percentage	Rank
Food Group 1: Grains, white roots and tubers or plantains	99.4	1
Food Group 5: Meat, poultry and fish	99.1	2
Food Group 9: Other vegetables	62.1	3
Food Group 7: Dark green leafy vegetables	60.8	4
Food Group 8: Vitamin A-rich vegetable and fruits	46.6	5
Food Group 2: Beans and peas	37.8	6
Food Group 10: Other fruits	31.9	7
Food Group 6: Eggs	26.5	8
Food Group 3: Nuts and seeds	10.5	9
Food Group 4: Milk and milk products	2.8	10

**Table 4.** Food consumption ranked from highest to lowest.

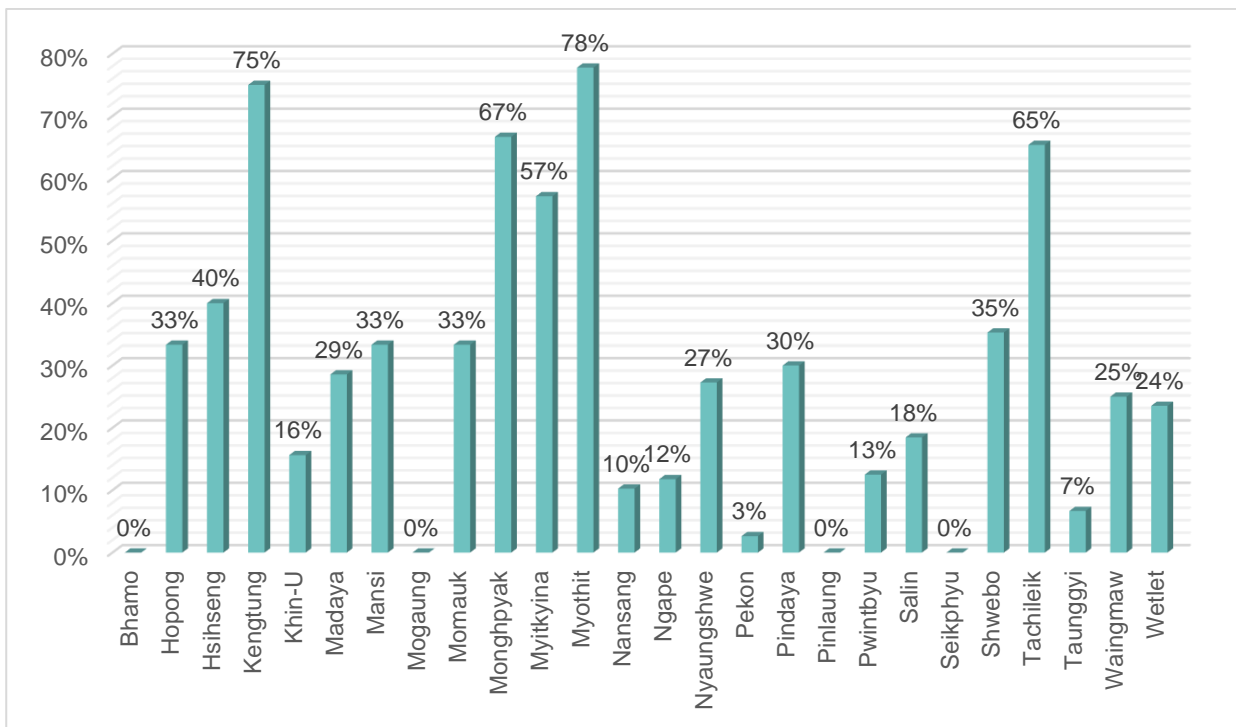
Looking closely at the least consumed food groups, for milk and milk products, the results are not surprising since Myanmar people do not have the habit of consuming milk. Although they drink tea with milk (lah-phat-yay) usually the milk used is sweetened/condensed milk which is high in sugar and not fresh milk. In the majority of the surveyed townships (65%) did not have respondents who consumed milk and milk products, with the exception of Pindaya Township where 35% of respondents reported consumption preceding the survey.

For the consumption of nuts and seeds (Figure 4), 35% of the townships surveyed have no respondents who consumed the food group. These are townships mostly in the Central Dry Zone area which is surprising since the food is produced here. However, it can be assumed that due to ongoing conflicts, it might affect their ability to access the food.



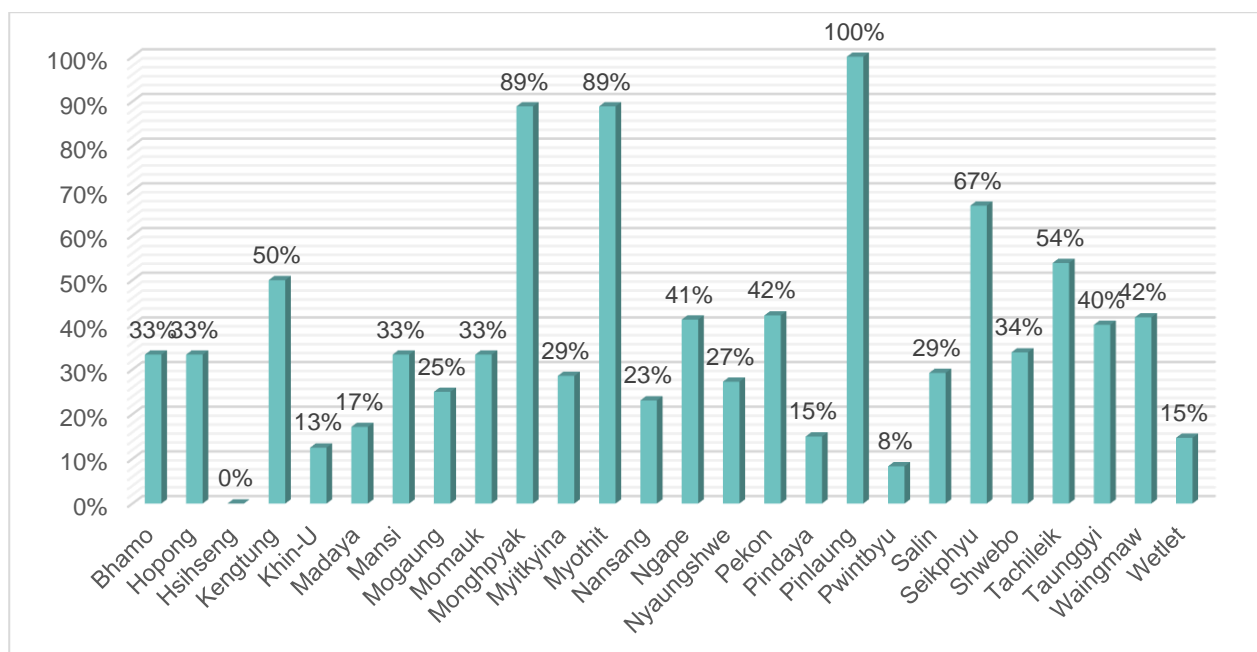
**Figure 3.** Percentage of women consuming items from Food Group 3 (nuts and seeds).

Figure 5 for eggs, 5 out of 26 townships have more than 50% of the respondents to include eggs in their diets preceding the survey. While only six townships reported <10% and no egg consumption.



**Figure 4.** Percentage of women consuming eggs.

Figure 6 finally, for other fruits, respondents from every township consumed except for Hsihseng Township. All respondents from Pinlaung Township reported to consume the food group.



**Figure 5.** Percentage of women consuming other fruits.

#### 4.2. Fish consumption over the previous 7 days

All respondents reported the consumption of fish in the previous 7 days before the survey. Of those, the average number of meals containing fish was 5 (Table 5). Nyaungshwe Township had the highest average meals of 10.

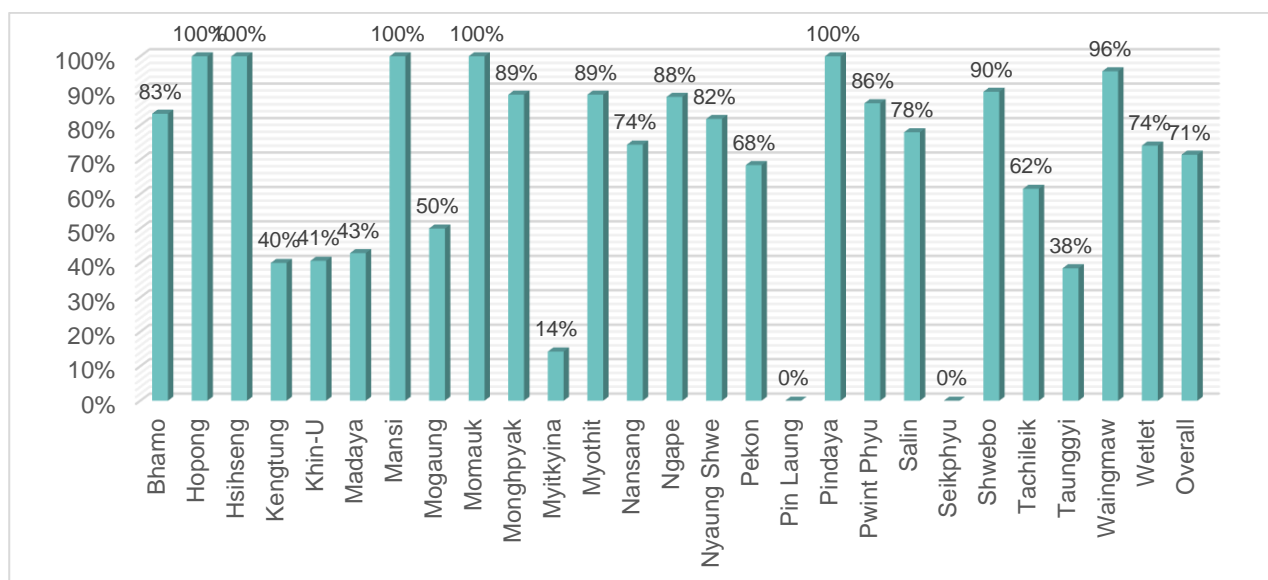
Township	Average # of meals containing fish	Min # of meals containing fish	Max # of meals containing fish
Bhamo	6.7	2	15
Hopong	3.3	3	4
Hsihseng	4.8	3	6
Kengtung	2.4	0	7
Khin-U	5.4	1	14
Madaya	4.9	2	10
Mansi	3.7	3	4
Mogaung	5.0	4	6
Momauk	5.7	2	10
Monghpyak	6.1	2	14
Myitkyina	3.6	2	5
Myothit	6.0	3	12
Nansang	5.6	2	18
Ngape	7.9	2	21
Nyaung Shwe	10.5	4	21

Township	Average # of meals containing fish	Min # of meals containing fish	Max # of meals containing fish
Pekon	3.9	1	10
Pin Laung	5.0	5	5
Pindaya	6.7	2	19
Pwint Phyu	4.5	0	10
Salin	5.4	0	15
Seikphyu	0.7	0	1
Shwebo	5.2	2	10
Tachileik	3.8	1	10
Taunggyi	4.3	0	10
Waingmaw	4.5	0	9
Wetlet	4.1	0	10
<b>Grand Total</b>	<b>5.0</b>	<b>0</b>	<b>21</b>

**Table 5.** Number of meals containing fish in the previous 7 days.

### 4.3 Consumption of Small Indigenous fish Species (SIS) over the previous 7 days

A total of 370 respondents (71%) said that they had consumed SIS in the previous 7 days. All respondents from Hopong, Hsisheng, Mansi, Momauk and Pindaya Townships reported the consumption of SIS (Figure 7). For those who reported consumption, the average number of meals was 2.6 (Table 6).



**Figure 6.** Percentage of respondents who had consumed SIS.

Township	Average # of meals containing SIS	Min # of meals containing SIS	Max # of meals containing SIS
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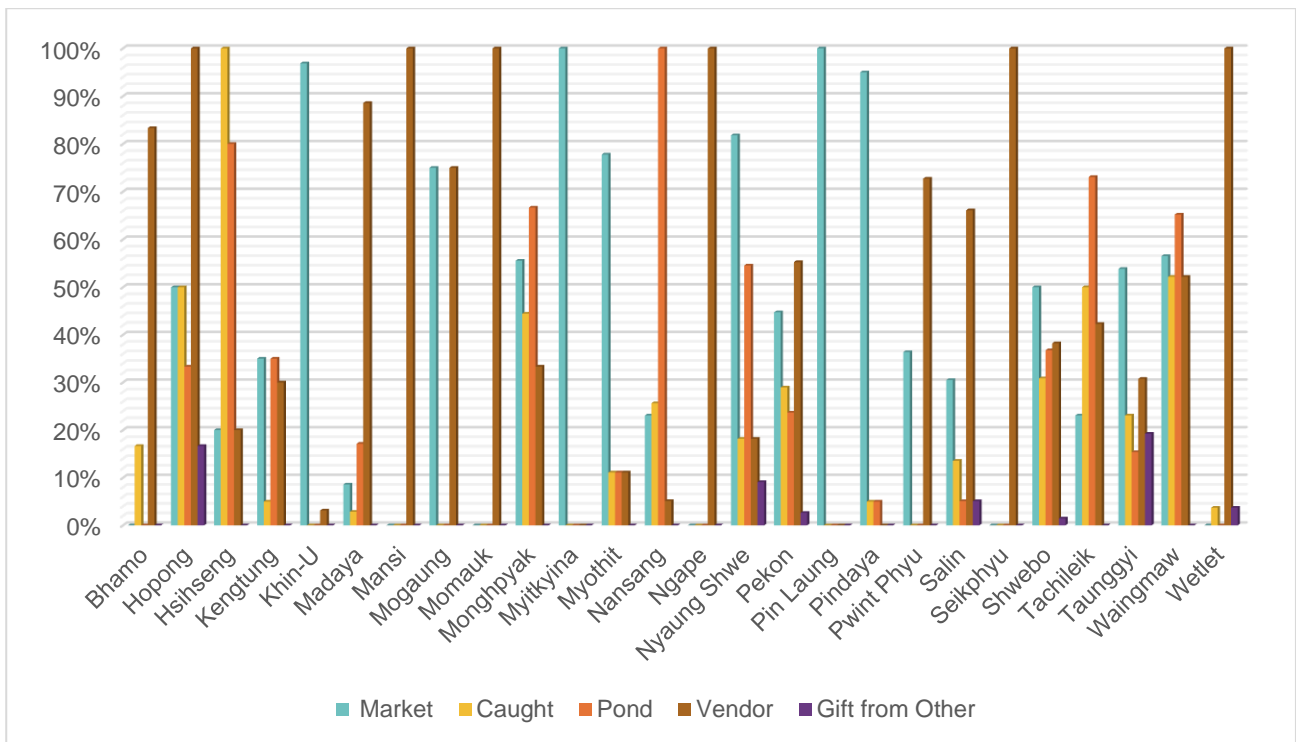
Bhamo	2.5	0	7
Hopong	2.2	1	3
Hsihseng	4.4	3	6
Kengtung	0.7	0	2
Khin-U	1.4	0	6
Madaya	1.6	0	6
Mansi	1.0	1	1
Mogaung	4.8	0	18
Momauk	2.0	1	3
Monghpyak	3.3	0	14
Myitkyina	0.1	0	1
Myothit	5.6	0	12
Nansang	1.6	0	8
Ngape	5.5	0	21
Nyaung Shwe	4.5	0	15
Pekon	1.5	0	8
Pin Laung	0.0	0	0
Pindaya	6.2	1	21
Pwint Phyu	2.2	0	6
Salin	3.4	0	14
Seikphyu	0.0	0	0
Shwebo	2.5	0	7
Tachileik	2.0	0	8
Taunggyi	1.2	0	6
Waingmaw	3.3	0	8
Wetlet	3.6	0	10
<b>Total</b>	<b>2.6</b>	<b>0</b>	<b>21</b>

**Table 6.** Meals containing SIS.

#### 4.4 Source of fish

Overall, respondents rely on buying fish from ambulant vendors (47%) and the market (42%), followed by harvesting from their own pond (28%). The lowest percentages were catching fish from the wild (19%) and receiving gifts (3%). In Nansang, specifically, respondents rely mostly on their own ponds for their source of fish, while respondents from Hopong, Ngape, Seikphyu, Wetlet, Mansi and Momauk Townships depend on ambulant vendors (Figure 16).

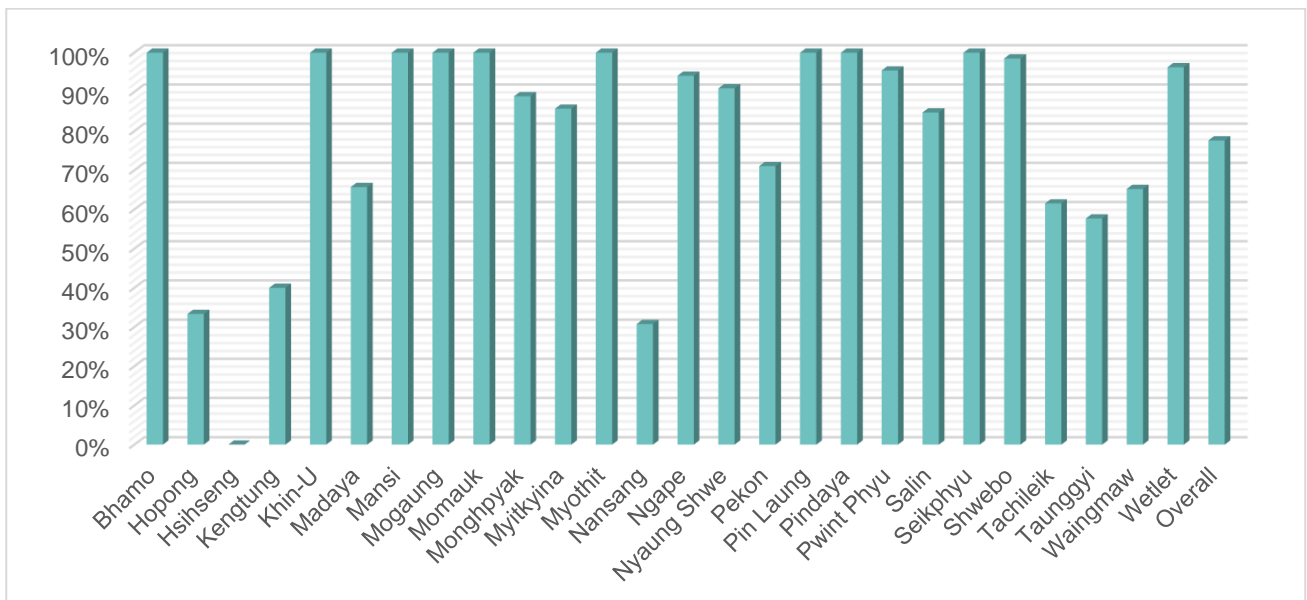




**Figure 7.** Sources of fish.

#### 4.5. Consumption of fish-based processed products over the previous 7 days

Overall, 78% of the respondents said that they had consumed FBPPs e.g. dried fish and shrimp, fish paste, pickled fish (fermented fish with rice traditionally wrapped in leaves), smoked fish, and salted fish over the previous 7 days. All the respondents from Bhamo, Mansi, Mogaung, Momauk, Khin-U, Myothit, Pinlaung, Pindaya and Seikphyu Townships reported consuming these products. While respondents from Hsihseng Township did not consume any fish based processed products (Figure 9).



**Figure 8.** Percentage of respondents consuming FBPPs.

For 402 respondents who consumed FBPPs, the average number of meals that contained FBPPs was 5. Khin-U has the highest average, at 26 (Table 7).

Township	Average # of meals containing FBPPs	Minimum # of meals containing FBPPs	Maximum # of meals containing FBPPs
Bhamo	1.8	1	3
Hopong	1.5	1	2
Kengtung	1.5	1	2
Khin-U	11.7	1	20
Madaya	3.5	1	12
Mansi	2.7	2	4
Mogaung	4.3	3	8
Momauk	3.3	1	7
Monghpyak	3.6	1	14
Myitkyina	3.3	2	5
Myothit	4.2	1	7
Nansang	1.5	1	2
Ngape	9.4	3	14
Nyaung Shwe	3.4	2	6
Pekon	2.7	1	8
Pin Laung	1.0	1	1
Pindaya	7.3	2	21
Pwint Phyu	3.7	1	10
Salin	3.7	1	14
Seikphyu	3.5	1	6
Shwebo	5.6	1	12
Tachileik	4.8	1	16
Taunggyi	2.5	1	7
Waingmaw	7.2	1	11
Wetlet	4.3	2	10
<b>Grand Total</b>	<b>5.0</b>	<b>1</b>	<b>21</b>

**Table 7.** Meals containing FBPPs.

The most popular FBPPs were dried fish (76%) and fish paste (70%). All the respondents from Hopong, Khin-U, Mansi, Myothit, Pwintbyu and Seikphyu reported consuming dried fish, while in Pinlaung, all respondents consumed only fish paste. (Table 8).

Township	Dried fish	Fish paste	Picked fish (fermented fish with rice)	smoked fish
Bhamo	83%	33%	33%	0%
Hopong	100%	0%	0%	0%
Kengtung	75%	38%	0%	0%
Khin-U	100%	97%	6%	0%
Madaya	91%	35%	4%	0%
Mansi	100%	67%	33%	0%
Mogaung	75%	100%	25%	0%
Momauk	67%	33%	33%	0%
Monghpyak	38%	50%	50%	0%

Township	Dried fish	Fish paste	Picked fish (fermented fish with rice)	smoked fish
Myitkyina	17%	100%	67%	0%
Myothit	100%	100%	0%	0%
Nansang	75%	33%	17%	0%
Ngape	38%	100%	0%	0%
Nyaung Shwe	30%	100%	0%	10%
Pekon	67%	74%	0%	0%
Pin Laung	0%	100%	0%	0%
Pindaya	95%	70%	35%	0%
Pwintbyu	100%	38%	0%	0%
Salin	92%	44%	2%	0%
Seikphyu	100%	0%	0%	0%
Shwebo	70%	97%	0%	0%
Tachileik	56%	50%	44%	0%
Taunggyi	73%	13%	0%	0%
Waingmaw	67%	93%	27%	53%
Wetlet	73%	100%	8%	62%
<b>Total</b>	<b>76%</b>	<b>70%</b>	<b>10%</b>	<b>6%</b>

**Table 8.** Types of FBPs consumed.

#### 4.6. Use of fish after harvest

Respondents reported multiple ways of using the fish they harvested from their homestead ponds (Table 9). Overall, 99% consume the fish that they harvested, 84% sell the fish and 83% give some of them away. A few respondents sell fish on credit to others. In addition, in the majority of the townships (92%), respondents indicated that different portions of the harvest are sold, consumed and gifted. Mansi indicated that they sold and consumed their harvested fish while Pinlaung only consumed and gifted their harvest.

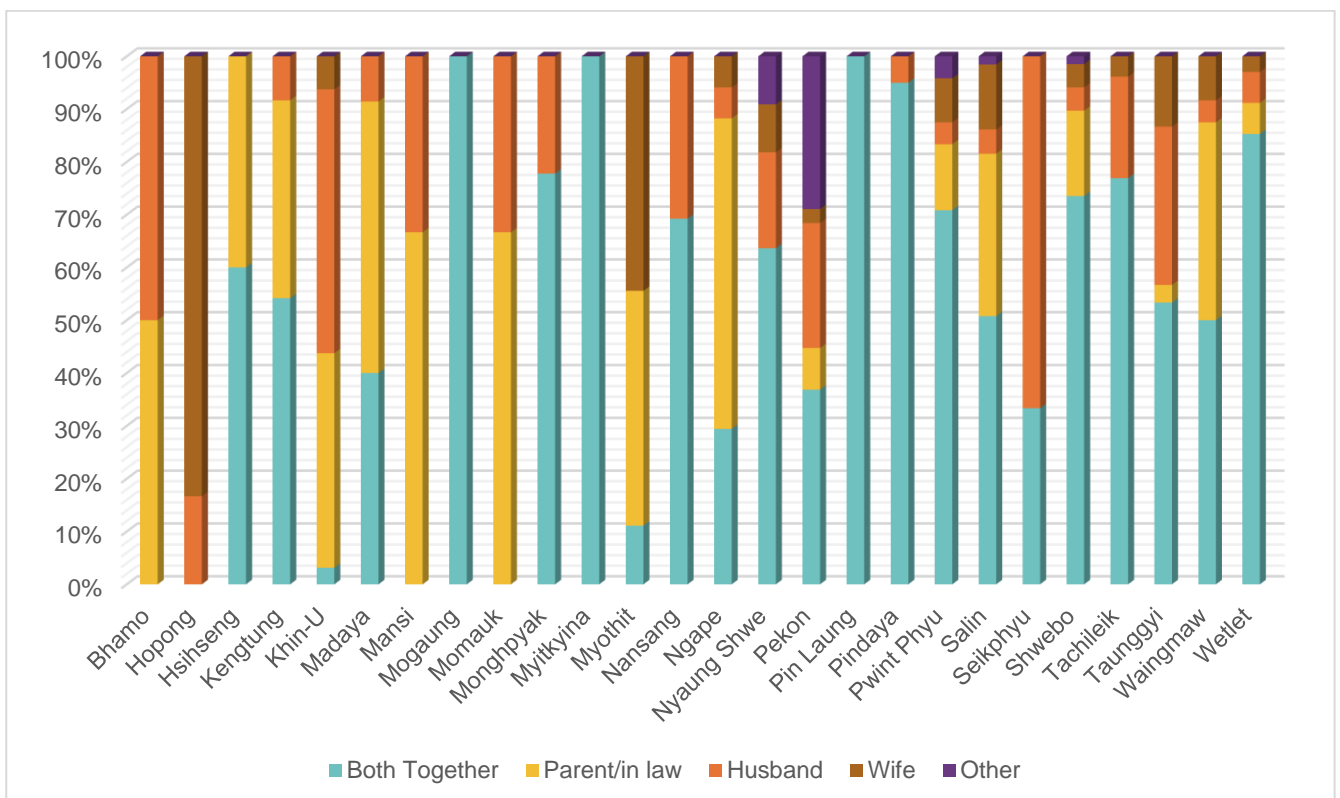
Township	Sold	Consumed	Gifted
Bhamo	100%	83%	33%
Hopong	83%	100%	67%
Hsihseng	100%	100%	100%
Kengtung	58%	100%	50%
Khin-U	100%	100%	97%
Madaya	100%	100%	97%
Mansi	100%	100%	0%
Mogaung	100%	75%	75%
Momauk	100%	100%	67%
Monghpyak	11%	100%	89%
Myitkyina	43%	100%	43%
Myothit	78%	100%	33%
Nansang	100%	100%	69%
Ngape	88%	88%	82%
Nyaung Shwe	100%	100%	100%

Township	Sold	Consumed	Gifted
Pekon	47%	100%	50%
Pin Laung	0%	100%	100%
Pindaya	85%	100%	80%
Pwint Phyu	96%	100%	100%
Salin	97%	100%	95%
Seikphyu	100%	100%	100%
Shwebo	100%	99%	97%
Tachileik	54%	100%	73%
Taunggyi	27%	100%	83%
Waingmaw	100%	100%	100%
Wetlet	100%	100%	100%
<b>Total</b>	<b>84%</b>	<b>99%</b>	<b>83%</b>

**Table 9.** Usage of fish after harvest.

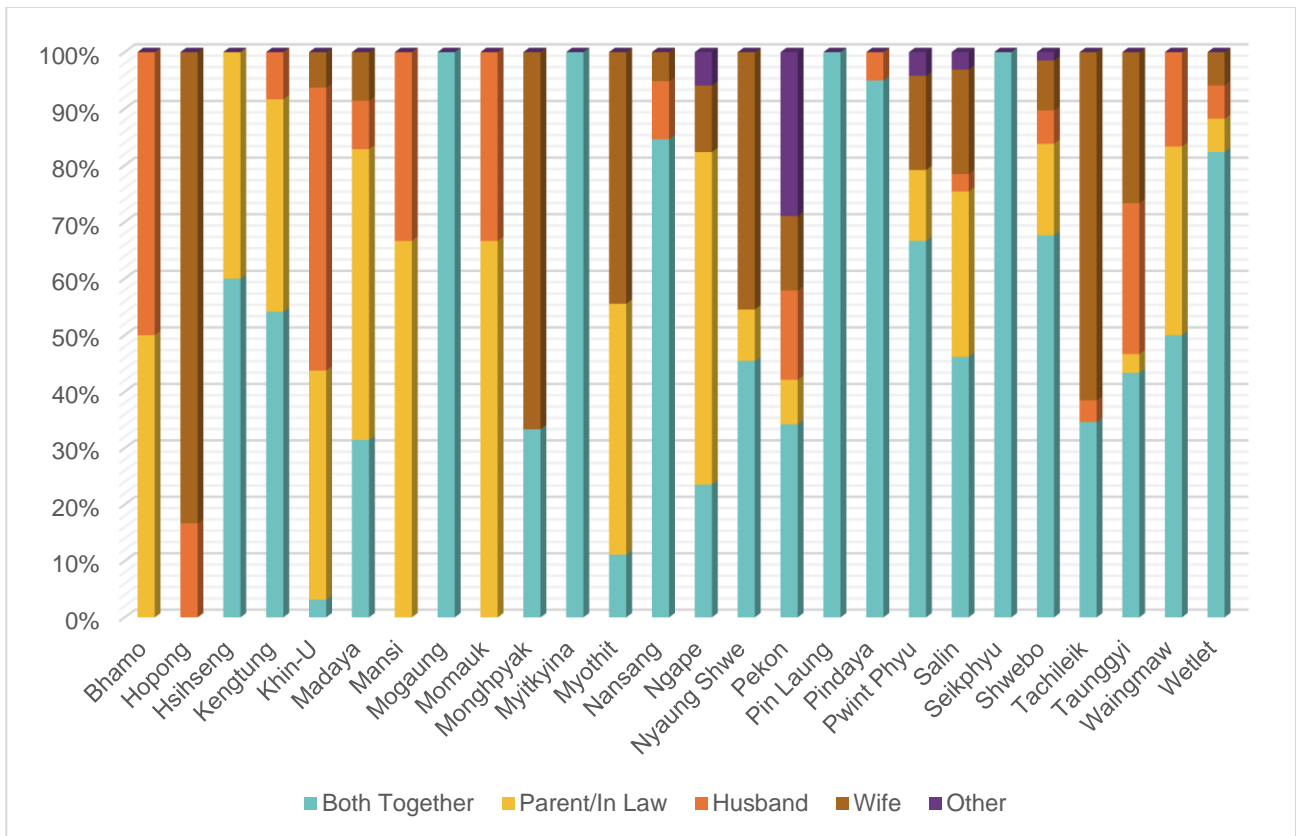
#### 4.7. Decision-makers after harvest

During the survey, respondents were asked who decides on what to do with the fish they harvest—whether to sell or consume. A total of 55% of respondents said that husbands and wives decided together, 21% said parents, 15% said husbands, and 6% said wives (Figure 10).



**Figure 9.** Household member who decides how to use harvested fish.

Almost a similar pattern from above regarding who makes the decision to use the income from fish sold, whereby 50% of respondents said husbands and wives decide together, 20% said that parents decide, 15% respondents said that the wife makes the decision and 11% said husbands decide.



**Figure 10.** Household member who decides how to use the income from fish sales.

## 5. Discussion and conclusion

The survey highlighted the food consumption of women of reproductive age in *Activity* areas. The ongoing conflicts, access restrictions and internet interruption made it challenging but by engaging experienced community facilitators and making flexible schedules, the *Activity* team was able to complete the survey with a 97% response rate.

It is to note that the surveyed townships experienced ongoing conflicts, drought, flood, rising cost of common food items which might have affected the household's ability to access diverse foods, hence, the decreased in diversity score from previous year by 24%, a similar trend from a recent report conducted by IFPRI (MAPSA, 2023).

### Dietary diversity score

Overall, 55% of the respondents in the 26 townships surveyed had consumed at least five of the 10 food groups. The only township that reported all women consuming at least five food groups is Myothit. The rate was also high in Monghpyak (89%), and Nyaung Shwe (82%) Townships. The high score might be due to coping mechanisms of farmers such as increased consumption of more food produced from their own ponds and gardens, finding alternative sources of income, using savings and borrowing from other people.

Hsihseng Township, Southern Shan had the lowest dietary diversity score of 3.8, it can be surmised that it consisted of rice, green leafy vegetable and some fish or other types of vegetables only. It is no different results for Pekhon and Pinlaung Townships which are also in Southern Shan with only a dietary diversity score of 4. Even though these areas are known to have fertile soil, cooler temperature and a higher annual production output of crops when compared to other parts of the country, it did

not support the achievement of a high diet score among respondents, factors such as conflicts and drought may have affected their ability to access food as indicated earlier.

### **Food groups and fish consumption**

Rice as the staple food in Myanmar was widely consumed. The second-most consumed food group was meat, poultry and fish, which is surprising and is contrary to the recent report that showed a decline in animal-source protein (meat, fish and eggs) in the country (MAPSA, 2023). With the current shocks and inflation, animal protein is mostly substituted by a cheaper option such as legumes and vegetables. It is likely that the respondents eat fish from their homestead ponds which could explain the contradicting results.

The least consumed food group was milk and milk products in line with common food practices because people in Myanmar are not in the habit of drinking milk unless it is mixed with tea (lah-phat-yay), which is usually condensed milk as mentioned in earlier section. In a recent trend, however, many young children have been consuming sweetened milk products such as sweetened yoghurt drinks which are high in sugar. Although with the high inflation rates, parents might be less likely to purchase it.

Despite the increasing price of food, most respondents said that they had consumed fish over the previous 7 days, with an average of five meals per week. Since the respondents are from fish farming households, it can be assumed that they sometimes harvest fish for their own consumption. This highlights the importance of home food production to augment daily diets.

Small indigenous fish species are highly nutritious when eaten whole with head and bones, fortunately over 70% of respondents reported eating SIS in the previous 7 days, evidence of strong nutrition message provided by the *Activity*.

The popular fish based processed products are dried fish (76%) and fish paste (70%) which have a long shelf life and are nutrient-dense when good processing practices are observed. However, many processors are still using traditional methods that are below the hygiene and safety standards which may have negative health implications. Hence, upgrading is required to ensure that these food products can help in increasing nutrient intakes among women of reproductive age.

In conclusion, the results of the survey show that despite the fact that women in the *Activity* areas have a decreased dietary quality, they are still consuming more nutritious food than other surveys suggest e.g. the MAPSA finding that the cost of a basic diet has increased by over 80% during the last 18-months with 50% of the total population now living in poverty. Fish producing households are able to consume their own fish products which demonstrates the value of the *Activity*'s work.

## Reference

MAPSA (2023). *The state of food security and nutrition in Myanmar 2022-23: Findings from five rounds of the Myanmar Household Welfare Survey. Myanmar SSP Working Paper 45*. Washington, DC: International Food Policy Research Institute (IFPRI).

## Annex 1. MDD-W Food sub-groups guide

Food sub-groups	Example
Grain	Porridges, breads, flatbreads, rice, pasta/noodles, millet or other foods made from grains
Vegetables or roots that are yellow or orange colored inside	Pumpkin, carrots, squash or sweet potatoes
White roots and tubers or plantains	White potatoes, white yams, white-fleshed sweet potatoes, manioc/cassava/yucca, cocoyam, taro
Dark green leafy vegetables	Chinese cabbage, romaine, Bibb lettuce, bean leaves and pumpkin leaves
Fruits that are dark yellow or orange inside	Ripe mango, ripe papaya, ripe, deep yellow-fleshed or orange-fleshed bananas, orange-fleshed sweet potato
Other fruits	Unripe mango and papaya, white/cream-fleshed bananas
Other vegetables	Fresh peas, snow peas, snap peas or green beans, cucumber, tomato and okra
Meat made from animal organs	Liver, kidney, heart or other organ meats or blood-based foods, including from wild game
Other types of meat or poultry	Beef, pork, lamb, goat, rabbit, wild game meat, chicken, duck, other birds
Eggs	Eggs from poultry or any other bird
Fish or seafood	Fresh or dried fish, shellfish or seafood
Beans or peas	Mature beans or peas (fresh or dried seed), lentils or bean/ pea products, including hummus, tofu and tempeh
Nuts or seeds	Any tree nut, groundnut/peanut, or certain seeds or nut/seed “butters” or pastes
Milk or milk products	Milk, cheese, yoghurt or other milk products, but NOT including butter, ice cream, cream or sour cream
Insects or other small protein food	Insects, insect larvae/grubs, insect eggs and land and sea snails
Red palm oil	Red palm oil
Oils and fats	Oil, fats or butter added to food or used for cooking, including extracted oils from nuts, fruits and seeds, and all animal fat
Savory and fried snacks	Crisps and chips, fried dough, other fried snacks
Sweets	Sugary foods, such as chocolates, candies, cookies/sweet biscuits and cakes, sweet pastries or ice cream
Sugar-sweetened beverages	Sweetened fruit juices and “juice drinks”, soft drinks/fizzy drinks, chocolate drinks, malt drinks, yoghurt drinks
Condiments and seasoning	Ingredients used in small quantities for flavor, such as chilies, spices, herbs, fish powder, tomato paste, flavor



Other beverages and foods	Tea or coffee if not sweetened, clear broth, alcohol, Pickles, olives and similar
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## Annex 2. Ranking of food groups per Township

### Six Townships in Kachin State

Food groups	Bahmo		Mansi		Mogaung		Momaik		Myitkyina		Waingmaw	
	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank
Food group 01: Grain, White roots and tubers or plantains	100%	1	100%	1	100%	1	100%	1	100%	1	100%	1
Food group 02: Beans or peas	33%	5	33%	4	25%	5	67%	3	29%	6	13%	8
Food group 03: Nuts or seeds	50%	4	33%	5	25%	6	33%	5	0%	9	0%	10
Food group 04: Milk or milk products	0%	9	0%	10	0%	9	0%	9	0%	10	4%	9
Food group 05: Meat, poultry, fish	100%	2	100%	2	100%	2	100%	2	100%	2	100%	2
Food group 06: Eggs	0%	10	33%	6	0%	10	33%	6	57%	3	25%	7
Food group 07: Dark green leafy vegetables	67%	3	33%	7	75%	3	33%	7	43%	4	54%	4
Food group 08: Vitamin A-rich vegetable and fruits	17%	7	67%	3	25%	7	0%	10	14%	8	50%	5
Food group 09: Other vegetables	17%	8	33%	8	75%	4	67%	4	43%	5	63%	3
Food group 10: Other fruits	33%	6	33%	9	25%	8	33%	8	29%	7	42%	6

### Five Townships in Magway Region

Food groups	Myothit		Ngape		Pwintbyu		Salin		Seikphyu	
	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank
Food group 01: Grain, White roots and tubers or plantains	100%	1	100%	1	100%	1	100%	1	100%	1
Food group 02: Beans or peas	11%	9	35%	7	50%	5	54%	3	33%	6
Food group 03: Nuts or seeds	44%	8	0%	9	0%	10	0%	9	0%	8
Food group 04: Milk or milk products	0%	10	0%	10	4%	9	0%	10	0%	9
Food group 05: Meat, poultry, fish	100%	2	100%	2	92%	2	95%	2	100%	2
Food group 06: Eggs	78%	7	12%	8	13%	7	18%	8	0%	10
Food group 07: Dark green leafy vegetables	89%	6	88%	3	38%	6	49%	5	67%	3
Food group 08: Vitamin A-rich vegetable and fruits	100%	3	59%	4	54%	4	37%	6	33%	7
Food group 09: Other vegetables	100%	4	47%	5	67%	3	54%	4	67%	4
Food group 10: Other fruits	89%	5	41%	6	8%	8	29%	7	67%	5

## One Township in Mandalay and another Township in Sagaing Region

Food groups	Madaya		Khin-U		Shwebo		Wetlet	
	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank
Food group 01: Grain, White roots and tubers or plantains	100%	1	100%	1	100%	1	100%	1
Food group 02: Beans or peas	29%	6	44%	4	41%	6	71%	4
Food group 03: Nuts or seeds	6%	9	0%	9	4%	9	0%	10
Food group 04: Milk or milk products	3%	10	0%	10	1%	10	3%	9
Food group 05: Meat, poultry, fish	100%	2	100%	2	100%	2	100%	2
Food group 06: Eggs	29%	7	16%	7	35%	7	24%	7
Food group 07: Dark green leafy vegetables	71%	4	38%	5	56%	5	26%	6
Food group 08: Vitamin A-rich vegetable and fruits	37%	5	34%	6	79%	4	47%	5
Food group 09: Other vegetables	71%	3	59%	3	87%	3	76%	3
Food group 10: Other fruits	17%	8	13%	8	34%	8	15%	8

## Three Townships in Eastern Shan

Food groups	Kengtung		Monghpyak		Tachileik	
	Percent	Rank	Percent	Rank	Percent	Rank
Food group 01: Grain, White roots and tubers or plantains	100%	1	100%	1	92%	2
Food group 02: Beans or peas	8%	9	33%	7	23%	8
Food group 03: Nuts or seeds	50%	8	22%	9	15%	9
Food group 04: Milk or milk products	0%	10	0%	10	4%	10
Food group 05: Meat, poultry, fish	100%	2	100%	2	100%	1
Food group 06: Eggs	75%	4	67%	5	65%	3
Food group 07: Dark green leafy vegetables	92%	3	89%	3	50%	5
Food group 08: Vitamin A-rich vegetable and fruits	54%	6	33%	8	27%	7
Food group 09: Other vegetables	63%	5	56%	6	50%	6
Food group 10: Other fruits	50%	7	89%	4	54%	4

## Eight Townships in Southern Shan

Food groups	Hopong		Hsihseng		Nansang		Nyaungshwe		Pekon		Pindaya		Pinlaung		Taunggyi	
	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank	Percent	Rank
Grain, White roots and tubers or plantains	100%	1	100%	1	100%	1	100%	1	100%	1	100%	1	0%	5	100%	1
Beans or peas	33%	4	0%	7	18%	7	36%	6	32%	6	45%	5	100%	1	57%	4
Nuts or seeds	17%	9	40%	4	15%	8	27%	7	3%	8	15%	9	0%	6	27%	8
Milk or milk products	0%	10	0%	8	0%	10	9%	10	0%	10	35%	7	0%	7	3%	10
Meat, poultry, fish	100%	2	100%	2	100%	2	100%	2	100%	2	100%	2	100%	2	100%	2
Eggs	33%	5	40%	6	10%	9	27%	8	3%	9	30%	8	0%	8	7%	9
Dark green leafy vegetables	33%	6	60%	3	87%	3	73%	5	71%	3	65%	3	100%	3	80%	3
Vitamin A-rich vegetable and fruits	33%	7	0%	9	44%	5	82%	4	16%	7	60%	4	0%	9	53%	5
Other vegetables	67%	3	40%	5	72%	4	91%	3	37%	5	45%	6	0%	10	43%	6
Other fruits	33%	8	0%	10	23%	6	27%	9	42%	4	15%	10	100%	4	40%	7

### Annex 3. Fish species consumed in each Township

#### Fish Consumption: Six Townships in Kachin State

Fish Species	Bhamo	Mansi	Mogaung	Momauk	Myitkyina	Waingmaw
Rohu/Nga- myit- chin	67%	33%	100%	33%	100%	35%
Mrigal/Nga-gyin-phyu	33%	33%	25%	33%		4%
Common Carp/Shwe- war-nga- gyin			100%		43%	26%
Grass Carp/Myak -sar- nga -gyin			25%			4%
Silver Carp/Ngwe- yaung- nga- gyin						
Big head carp/Gaung -gyi -nga -gyin		33%				
Tilapia-mixed	67%	100%		100%		
Silver barb/Nga-khone-ma-gyi						
Striped river catfish/Pangasius/Nga-tan						4%
Striped river catfish/Pangasius/Nga-tan						4%
Pacu/Ye- cho-nga-moke	17%		50%		14%	9%
Climbing perch/Nga-bye-ma	17%					22%
Striped snakehead/Nga-yant						39%
Intha carp						
Zig zag eel/Nga- mway- doe						39%
Bronze featherback/Nga-pe	17%		25%			22%
Three spot gourami						
Walking catfish/Nga khu		33%				17%
Asian swamp eel/Ngar shint						4%
Spotted barb/Nga-khone-ma(SIS)			50%	100%		43%
Burmese flying barb/Nga daung zinn	17%		25%			9%
Malabar loach, common spiny loach/Nga tha le htoe	33%		50%			17%
Indian glassy fish/Nga zin zat	17%					
Mola: mola carplet/Nga bel phyu	67%	33%		100%		30%
Burmese barb/Nga maw tawt						
Carplet barb/Nga pha ma						9%
Gangetic scissortail rasbora/Nga ye paw			25%			39%

## Fish Consumption: Five Townships in Magway

Fish Species	Myothit	Ngape	Pwintbyu	Salin	Seikphyu
Rohu/Nga- myit- chin	22%	12%	23%	17%	100%
Mrigal/Nga-gyin-phyu	22%		59%	17%	
Common Carp/Shwe- war-nga- gyin			14%	5%	
Grass Carp/Myak -sar- nga -gyin			5%		
Silver Carp/Ngwe- yaung- nga- gyin					
Big head carp/Gaung -gyi -nga -gyin				2%	
Tilapia-mixed	22%	82%	18%	36%	
Silver barb/Nga-khone-ma-gyi	22%		18%	10%	
Striped river catfish/Pangasius/Nga-tan	11%		9%	24%	
Striped river catfish/Pangasius/Nga-tan	11%		9%	24%	
Pacu/Ye- cho-nga-moke	22%		5%	3%	
Climbing perch/Nga-bye-ma				12%	
Striped snakehead/Nga-yant		24%	5%	20%	
Intha carp					
Zig zag eel/Nga- mway- doe	11%	24%	5%		
Bronze featherback/Nga-pe				7%	
Three spot gourami				3%	
Walking catfish/Nga khu	11%			2%	
Asian swamp eel/Ngar shint					
Spotted barb/Nga-khone-ma(SIS)	33%	24%	32%	32%	
Burmese flying barb/Nga daung zinn	11%		9%		
Malabar loach, common spiny loach/Nga tha le htoe	44%	35%	27%	15%	
Indian glassy fish/Nga zin zat		6%	5%		
Mola: mola carplet/Nga bel phyu			14%	5%	
Burmese barb/Nga maw tawt	11%	6%	50%	17%	
Carplet barb/Nga pha ma		41%			
Gangetic scissortail rasbora/Nga ye paw					

## Fish Consumption: Madaya in Mandalay Region and Other Townships in Sagaing Region

Fish Species	Madaya	Khin-U	Shwe Bo	Wetlet
Rohu/Nga- myit- chin	57%	53%	74%	44%
Mrigal/Nga-gyin-phyu		19%	3%	4%
Common Carp/Shwe- war-nga- gyin		3%	46%	4%
Grass Carp/Myak -sar- nga -gyin				
Silver Carp/Ngwe- yaung- nga- gyin		3%		
Big head carp/Gaung -gyi -nga -gyin		3%	3%	7%
Tilapia-mixed	74%	28%	54%	30%
Silver barb/Nga-khone-ma-gyi				
Striped river catfish/Pangasius/Nga-tan	6%	47%	7%	7%
Striped river catfish/Pangasius/Nga-tan	6%	47%	7%	7%
Pacu/Ye- cho-nga-moke	9%		7%	4%
Climbing perch/Nga-bye-ma				4%
Striped snakehead/Nga-yant	3%	3%	1%	
Intha carp				
Zig zag eel/Nga- mway- doe			1%	
Bronze featherback/Nga-pe		3%	1%	
Three spot gourami				
Walking catfish/Nga khu				
Asian swamp eel/Ngar shint				
Spotted barb/Nga-khone-ma(SIS)	29%	38%	46%	59%
Burmese flying barb/Nga daung zinn	26%	3%	15%	52%
Malabar loach, common spiny loach/Nga tha le htoe	6%	31%	18%	33%
Indian glassy fish/Nga zin zat	17%	25%	28%	33%
Mola: mola carplet/Nga bel phyu	3%	19%	22%	15%
Burmese barb/Nga maw tawt	11%		3%	56%
Carplet barb/Nga pha ma	3%			
Gangetic scissortail rasbora/Nga ye paw				

## Fish Consumption: Three Townships in Eastern Shan

Fish Species	Kengtung	Monghpyak	Tachileik
Rohu/Nga- myit- chin	35%		
Mrigal/Nga-gyin-phyu			
Common Carp/Shwe- war-nga- gyin	10%	33%	8%
Grass Carp/Myak -sar- nga -gyin			
Silver Carp/Ngwe- yaung- nga- gyin			
Big head carp/Gaung -gyi -nga -gyin			
Tilapia-mixed	65%	78%	69%
Silver barb/Nga-khone-ma-gyi			
Striped river catfish/Pangasius/Nga-tan		11%	
Striped river catfish/Pangasius/Nga-tan		11%	
Pacu/Ye- cho-nga-moke			
Climbing perch/Nga-bye-ma			
Striped snakehead/Nga-yant		11%	8%
Intha carp			
Zig zag eel/Nga- mway- doe			
Bronze featherback/Nga-pe		22%	
Three spot gourami			
Walking catfish/Nga khu		11%	31%
Asian swamp eel/Ngar shint			
Spotted barb/Nga-khone-ma(SIS)		33%	19%
Burmese flying barb/Nga daung zinn			15%
Malabar loach, common spiny loach/Nga tha le htoe		33%	23%
Indian glassy fish/Nga zin zat			4%
Mola: mola carplet/Nga bel phyu	5%	33%	27%
Burmese barb/Nga maw tawt			
Carplet barb/Nga pha ma			
Gangetic scissortail rasbora/Nga ye paw			



## Fish Consumption: Eight Townships in Southern Shan

Fish Species	Hopong	Hsihseng	Nansang	Nyaung Shwe	Pekon	Pinlaung	Pindaya	Taunggyi
Rohu/Nga- myit- chin	33%				3%			15%
Mrigal/Nga-gyin-phyu	17%							15%
Common Carp/Shwe- war- nga- gyin	17%	20%	51%	55%	37%		65%	46%
Grass Carp/Myak -sar- nga -gyin	17%		79%	18%	11%		80%	8%
Silver Carp/Ngwe- yaung- nga- gyin					3%			
Big head carp/Gaung -gyi - nga -gyin	17%							
Tilapia-mixed	17%	80%	69%	100%	21%		35%	19%
Silver barb/Nga-khone-ma- gyi		100%			3%			
Striped river catfish/Pangasius/Nga-tan								4%
Striped river catfish/Pangasius/Nga-tan								4%
Pacu/Ye- cho-nga-moke					3%			
Climbing perch/Nga-bye- ma								
Striped snakehead/Nga-yant	17%		3%	27%	37%	100%	35%	23%
Intha carp	17%		18%		3%			
Zig zag eel/Nga- mway- doe								
Bronze featherback/Nga-pe			3%	18%	16%		30%	15%
Three spot gourami					5%			
Walking catfish/Nga khu			5%	9%			10%	
Asian swamp eel/Ngar shint	33%			18%			15%	
Spotted barb/Nga-khone- ma(SIS)	83%		15%	27%				15%
Burmese flying barb/Nga daung zinn			5%		3%			
Malabar loach, common spiny loach/Nga tha le htoe	50%		59%		45%			19%
Indian glassy fish/Nga zin zat								
Mola: mola carplet/Nga bel phyu	17%							
Burmese barb/Nga maw tawt								
Carplet barb/Nga pha ma								
Gangetic scissortail rasbora/Nga ye paw					11%			

## Annex 4. MDD-W Survey Questionnaire

"Hello, my name is \_\_. I am currently conducting a survey for WorldFish "Fish for Livelihoods project". We work with small scale aquaculture farmers and fisherfolks in Magway, Mandalay, Kachin, Eastern and Southern Shan. The goal of the project is to increase income and improve the nutrition of households that we are working with. May I ask you some questions about your food intake for the past 24 hours? The interview will take at least 20 minutes of your time."

မင်္ဂလာပါ။ ကျွန်တော်/ကျွန်မကတော့ \_\_\_\_\_ပါ။ WorldFish အဖွဲ့ရဲ့ "Fish For Livelihoods" စီမံချက် အတွက် စစ်တမ်းကောက်ယူနေတာပါ။ ကျွန်တော်တို့ကတော့ စီမံချက် ဧရိယာများဖြစ်တဲ့ မကွေး၊ မန္တလေး၊ ကချင်၊ ရှမ်း၊ အရှေ့ နှင့် ရှမ်းတောင်ပိုင်းရှိ အသေးစားငါးမွေးမြူသူများ၊ ငါးဖမ်းသူများနှင့်အတူ စီမံချက်ကို အကောင်အထည်ဖော်နေ ပါတယ်။ စီမံကိန်း၏ရည်မှန်းချက်ကတော့ ကျွန်ုပ်တို့နှင့် အတူ လက်တွဲ လုပ်ကိုင်နေသော အိမ်ထောင်စုများ၏ ဝင်ငွေတိုးရန် နှင့် အာဟာရများ တိုးတက်စေရန်ဖြစ်ပါတယ်။ လွန်ခဲ့သော ၂၄ နာရီအတွင်း သင်၏အစားအစာ စားသုံးမှုနှင့် ပတ်သက်၍ (အမ/ညီမ/အဒေါ်)ကို မေးခွန်းလေးတွေ မေးချင်ပါတယ်။ မေးခွန်းဖြေဆိုရန် ကြာချိန်မှာ အနည်းဆုံးမိနစ် ၂၀ လောက် ကြာပါလိမ့်မည်။

>>> Would you like to participate in this interview? (မေးခွန်းလေးတွေ မေးလို့ရမလား/မေးခွန်းလေးတွေ ဖြေပေးနိုင်မလား?)

1 Yes (ဖြေပေးနိုင်ပါတယ်)

0 No (မဖြေပေးနိုင်ပါ) >>> "If no, find another HH" (မဖြေပေးနိုင်ပါက အခြား အိမ် တစ်အိမ် ကို ပြောင်းပေးပါ။)

Q1. Date of interview (အင်တာဗျူးရက်စွဲ) : \_\_\_\_\_

Q2. Start Time (စတင်ချိန်) : \_\_\_\_\_

Q3. Name of IP (မိတ်ဖက်အဖွဲ့အစည်းအမည်) : \_\_\_\_\_

Q4. Name of Township (မြို့နယ်) : \_\_\_\_\_

Q5. Name of enumerator/Community Facilitator (စာရင်းကောက်သူ၏အမည်): \_\_\_\_\_

Q6. Village Tract/Ward (ကျေးရွာအုပ်စု/ ရပ်ကွက်) : \_\_\_\_\_

Q7. Village/Ward (ကျေးရွာ အမည်) : \_\_\_\_\_

### Respondent Information (ဖြေဆိုသူ၏ သတင်းအချက်အလက်)

Q1. Farmer ID (တောင်သူနံပါတ်) : \_\_\_\_\_

Q2. Name of respondent(ဖြေဆိုသူ၏အမည်) : \_\_\_\_\_

Q3. Sex of respondent (ကျား/မ) : \_\_\_\_\_

Q4. Age of respondent အသက် (ပြည့်ပြီးအသက်) : \_\_\_\_\_

Q5. Age Category (အသက်အုပ်စု)

1. 15 to 18 (Under 19) (၁၅ နှစ်မှ ၁၉ နှစ်အတွင်း (၁၉ နှစ်အောက်))
2. 19 to 49 (၁၉ နှစ်မှ ၄၉ နှစ်အတွင်း)
3. >49 (၄၉ နှစ်အထက်)

Q6. Is the current respondent a woman between 15 and 49 years of age? \* (လက်ရှိဖြေကြားသောသူသည် အသက်

၁၅နှစ်မှ ၄၉ နှစ်ကြားဟုတ်ပါသလား။)

1. Yes (ဟုတ်ပါတယ်)
1. No (မဟုတ်ပါ)

Q7. Highest level of Education completed (ပြီးမြောက်ခဲ့သည့် အမြင့်ဆုံးပညာရေး)

- |   |                         |
|---|-------------------------|
| 1. No formal education (ဘုန်းကြီးကျောင်းပညာရေး/အသုံးလုံး) | 2. Grade 1              |
| 3. Grade 2  | 4. Grade 3              |
| 5. Grade 4  | 6. Grade 5              |
| 7. Grade 6  | 8. Grade 7              |
| 9. Grade 8  | 10. Grade 9             |
| 11. Grade 10  | 12. Grade 11            |
| 13. degree/diploma  | 14. Vocational Training |
| 15. Other   |                         |

Please specify "Other Level of Education" အခြား ဖော်ပြပါ( အမည်ကို တိတိကျကျ ဖော်ပြပေးပါ။) : \_\_\_\_\_

Q8. Marital Status (အိမ်ထောင်ရှိ/မရှိ)

1. Single, never married (အပျို/ လူပျို)
2. Married (အိမ်ထောင်ရှိ)
3. Widow/Widower (မုဆိုးဖို/ မုဆိုးမ)
4. Divorced/Separated (အိမ်ထောင်ကွဲ/ ခွဲနေ)

Q9. How many household members are there? (မိသားစုဝင် အရေအတွက်) \_\_\_\_\_

Q10. How many under 5-year-old children are there at your home? (သင့်အိမ်တွင် ငါးနှစ်အောက် ကလေး ဘယ်နှစ်ယောက်ရှိပါသလဲ။) \_\_\_\_\_

Q11. Did your household stock fingerlings previous year? (သင့်အိမ်တွင် ယခင်နှစ်က ငါးမွေးမြူခဲ့ပါသလား)

1. Yes 0. No

Q11. If Yes, have your household harvested fingerlings? (ယခင်နှစ်က ငါးမွေးမြူခဲ့လျှင် ယခု ငါးဖော်ပြီးပြီလား)

1. Yes 0. No

"MDDW: Now I'd like to ask you to describe everything that you ate or drank yesterday during the day or night, whether you ate it at home or anywhere else. Please include all foods and drinks, any snacks or small meals, as well as any main meals. Remember to include all foods you may have eaten while preparing meals or preparing food for others. Please also include food you ate even if it was eaten elsewhere, away from your home." (မနေ့က သင့်အိမ်မှာ ဖြစ်စေ၊ အခြား မည်သည့် နေရာ (အလှူအိမ်၊

စားသောက်ဆိုင်၊ ထမင်းဆိုင်) တွင် မဆို နေ့ရော ညပါ စားခဲ့ သောက်ခဲ့သမျှ အစားအစာတွေကို ပြောပြပေးနိုင်မလား။ ကျေးဇူးပြုပြီး စားခဲ့သမျှ အစားအသောက် (အချိုရည်၊ လက်ဖက်ရည်၊ သစ်သီးဖျော်ရည် စသည်)၊ သရေစာ၊ အစာပြေ ပါမကျန် အခြားစားခဲ့သမျှ စားဖွယ်ရာများကို ပြောပေးပါ။ အစားအစာ ပြင်ဆင်ချိန်၊ ချက်ပြုတ်ချိန် တွင် စားခဲ့သည် များကို ပါ ထည့်သွင်း ပြောပြပေးပါ။)

"Q1. Was the last 24 hours a good representative of your average daily food consumption? i.e. if you fasted, or ate an above average amount, maybe due to a festival, this would not be a good representative."

Q1. လွန်ခဲ့သော ၂၄ နာရီအတွင်း သင်စားခဲ့သော အစာသည် သင့် နေ့စဉ်သာမန် စားသုံးမှုကို ကိုယ်စားပြုပါသလား။

ဆိုလိုသည်မှာ (သင်အစာရှောင်တဲ့အခါ၊ လိုအပ်တာထက်ပိုစားတာ၊ ပွဲ/အလှူမှာစားတာ) ဒါတွေဟာ သင့်နေ့စဉ်သာမန် စားသုံးမှုကို ကိုယ်စားမပြုပါ။

"If no, why? (Festival? other specify)" ကိုယ်စားမပြုပါက ဘာကြောင့်လဲ ဖော်ပြပေးပါ။ (ပွဲ/အလှူ???) \_\_\_\_\_

"Q2. In the last 24 hours, when did you eat, including snacks?"

Q2. ပြီးခဲ့သည့် ၂၄ နာရီအတွင်း၊ သရေစာ အပါအဝင် မည်သည့်အချိန်တို့တွင်အစာ စားသုံးခဲ့သနည်း။

1. Morning (5am to 12am) မနက်ပိုင်း (နံနက် ၅နာရီမှ နေ့လည် ၁၂နာရီ)
2. Mid-day (12am) နေ့လည်ပိုင်း (နေ့လည် ၁၂နာရီ)

3. Afternoon (12am to 5pm) မွန်းလွဲပိုင်း \*(နေ့လည် ၁၂နာရီမှ ညနေ ၅နာရီ)
4. Evening (5 pm to 7 pm) ညနေ (၅နာရီ မှ ည ၇နာရီ)
5. Night (7pm to 5 am) ညနေပိုင်း \* (ညနေ ၅နာရီ မှ ည ၇နာရီ)

Sr	What did you eat from the following food Groups?	Morning	Mid-day	Afternoon	Evening	Night
1	Any foods made from grains, like: Porridges, breads, flatbreads, rice, pasta/noodles, millet or other foods made from grains (ဆန်၊ ဂုံ၊ ပြောင်း၊ ဆပ်၊ လူး၊ စသည့် အစေ့အဆန်မှ ရသော အစားအစာများ - ပေါင်မုန့်၊ ပလာတာ၊ နံပြား၊ ခေါက်ဆွဲ၊ မုန့်ဖတ်)					
2	Any vegetables or roots that are orange colored inside, like: Pumpkin, carrots, squash or sweet potatoes that are yellow or orange inside (အတွင်းသား လိမ္မော်ရောင်ရှိ ဟင်းသီးဟင်းရွက်နှင့် ဥများ - ဖရုံသီး၊ မုည့်၊ ကန်စွန်းဥ အဝါ၊ မုန်လာဥနီ)					
3	Any white roots and tubers or plantains, such as: White potatoes, white yams, white-fleshed sweet potatoes, manioc/cassava/yucca, cocoyam, taro or any other foods made from white-fleshed roots or tubers, or plantains (အတွင်းသား အဖြူရောင်ရှိ သစ်ဥ သစ်ဖုများ - အလူး၊ ပိန်းဥ၊ အာတာလွတ်ဥ၊ မြောက်ဥ၊ ကန်စွန်းဥအဖြူ)					
4	Any dark green leafy vegetables, such as: Chinese cabbage, romaine, bibb lettuce, bean leaves and pumpkin leaves (အစိမ်းရင့်ရောင်အရွက်များ - ဖရုံ၊ ဗူး၊ ဂေါ်ရခါး၊ ပဲညွန့်၊ မုန်ညင်း၊ ကိုက်လံ၊ ဒန့်သလွန်)					
5	Any fruits that are dark yellow or orange inside, like: Ripe mango, ripe papaya, ripe, deep yellow-fleshed or orange-fleshed bananas, orange-fleshed sweet potato, carrot, pumpkin and deep yellow- or orange-fleshed squash (အတွင်းသား လိမ္မော်ရောင်နှင့် အဝါရောင်ရှိသော အသီးအနှံများ - သရက်သီးအမှည့်၊ သဘောသီးအမှည့်၊ ရွှေခိုက်ပျောသီး၊ ပိန္နဲသီးမှည့်)					
6	Any other fruits: Unripe mango and papaya, white/cream-fleshed bananas (အခြားသစ်သီးများ - သရက်သီးအစိမ်း၊ သဘောသီးအစိမ်း၊ အဖြူရောင် အသားရှိ ငှက်ပျောသီး၊ သံပုရာသီး)					
7	Any other vegetables: fresh peas, snow peas, snap peas or green beans, cucumber, tomato and okra (အခြားဟင်းသီးဟင်းရွက် - ပဲအစို၊ ချဉ်ပေါင်ရွက်၊ မျှစ်၊ ခရမ်းချဉ်သီး၊ ရုံးပတီသီး၊ သခွားသီး၊ ပိန္နဲသီးအနု၊ ခရမ်းသီး)					

8	Any meat made from animal organs, such as: Liver, kidney, heart or other organ meats or blood-based foods, including from wild game (ကြက်၊ ဝက်၊ အမဲတို့၏ အသည်း၊ နှလုံး၊ ကျောက်၊ အူ၊ သွေးခဲ)					
9	Any other types of meat or poultry, like: Beef, pork, lamb, goat, rabbit, wild game meat, chicken, duck, other birds" (အသား၊ ကြက်ဘဲ၊ ငှက်၊ ယုန်၊ ဆိတ်၊ ဝက်၊ အမဲ)					
10	Any eggs: Eggs from poultry or any other bird (ဥများ)					
11	Any fish or seafood, whether fresh or dried: Fresh or dried fish, shellfish or seafood (ငါးနှင့် ပင်လယ်ထွက်ကုန်များ-အခြောက်၊ အစို)					
12	Any beans or peas, such as: Mature beans or peas (fresh or dried seed), lentils or bean/ pea products, including hummus, tofu and tempeh (ပဲမျိုးစုံ-ပဲအခြောက်၊ တိုဖူး၊ ပဲနို့)					
13	Any nuts or seeds, like: Any tree nut, groundnut/peanut, or certain seeds or nut/seed "butters" or pastes" (မြေပဲ၊ သီဟိုဠ်စေ့၊ နေကြာစေ့၊ ဖရုံစေ့၊ ကွာစေ့၊ အခွံမာသီးနှင့် အစေ့များ)					
14	Any milk or milk products, such as: Milk, cheese, yoghurt or other milk products, but NOT including butter, ice cream, cream or sour cream (သကြားမပါသောနွားနို့၊ ဒိန်ချဉ်နှင့် အခြားနို့ထွက်ကုန် (ရေခဲမုန့်၊ ထောပတ် တို့မပါပါ)					
15	Any insects or other small protein foods, including: Insects, insect larvae/grubs, insect eggs and land and sea snails" (ခရု၊ ပုရစ်၊ ခါချဉ်၊ ပျားသလက် စသည့်အင်းဆက် ကောင်လေးများ)					
16	Any red palm oil (စွန်ပလွန်ဆီ)					
17	Any oils and fats: Oil, fats or butter added to food or used for cooking, including extracted oils from nuts, fruits and seeds, and all animal fat" (ချက်ပြုတ်သည့်ဆီ၊ တိရစ္ဆာန်ဆီ)					
18	Any savoury and fried snacks, such as: Crisps and chips, fried dough, other fried snacks" (အရသာရှိသော သရေစာများ၊ အကြွပ်ကြော်များ)					
19	Any sweets, such as: Sugary foods, such as chocolates, candies, cookies/sweet biscuits and cakes, sweet pastries or ice cream" (ချောကလက်၊ ဘီစကစ်၊ ကွတ်ကီး၊ ကိတ်မုန့်၊ ရေခဲမုန့်)					

20	Any sugar-sweetened beverages, like: Sweetened fruit juices and "juice drinks", soft drinks/fizzy drinks, chocolate drinks, malt drinks, yoghurt drinks, sweet tea or coffee with sugar"(ချိုသော အဖျော်ယမကာများ (သကြားထည့် ဒိန်ချဉ်/ ကော်ဖီ/လက်ကော်ရည်၊ချောကလက်၊ အိုဗာတင်း၊ အမြုပ်ထဖော်ရည်များ)					
21	Any condiments and seasonings, such as: Ingredients used in small quantities for flavour, such as chillies, spices, herbs, fish powder, tomato paste, flavour cubes or seeds" ဟင်းခတ်အမွှေးအကြိုင် မဆလ၊ ကြက်သားမှုန့်၊ ငါးမှုန့်၊ နံနံမှုန့်၊ ငရုတ်ကောင်းမှုန့်					
22	Any other beverages and foods: Tea or coffee if not sweetened, clear broth, alcohol, Pickles, olives and similar" (အချိုဓာတ်မပါသော ဖျော်ရည်/ ကော်ဖီခါးခါး/သောက်စရာနှင့် အစားအစာများ (အရက်၊စွပ်ပြုတ်အကြည်)					
23	Other (အခြား)					
24	Nothing (ဘာမှမစားပါ)					

Please specify "Other for morning" (အခြား အမည်ကို တိတိကျကျ ဖော်ပြပေးပါ။) \_\_\_\_\_

Please specify "Other for mid-day" (အခြား အမည်ကို တိတိကျကျ ဖော်ပြပေးပါ။) \_\_\_\_\_

Please specify "Other for afternoon" (အခြား အမည်ကို တိတိကျကျ ဖော်ပြပေးပါ။) \_\_\_\_\_

Please specify "Other for evening" (အခြား အမည်ကို တိတိကျကျ ဖော်ပြပေးပါ။) \_\_\_\_\_

Please specify "Other for night" (အခြား အမည်ကို တိတိကျကျ ဖော်ပြပေးပါ။) \_\_\_\_\_

**Fish Consumption (ငါးစားသုံးမှု)**

I would like to ask about your fish consumption for the past 7 days.  
သင့်၏ ဂုရက် အတွင်း ငါးစားသုံးမှုနှင့် ပတ်သက်သော အကြောင်းအရာများကို မေးပါမယ်။

"Q1. In the past 7 days, how many meals containing fish have you consumed?"  
Q1. လွန်ခဲ့သော ဂုရက် အတွင်း သင်စားခဲ့သော အစားအစာများတွင် ထမင်းဘယ်နှစ်နပ်မှာ "ငါး" ပါဝင်ခဲ့ပါသလဲ။

Q2. What type of fish species did you consume in the past 7 days? (Q2. ၎င်း ဂုရက်အတွင်း သင် ဘာ "ငါး" တွေကို စားသုံးခဲ့သနည်း။) \_\_\_\_\_

Q3. In the past 7 days, how many meals did you have consumed the whole fish (including eyes, bones etc.)?  
(လွန်ခဲ့သော ဂုရက်အတွင်း သင်စားခဲ့သော အစားအစာဘယ်နှနပ်လောက် (ထမင်းဘယ်နှနပ်) တွင် ငါးကို တစ်ကောင်လုံး စားခဲ့ပါသလဲ။ ( ဥပမာ- မျက်လုံး၊ အရိုး၊ စသဖြင့်...)\* \_\_\_\_\_

\*\*\*You need to recall the Q 2. (Did you select/choice Nga-khone-ma, Nga daung zinn, Nga tha le htoe, Nga zin zat, Nga bel phyu, Nga maw tawt, Nga pha ma, Nga phel oung, Nga ye paw)  
(Q2 တွင် ဖြေခဲ့သည့် ငါးများတွင် ငါးခိုးမ၊ ငါးဒေါင်းဇင်း၊ ငါးသလဲထိုး၊ ငါးဇင်စပ်၊ ငါးဘဲဖြူ၊ ငါးမော့တော့၊ ငါးဖါးမ၊ ငါးရေပေါ် တို့ကို ဖြေခဲ့ခြင်း ရှိမရှိ ပြန်စဉ်းစားဖို့ လိုပါသည်။)

Q4. In the past 7 days, how many meals with SIS (whole including eyes, bones, etc.) did you consume? (လွန်ခဲ့သော ၇ ရက်အတွင်း သင်စားသောဟင်းတွင် ဒေသမျိုးရင်း ငါးမျိုးစိတ်သည် (ထမင်း) ဘယ်နှနပ်မှာပါဝင်ပါသလဲ။\*)

Q5. Which of the following criteria did the majority of SIS, consumed in the past 7 days, fit? (လွန်ခဲ့သော ၇ရက်အတွင်း သင်စားခဲ့သော ဒေသမျိုးရင်း ငါးမျိုးစိတ်ကို ဘယ်လိုမျိုးပုံစံ စားသုံးခဲ့ပါသလဲ။\*)

1. Whole fish (including eyes, bones, and head) (ငါးတစ်ကောင်လုံး (မျက်လုံး၊ အရိုး၊ခေါင်း အပါအဝင် စသည်ဖြင့်)
2. Fish with bones but head removed (ငါး (အရိုးပါသည် (သို့သော်) ခေါင်းဖယ်ထားသည်))
3. Head and bones removed (ခေါင်းနဲ့ အရိုးဖယ်ထားသည်)
4. Other (အခြားဖော်ပြပါ)

Q5. Please specify "Other" (အခြား အမည်ကို တိတိကျကျ ဖော်ပြပေးပါ။) \_\_\_\_\_

**"Processed fish means preserved fish with salt, dried prawn, dried fish, fermented fish and fish paste."**  
**Processed fish ဆိုသည်မှာ ငါးပိ၊ ငါးခြောက်၊ ပုစွန်ခြောက်၊ ငါးဆားနယ်၊ ငါးချဉ် ကို ခေါ်သည်။**

"Q1. In the past 7 days, how many meals containing processed fish products have you consumed? (Processed fish means fermented fish, dried fish, fish paste)" (လွန်ခဲ့သော ၇ရက်အတွင်း သင်စားခဲ့သော ဟင်းလျာများထဲတွင် ငါးဖြင့် ပြုလုပ်ထားသော အစားအစာ (ငါးပိ၊ ငါးခြောက်၊ ပုစွန်ခြောက်၊ ငါးဆားနယ်၊ ငါးချဉ်) သည် (ထမင်း) ဘယ်နှနပ်မှာ ပါဝင်ပါသလဲ။\*) \_\_\_\_\_

Q2. In what forms of processed fish that they ate? (ဟင်းလျာများထဲတွင် ပါဝင်ခဲ့သည့် ငါးဖြင့် ပြုလုပ်ထားသော အစားအစာက ငါးပိ? ငါးခြောက်? ငါးဆားနယ်? ငါးချဉ်?)

1. dried fish (ငါးခြောက်)
2. fish paste (ငါးပိ)
3. pickled fish (fermented fish with rice) (ငါးချဉ်)
4. smoked fish (ငါးကြပ်တိုက်)
5. others (အခြား)

Q4. Please specify the name of other processed fish? Please specify "Other" (အခြား အမည်ကို တိတိကျကျ ဖော်ပြပေးပါ။) \_\_\_\_\_

"Q3. What is the source (market, caught, ponds) of the fish they ate?" (သင်စားသုံးသည့် ငါး သို့ ငါးဖြင့် ပြုလုပ်ထားသော အစားအစာများကို ဘယ်ကရပါသလဲ။)

1. Market (ဈေး)
2. Caught (မြစ်ချောင်မှ ကိုယ်တိုင်ဖမ်း)
3. Pond (ငါးကန်)
4. Vendor (ဈေးသည်)
5. Gift from Other (လက်ဆောင်ရ)

Q4. Please specify the name of market? (ဈေးအမည်ကို ဖော်ပြပေးပါ။) \_\_\_\_\_

**Gender (ကျားမ အခန်းကဏ္ဍ)**

Q1. Of the fish harvested from your pond did you? (ငါးဖော်ပြီး ငါးများကို ရောင်းချခဲ့ပါသလား၊ လက်ဆောင်ပေးခဲ့ပါသလား၊ စားခဲ့ပါသလား၊ ချေးခဲ့ပါသလား၊ ရောင်းချရုံသာမက စားသုံးခဲ့ခြင်းရှိပါသလား။)

- 1. Sell it (ရောင်း)
- 2. Eat it (စားပါသည်)
- 3. Gift it (လက်ဆောင်ပေး)
- 4. Loan it(ချေး)

Q2. Who decides what to do with the fish harvested (whether to sell it or consume)? (ရောင်းချခြင်း စားသုံးခြင်း ကို မည်သူက ဆုံးဖြတ်ပါသလဲ။)

- 1 Husband (ယောက်ျား)
- 2 Wife (မိန်းမ)
- 3 Both together (အတူတကွ)
- 4 Parent/in law (မိဘ/ယောက္ခမ)
- 5 Other (အခြား)

Please specify "Other" (အခြား အမည်ကို တိတိကျကျ ဖော်ပြပေးပါ။) \_\_\_\_\_

"Q3. If sold, who decides what to do with the money from the sale of the fish?" (ငါးရောင်းချခြင်းမှ ရရှိသည့် ငွေစီမံခန့်ခွဲမှု မည်သူက ဆုံးဖြတ်သနည်း။)

- 1 Husband (ယောက်ျား)
- 2 Wife (မိန်းမ)
- 3 Both together (အတူတကွ)
- 4 Parent/in law (မိဘ/ယောက္ခမ)
- 5 Other (အခြား)

Please specify "Other" (အခြား အမည်ကို တိတိကျကျ ဖော်ပြပေးပါ။) \_\_\_\_\_

"For enumerator, please say: This is the end of the survey. Thank you for taking time to participate in this survey."  
(မေးခွန်းလေးတွေတော့ မေးပြီးသွားပါပြီ။ အခုလို အချိန်ပေးတဲ့အတွက် ပူးပေါင်းပါဝင်ပြီး ဖြေကြားပေးတဲ့အတွက် ကျေးဇူးတင်ပါတယ်။)

End time: (ပြီးဆုံးချိန်) \_\_\_\_\_