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

Feed the Future Burma Fish for Livelihoods Project

Fish Production Report – Small-scale Aquaculture (SSA)

In partnership with

USAID FROM THE AMERICAN PEOPLE
WorldFish
CGIAR
brac
KMSS
IWMI International Water Management Institute

Feed the Future Burma Fish for Livelihoods Project

Fish Production – Small-scale Aquaculture (SSA) Farmers

Authors:
Naw Christine Pan Wai
Monitoring & Evaluation Coordinator
WorldFish Myanmar

Syed Aman Ali
Monitoring, Evaluation and Communications Specialist
WorldFish Myanmar

Editor:
Michael Akester
Regional Director (Southeast Asia and Pacific)

Kachin, Magway, Sagaing, Mandalay, Southern and Eastern Shan
Report Published: February, 2024
Data Collection from the field: Jan to Sep, 2023

This publication was produced for review by the United States Agency for International Development

We wish to express our sincere thanks to the implementing partners (IPs) (Khin U team, Madaya team, Shwebo team, Wetlet team, Taunggyi team, Nansang team of BRAC Myanmar, Myothit, Seikphyu, Pwintphyu, Salin and Ngaphe team of PACT, KMSS Pekhon team, KMSS Keng Tung team, MFF Kachin team, and MFF Southern Shan team for their helpful support in surveying despite all the difficult circumstances. The data collection for this survey would not have been possible without the active participation and support of the field teams from the mentioned IPs.

Citation

This publication should be cited as: WorldFish. 2021. Fish Production Survey – Small-scale Aquaculture (SSA) Farmers' Survey. Penang, Malaysia: WorldFish.

Fish for Livelihoods

Capture fisheries are declining in Myanmar, yet 60% of the population's animal sourced food is fish. 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 aquaculture practices are socially acceptable and economically sound. The United States Agency for International Development (USAID) funded Feed the Future Burma Fish for Livelihoods project aims to increase fish production, labor productivity, food availability, and fish consumption especially for women and children from vulnerable households. It will provide opportunities for entrepreneurial activities in small-scale aquaculture systems and promote social behavioral change messages that direct home production and market purchases towards nutritious-conscious household decisions.

Acknowledgments

The Feed the Future Burma Fish for Livelihoods project is funded by the United States Agency for International Development (USAID).. The program is supported by contributors to the CGIAR Trust Fund.

Contact

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

Creative Commons License

Photo credits

Front cover, With You photographer; page 27, Phyo Nandar Aung/BRAC

Disclaimer

The opinions expressed here belong to the authors, and do not necessarily reflect those of the United States Agency for International Development, the United States Government, WorldFish, CGIAR Research Program on Fish Agri-Food Systems or CGIAR.

4.1 Table of Contents

1. Introduction

1.1. Project introduction and implementing areas

In October 2019, USAID initiated the Feed the Future Burma Fish for Livelihoods intervention, henceforth referred to as the *Activity,* for implementation over the period 2019-2027. The *Activity* focuses 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 promotes Small-Scale Aquaculture (SSA) to encourage 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, PACT (subsequently replaced by AYO), BRAC, Pekon Lake Committee, and Inle Lake Committee. The *Activity* also draws on the inputs from the International Water Management Institute (IWMI) a sister CGIAR entity and member of the 1-CGIAR[1].

The *Activity* focusses on five inland states and regions in Central and Northern Myanmar:

- Central Dry Zone: Mandalay, Magway, and Sagaing
- South 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 focus 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.

2. Objectives

2.1. Objectives of Fish Production survey

- To verify the average fish production from SSA ponds
- To analyze consumed, shared and sold fish by SSA farmers and study how many SSA producers have sold their harvested fish for income generation purposes.

3. Methodology

3.1 Selection of Encoders

Detailed terms of reference (ToR) with clear criteria were developed to hire encoders. The ToR were announced and advertised with the help of the field teams in their respective regions and states. In the selection criteria, an appropriate weightage is given that encoders should know about databases, filling data, analysis, and management of data for agriculture or aquaculture interventions. The encoders were selected with the recommendation of implementing partners (IPs) in their respective townships to ensure support to the encoders by the partners to collect and analyse the data.

[1] https://www.cgiar.org/food-security-impact/one-cgiar/

3.2 Training of Encoders and data analysts

A training session was held with recruited Encoders and data analysts on how to fill farmer record books, capture, and transfer data. The training session took approximately one day. The database was set up on MS Excel. The filling of databases took a different amount of time depending on the number of farmer's record books. To sum up, two (2) encoders and 03 data analysts were hired to fill farmer record books and to complete the database for analysis and report writing.

3.3 Data Collection Method

The farmer record books were initially filled in by SSA farmers. When the books reached the IP offices, staff from the IP made sure the information in the farmer record books is complete and correctly filled. After the encoders and data analysts have verified the data, WorldFish Data Management Specialist and Monitoring and Evaluation (M&E) Coordinator further checked and where necessary asked IPs to complete any missing data, if any. Following this iterative process and after receiving data from IPs again, the data were analysed by the M&E coordinator.

3.4 Respondents Type

Number of participants (beneficiaries) who received fingerlings during *Activity* implementing years and harvested.

Region/Township	Y1	Y2	Y3	# of Participants	# encoders
Kachin					
Bhamo		9	20	29	1
Mansi		16		16	
Mogaung		7	9	16	
Momauk		5	9	14	
Myitkyina		10	12	22	
Waingmaw		54	52	106	
Magway					
Myothit			61	61	1
Ngape		23	41	64	
Pwintbyu		138		138	
Salin		98	115	213	
Seikphyu			19	19	
Mandalay					
Madaya	70	13		83	
Sagaing					
Khin-U	60	5		65	1
Shwebo		300	30	330	
Wetlet		113	71	184	
Shan (East)					
Kengtung			121	121	1
Monghpyak		23		23	
Tachileik		35		35	
Shan (South)					
Hopong		39		39	1
Hsihseng		8		8	
Nansang		116	56	172	
Nyaungshwe		4	59	63	
Pekon		42	30	72	
Pindaya		23	36	59	
Pinlaung		44	22	66	
Taunggyi	142			142	
Grand Total	**272**	**1125**	**763**	**2160**	**5**

Table 1. Number of participants who harvested ponds during the third year of the Activity

3.5 Geographical Focus

The collection of data for production focuses on year-1,2 and 3 farmers (SSA farmers who were provided with fingerlings during *Activity* implementing years Oct 2019 – Sep 2022. In aggregate, twenty-six (26) Townships were considered for the survey, they are; Bhamo, Mogaung, Myitkyina, Waingmaw, Momauk, Mansi, Salin, Ngaphe, Myo Thit, Seik Phyu, Pwintphyu, Shwe Bo, Khin-U, Wetlet, Madaya, Tachileik (Tar Lay), Monghpyak, Keng Tung, Pinlaung, Taunggyi, Pekon, Nansang, Nyaung Shwe, Pindaya, Hopong and Hsihseng.

Figure 1. Map of Townships where ponds were harvested

3.6 Limitations

In some conflict areas the harvesting of ponds was sporadic and erratic as farmers were unable to attend the culture systems continuously. Hence Farmer Record Books (FRBs) are not totally up to date. As a result, it is difficult to disaggregate the harvest details into fish for household consumption, gifts and sold. The information is therefore limited to the total income from harvesting ponds.

4. Results

4.1 Average Pond Size in the regions and states

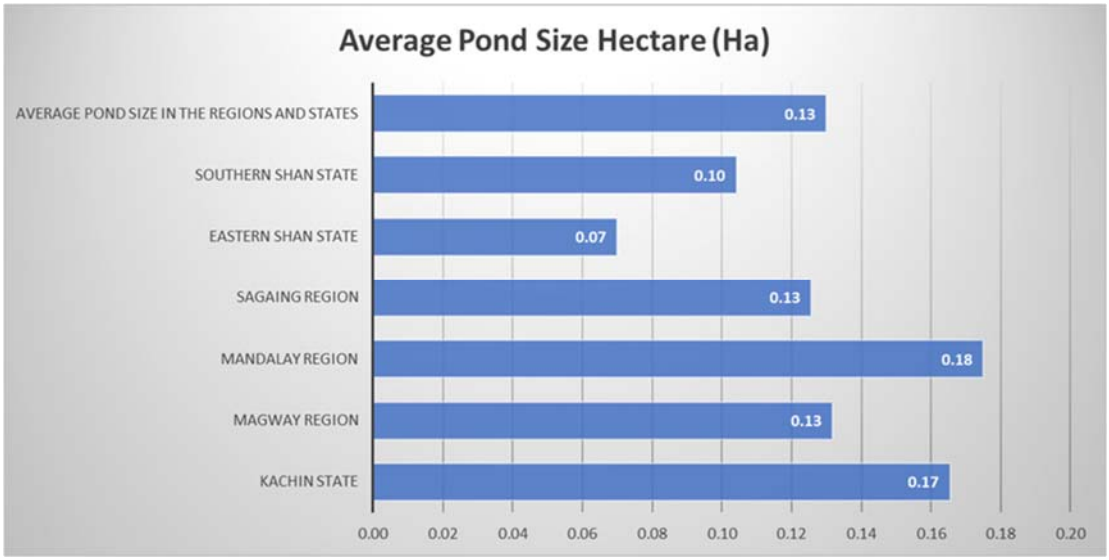

Figure 2. Average Pond Size for regions and states (Hectare (Ha))

According to figure-3, ponds from Mandalay region have a larger area than the other regions and states. In contrast to Mandalay, ponds from eastern Shan have the smallest area followed by southern Shan. The ponds of SSA farmers are 0.13 Hectare (ha) on average. Minimum pond size of SSA farmers is 0.002 Hectare (ha) from Pekon Township and maximum is 0.96 Hectare (ha) from Waingmaw Township.

4.2 Average Production (Kg/Ha) for regions and states

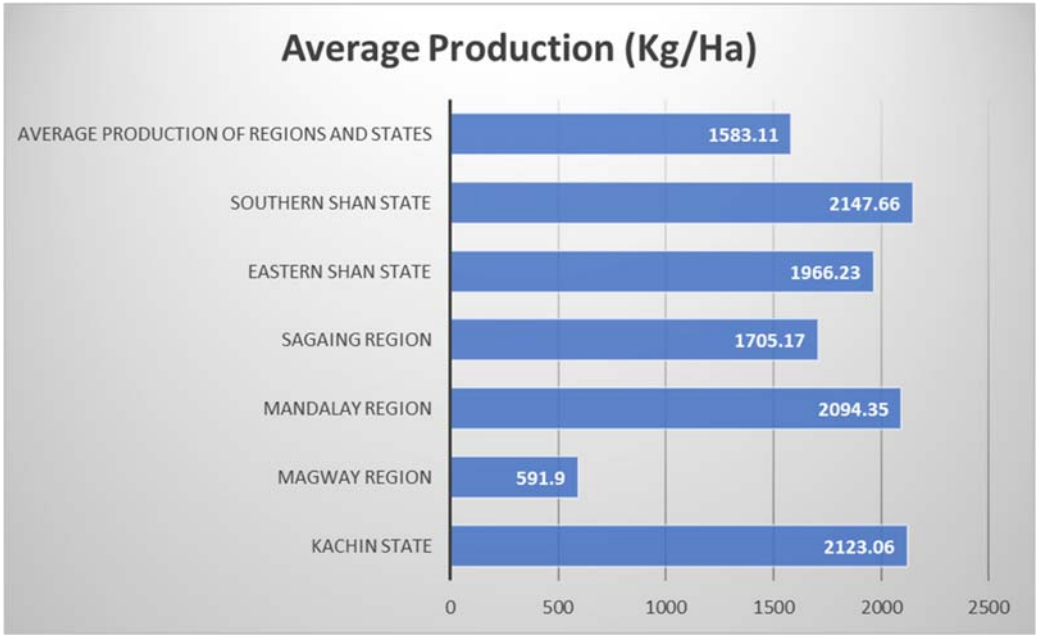

Figure 3. Average Production of Harvested Fish in Kg per hectare

Figure-4 above illustrates the average production of those SSA farmers who had harvested their ponds in each of the Townships. The highest production state is the southern Shan and the lowest is the Magway region. The water retention in Magway area is shorter than the other regions and states and the farmers

from southern Shan area keep fish for more than one year. The average production of all regions and states is reported as 1,583 kg/ha.

4.3 Average Income Earned for regions and states

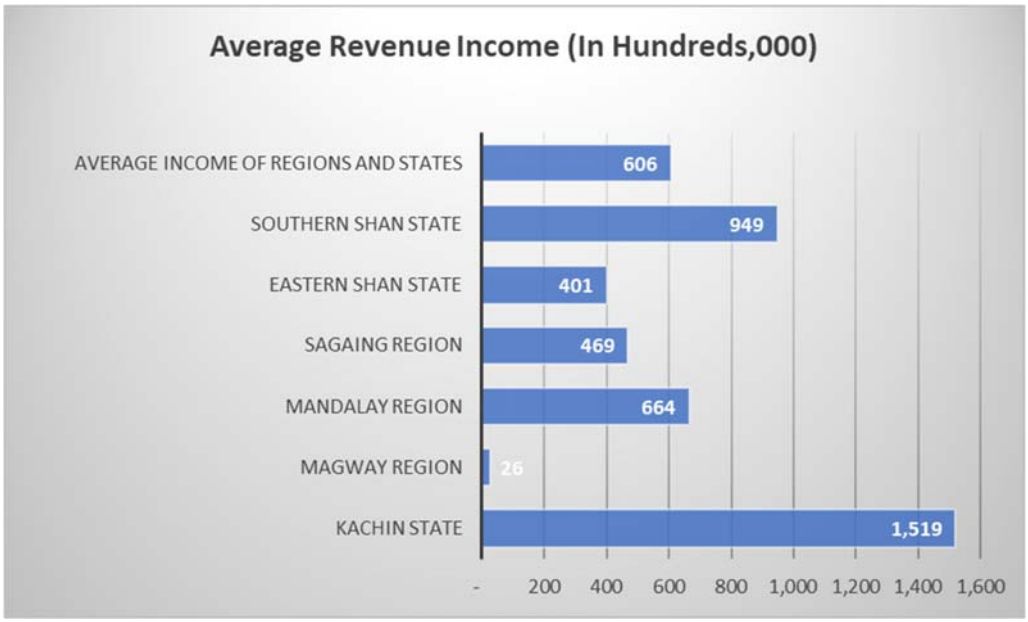

Figure 4. Average Income in Myanmar Kyat[2] for Harvested Fish

Figure five shows that farmers from Kachin state earned more money than the rest of the Townships, and farmers from Magway region earned the least from ponds harvested, whereas farmers from eastern Shan state and Sagaing region earned approximately the same amount of money. It is because the same species of Common carp and Grass Carp got higher price in Kachin and Southern Shan states compared to other regions and states whereas only Tilapia has a higher price in Eastern Shan.

[2] USD1 = MMK 2,080 (2 February, 2024)

4.4 Average Consumption of Fish per Farmer (Kg)

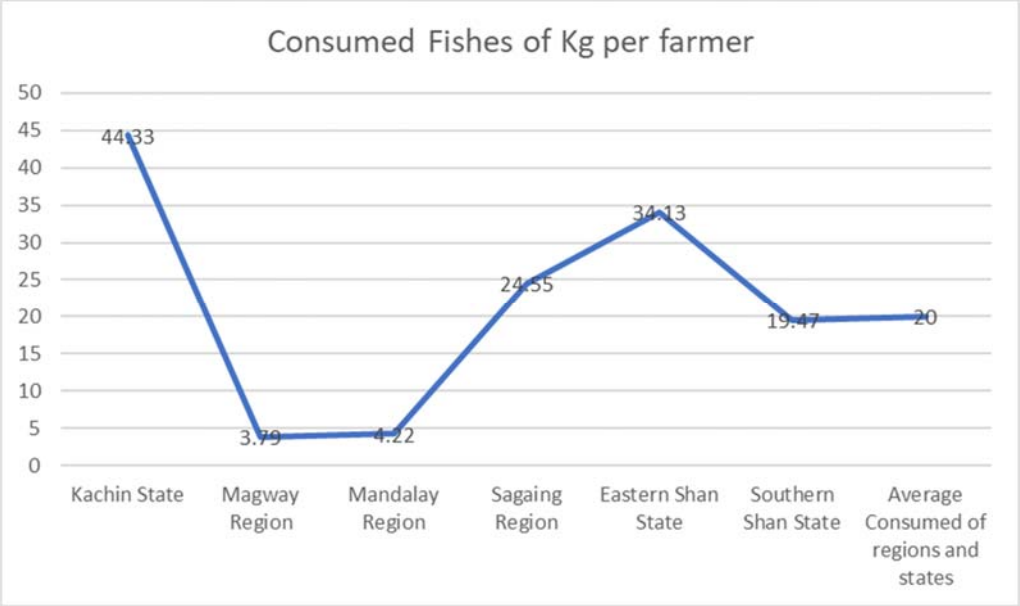

Figure 5. Average Fishes consumed per farmer

Among the 5 regions and states, Kachin state farmers consumed most of their harvested fish per growth season while farmers from Magway and Mandalay regions consumed the least as seen in figure-. 6. Average kilogram (Kg) consumed per farmer is 20 kg.

4.4.1 Farmers Consuming Fish from their own production systems

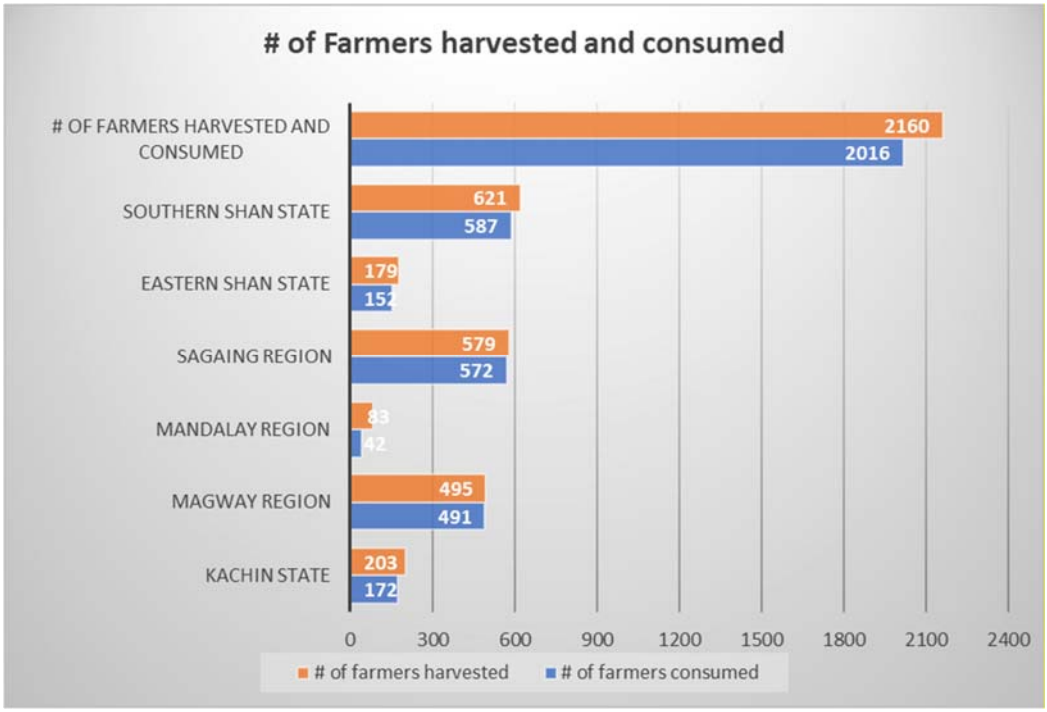

Figure 6. Farmers Consuming Fish in each regions and states

Farmers from Magway and Sagaing regions have consumed more fish than Mandalay and Kachin state. However, there are no significant differences in consumed and harvested fish which means farmers can

access and consume their fish. Overall, 93% of farmers have consumed the fresh fish they attained from their ponds.

4.5 Average weight of fish gifted in the survey area

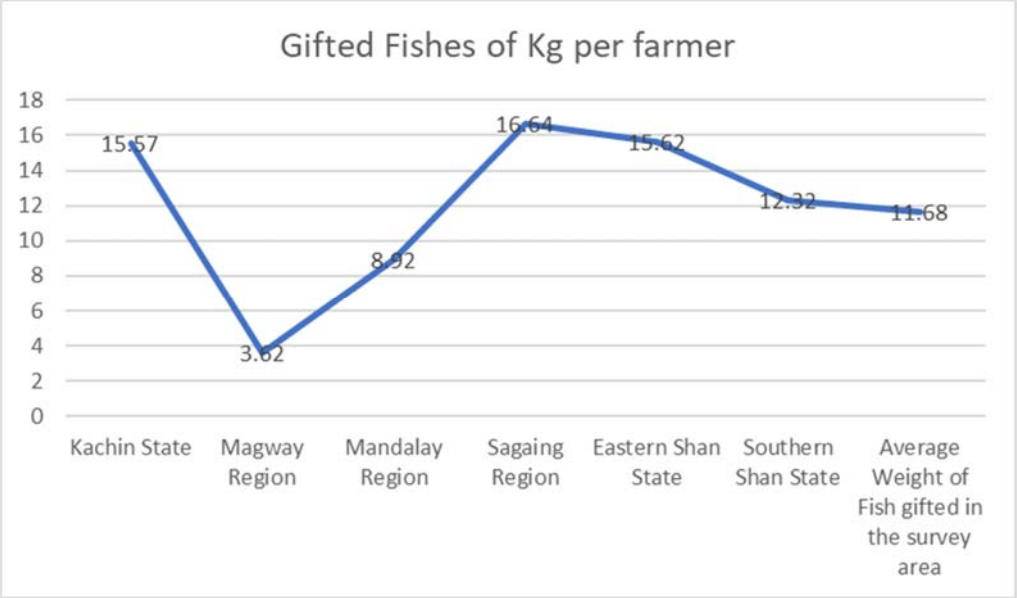

Figure 7. Average Fishes Given as Gifts per farmer.

In figure 8 farmers from the Sagaing region have shared their fish the most, followed by Eastern Shan state. On the contrary, farmers in Magway Region only shared 3 kg per farmer.

4.5.1 Farmers share their fish as a gift

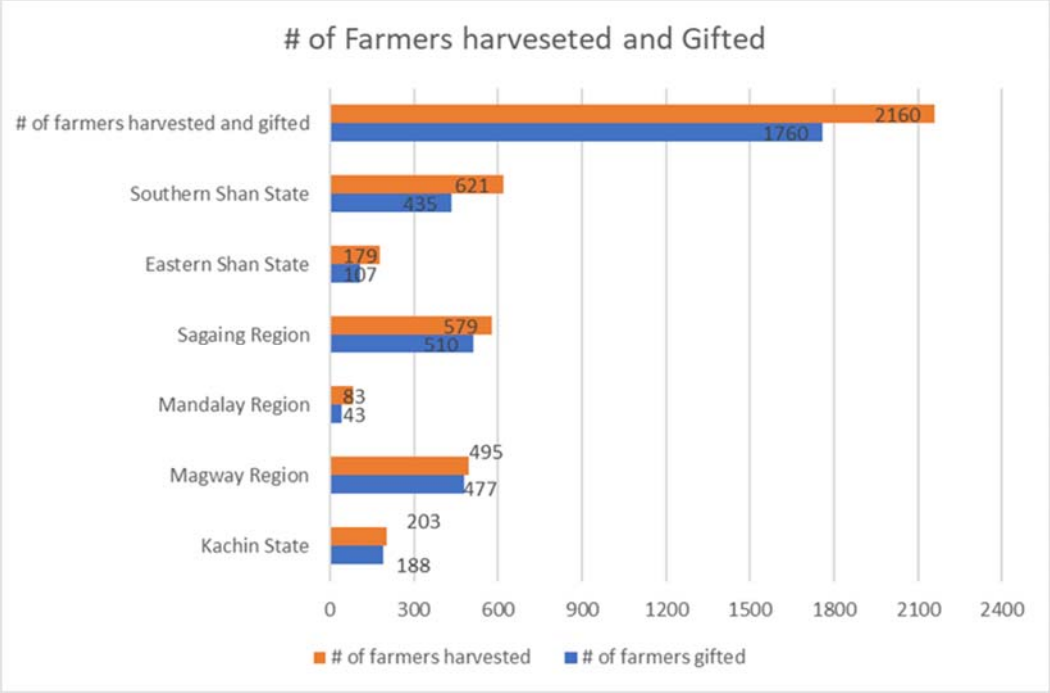

Figure 8. Farmers giving fish as gifts in Regions and States

Figure 9, 96% of farmers from Magway region have gifted 4.44 % (3.62kg) their fish from their ponds while 52% farmers from Mandalay region have gifted the least (1.39%) of fish to family, friends and neighbours. 93% of farmers from Kachin state, 88% of farmers from Sagaing and 70% farmers from Southern Shan state have gifted 4.34%, 7.17% and 4.91 % of their fish respectively. Farmers from eastern Shan shared the most 8.03% of fish from their total harvested. Overall, 81% of farmers have gifted around 30.27 % of fish from their ponds.

4.6 Average total weight (kg) fish sold by farmers by regions and states

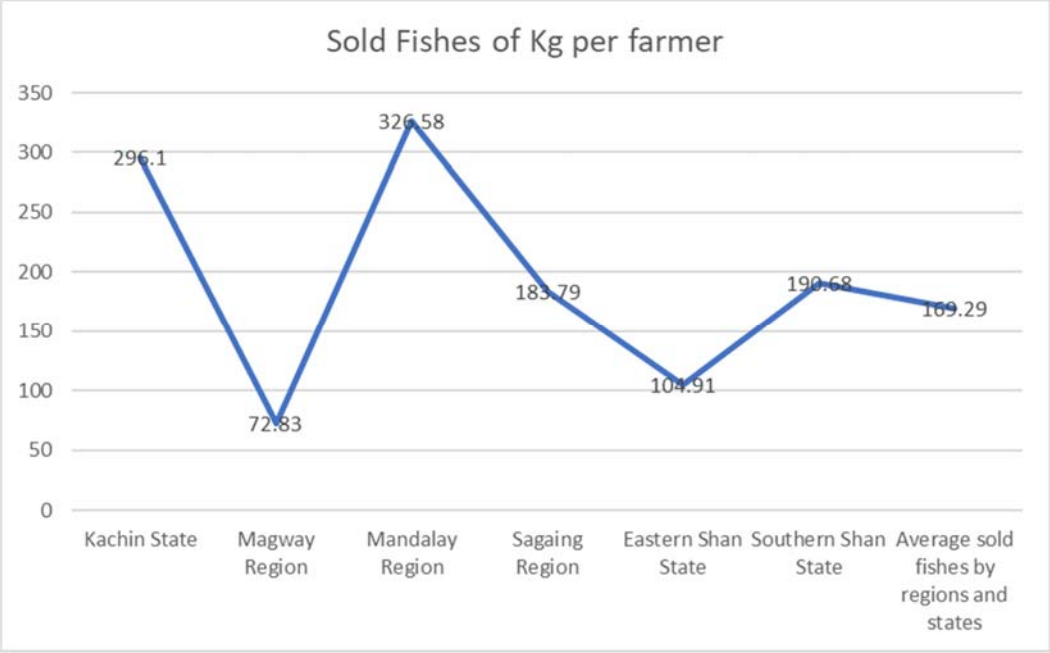

Figure 9. Average* total weight of fish *sold per farmer by State/Region

Figure10 indicates that farmers from Mandalay have sold most fish, followed by those in Kachin. In contrast, farmers from Magway sold the least.

4.6.1 Farmers marketing fish

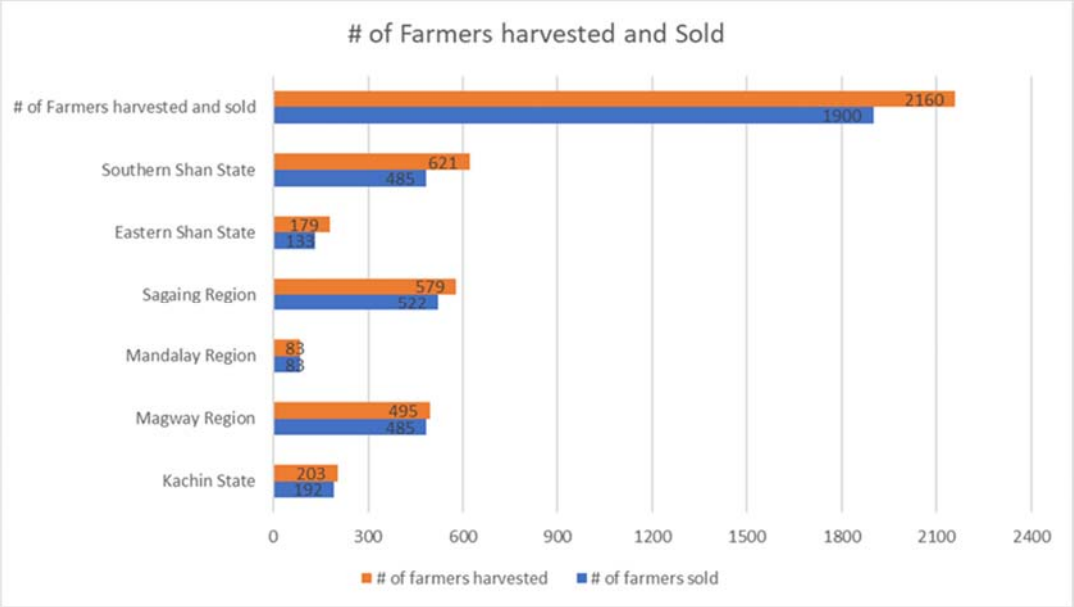

Figure 10. Farmers marketing fish in Regions and States

Figure 11 shows that 100% of farmers from Mandalay region have sold fish from their ponds, followed by Magway region with 98%. Whereas 95% of farmers from Kachin and 90% of farmers from Sagaing region marketed fish. 78% of farmers from southern Shan state and 74% of farmers from eastern Shan state sold fish less compared with other regions and states. An average of 88% of farmers sold their harvested fish among 348 farmers.

5. Findings

- According to the data, farmers from southern Shan state have reported highest production levels than the rest of the states and regions.

- Farmers from southern Shan produced most though they have less pond area. The farmers from Kachin state make more money than the rest. It was because of the different fish prices. Fish prices in Kachin are higher than that of other states and regions.

- Although ponds areas from Kachin and Mandalay are larger than the rest of the regions and states, Southern Shan have produced more fish than the others, followed by Kachin and Mandalay. It is because most of the ponds in southern Shan are harvested after a significant duration, in some cases as long as one and half years.

- According to the analyses, 93% of farmers consumed a proportion of their fish and 88% of farmers sold a proportion of their production.

- A small number of farmers from Magway region consume fish from their ponds. On the contrary, farmers from Kachin state have the highest number consuming part of their production.

- All farmers from Mandalay region sold a proportion of their fish. Over 90% of farmers from other regions and states also sold some of their fish except eastern and southern Shan state.

- Farmers from Magway region had the lowest fish yields and had the lowest incomes from aquaculture due to water scarcity and small pond size in the Central Dry Zone of Myanmar.

- This study shows that fewer farmers sold fish this year compared to last.

6. Recommendations

- According to the study findings, farmer exchange visits are an effective method of sharing knowledge about clustered fish production and marketing.

- In Kachin State some pond owners encourage customers to catch their own fish. This reduces harvesting costs and yields higher prices. The buyers also receive better quality fresh fish.

- Since Feed the Future Burma Fish for Livelihoods *Activity* also enhances nutritional support, the fact that 93% of farmers consumed part of their production is encouraging.

- At the time of transcribing data from Farmers Record Books (FRBs) to the database, documentation issues were less than the previous years. However, fish selling practices are varied with many issues regarding the recording of data found. Hence partners and field teams should promote the taking of accurate notes to capture correct income for selling fish and build the capacity of the SSA farmers and field staff, where necessary.

- Adequate time needs to be given to the process of data capture from Farmer Record Books. Ideally implementing partners and their WorldFish colleagues operating in the field should check for significant data variances before the monitoring team analyses the data.

Annexes

1. Average Production in Kg

Average Production in Kg			
Townships			Average
	Bhamo	Size of aquaculture ponds (acre)	0.34
		Size of aquaculture ponds (Ha)	0.13
		Pond Yield (Kg/acre)	906.61
		Pond Yield (Kg/ha)	2266.53
	Mansi	Size of aquaculture ponds (acre)	0.29
		Size of aquaculture ponds (Ha)	0.12
		Pond Yield (Kg/acre)	851.04
		Pond Yield (Kg/ha)	2127.60
	Mogaung	Size of aquaculture ponds (acre)	0.23
		Size of aquaculture ponds (Ha)	0.09
		Pond Yield (Kg/acre)	1006.60
		Pond Yield (Kg/ha)	2516.51
	Momauk	Size of aquaculture ponds (acre)	0.23
		Size of aquaculture ponds (Ha)	0.09
		Pond Yield (Kg/acre)	1097.78
		Pond Yield (Kg/ha)	2744.45
	Myitkyina	Size of aquaculture ponds (acre)	0.44
		Size of aquaculture ponds (Ha)	0.18
		Pond Yield (Kg/acre)	838.13
		Pond Yield (Kg/ha)	2095.32
	Waingmaw	Size of aquaculture ponds (acre)	0.49
		Size of aquaculture ponds (Ha)	0.20
		Pond Yield (Kg/acre)	814.69
		Pond Yield (Kg/ha)	2036.73
	Myothit	Size of aquaculture ponds (acre)	0.39
		Size of aquaculture ponds (Ha)	0.15
		Pond Yield (Kg/acre)	156.92
		Pond Yield (Kg/ha)	345.58
	Ngaphe	Size of aquaculture ponds (acre)	0.21
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	259.08
		Pond Yield (Kg/ha)	647.70
	Pwintphyu	Size of aquaculture ponds (acre)	0.21
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	289.96
		Pond Yield (Kg/ha)	724.90
	Salin	Size of aquaculture ponds (acre)	0.46
		Size of aquaculture ponds (Ha)	0.18
		Pond Yield (Kg/acre)	248.82
		Pond Yield (Kg/ha)	622.06
	Seikphyu	Size of aquaculture ponds (acre)	0.29
		Size of aquaculture ponds (Ha)	0.12
		Pond Yield (Kg/acre)	129.45
		Pond Yield (Kg/ha)	323.63

Townships	Madaya	Size of aquaculture ponds (acre)	0.46
		Size of aquaculture ponds (Ha)	0.18
		Pond Yield (Kg/acre)	837.74
		Pond Yield (Kg/ha)	2094.35
	Khin U	Size of aquaculture ponds (acre)	0.50
		Size of aquaculture ponds (Ha)	0.20
		Pond Yield (Kg/acre)	1408.14
		Pond Yield (Kg/ha)	3520.35
	Shwebo	Size of aquaculture ponds (acre)	0.37
		Size of aquaculture ponds (Ha)	0.15
		Pond Yield (Kg/acre)	456.90
		Pond Yield (Kg/ha)	1142.24
	Wetlet	Size of aquaculture ponds (acre)	0.15
		Size of aquaculture ponds (Ha)	0.06
		Pond Yield (Kg/acre)	803.95
		Pond Yield (Kg/ha)	2009.88
	Kengtung	Size of aquaculture ponds (acre)	0.19
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	933.44
		Pond Yield (Kg/ha)	2333.60
	Monghpyak	Size of aquaculture ponds (acre)	0.20
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	427.13
		Pond Yield (Kg/ha)	1067.83
	Tachileik	Size of aquaculture ponds (acre)	0.15
		Size of aquaculture ponds (Ha)	0.06
		Pond Yield (Kg/acre)	494.37
		Pond Yield (Kg/ha)	1235.92
	Hopong	Size of aquaculture ponds (acre)	0.27
		Size of aquaculture ponds (Ha)	0.11
		Pond Yield (Kg/acre)	971.73
		Pond Yield (Kg/ha)	2429.32
	Hsihseng	Size of aquaculture ponds (acre)	0.82
		Size of aquaculture ponds (Ha)	0.33
		Pond Yield (Kg/acre)	182.53
		Pond Yield (Kg/ha)	456.31
	Nansang	Size of aquaculture ponds (acre)	0.43
		Size of aquaculture ponds (Ha)	0.17
		Pond Yield (Kg/acre)	983.46
		Pond Yield (Kg/ha)	2458.65
	Nyaungshwe	Size of aquaculture ponds (acre)	0.28
		Size of aquaculture ponds (Ha)	0.11
		Pond Yield (Kg/acre)	247.33
		Pond Yield (Kg/ha)	618.33
	Pekon	Size of aquaculture ponds (acre)	0.14
		Size of aquaculture ponds (Ha)	0.05
		Pond Yield (Kg/acre)	840.41
		Pond Yield (Kg/ha)	2101.03

Townships	Pindaya	Size of aquaculture ponds (acre)	0.19
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	820.09
		Pond Yield (Kg/ha)	2050.23
	Pinlaung	Size of aquaculture ponds (acre)	0.05
		Size of aquaculture ponds (Ha)	0.02
		Pond Yield (Kg/acre)	2074.80
		Pond Yield (Kg/ha)	5187.00
	Taunggyi	Size of aquaculture ponds (acre)	0.05
		Size of aquaculture ponds (Ha)	0.02
		Pond Yield (Kg/acre)	1235.13
		Pond Yield (Kg/ha)	3087.82
	Total	Size of aquaculture ponds (acre)	604.07
		Size of aquaculture ponds (Ha)	241.63
		Pond Yield (Kg/acre)	633.25
		Pond Yield (Kg/ha)	1583.11

2. Consumed Fish in Kg

Excluding farmers without consumed fishes			
Townships	Average		
	Bhamo	Size of aquaculture ponds (acre)	0.28
		Size of aquaculture ponds (Ha)	0.11
		Pond Yield (Kg/acre)	47.30
		Pond Yield (Kg/ha)	118.26
	Mansi	Size of aquaculture ponds (acre)	0.33
		Size of aquaculture ponds (Ha)	0.13
		Pond Yield (Kg/acre)	32.35
		Pond Yield (Kg/ha)	80.87
	Mogaung	Size of aquaculture ponds (acre)	0.21
		Size of aquaculture ponds (Ha)	0.09
		Pond Yield (Kg/acre)	51.94
		Pond Yield (Kg/ha)	129.84
	Momauk	Size of aquaculture ponds (acre)	0.27
		Size of aquaculture ponds (Ha)	0.11
		Pond Yield (Kg/acre)	32.57
		Pond Yield (Kg/ha)	81.43
	Myitkyina	Size of aquaculture ponds (acre)	0.37
		Size of aquaculture ponds (Ha)	0.15
		Pond Yield (Kg/acre)	30.96
		Pond Yield (Kg/ha)	77.39
	Waingmaw	Size of aquaculture ponds (acre)	0.49
		Size of aquaculture ponds (Ha)	0.20
		Pond Yield (Kg/acre)	137.72
		Pond Yield (Kg/ha)	344.30
	Myothit	Size of aquaculture ponds (acre)	0.38
		Size of aquaculture ponds (Ha)	0.15
		Pond Yield (Kg/acre)	9.89
		Pond Yield (Kg/ha)	24.73
	Ngaphe	Size of aquaculture ponds (acre)	0.20
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	22.02
		Pond Yield (Kg/ha)	55.05
	Pwintphyu	Size of aquaculture ponds (acre)	0.21
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	14.99
		Pond Yield (Kg/ha)	37.47
	Salin	Size of aquaculture ponds (acre)	0.45
		Size of aquaculture ponds (Ha)	0.18
		Pond Yield (Kg/acre)	8.96
		Pond Yield (Kg/ha)	22.39
	Seikphyu	Size of aquaculture ponds (acre)	0.28
		Size of aquaculture ponds (Ha)	0.11
		Pond Yield (Kg/acre)	16.78
		Pond Yield (Kg/ha)	41.95

Townships	Madaya	Size of aquaculture ponds (acre)	0.51
		Size of aquaculture ponds (Ha)	0.21
		Pond Yield (Kg/acre)	8.22
		Pond Yield (Kg/ha)	20.55
	Khin U	Size of aquaculture ponds (acre)	0.50
		Size of aquaculture ponds (Ha)	0.20
		Pond Yield (Kg/acre)	13.75
		Pond Yield (Kg/ha)	34.37
	Shwebo	Size of aquaculture ponds (acre)	0.37
		Size of aquaculture ponds (Ha)	0.15
		Pond Yield (Kg/acre)	94.59
		Pond Yield (Kg/ha)	236.49
	Wetlet	Size of aquaculture ponds (acre)	0.12
		Size of aquaculture ponds (Ha)	0.05
		Pond Yield (Kg/acre)	1876.96
		Pond Yield (Kg/ha)	4692.40
	Kengtung	Size of aquaculture ponds (acre)	0.17
		Size of aquaculture ponds (Ha)	0.07
		Pond Yield (Kg/acre)	244.77
		Pond Yield (Kg/ha)	611.93
	Monghpyak	Size of aquaculture ponds (acre)	0.19
		Size of aquaculture ponds (Ha)	0.07
		Pond Yield (Kg/acre)	64.97
		Pond Yield (Kg/ha)	162.42
	Tachileik	Size of aquaculture ponds (acre)	0.14
		Size of aquaculture ponds (Ha)	0.06
		Pond Yield (Kg/acre)	368.31
		Pond Yield (Kg/ha)	920.77
	Hopong	Size of aquaculture ponds (acre)	0.26
		Size of aquaculture ponds (Ha)	0.10
		Pond Yield (Kg/acre)	91.88
		Pond Yield (Kg/ha)	229.70
	Nansang	Size of aquaculture ponds (acre)	0.43
		Size of aquaculture ponds (Ha)	0.17
		Pond Yield (Kg/acre)	28.84
		Pond Yield (Kg/ha)	72.09
	Nyaungshwe	Size of aquaculture ponds (acre)	0.28
		Size of aquaculture ponds (Ha)	0.11
		Pond Yield (Kg/acre)	24.12
		Pond Yield (Kg/ha)	60.30
	Pekon	Size of aquaculture ponds (acre)	0.11
		Size of aquaculture ponds (Ha)	0.04
		Pond Yield (Kg/acre)	171.34
		Pond Yield (Kg/ha)	428.35

Townships	Pindaya	Size of aquaculture ponds (acre)	0.19
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	97.90
		Pond Yield (Kg/ha)	244.76
	Pinlaung	Size of aquaculture ponds (acre)	0.05
		Size of aquaculture ponds (Ha)	0.02
		Pond Yield (Kg/acre)	1165.96
		Pond Yield (Kg/ha)	2914.90
	Taunggyi	Size of aquaculture ponds (acre)	0.05
		Size of aquaculture ponds (Ha)	0.02
		Pond Yield (Kg/acre)	382.09
		Pond Yield (Kg/ha)	955.22
	Total	Size of aquaculture ponds (acre)	563.21
		Size of aquaculture ponds (Ha)	225.28
		Pond Yield (Kg/acre)	143.15
		Pond Yield (Kg/ha)	357.88

3. Shared Fish in Kg

Excluding farmers without shared fishes			
Townships	Average		
	Bhamo	Size of aquaculture ponds (acre)	0.37
		Size of aquaculture ponds (Ha)	0.15
		Pond Yield (Kg/acre)	34.41
		Pond Yield (Kg/ha)	86.03
	Mansi	Size of aquaculture ponds (acre)	0.28
		Size of aquaculture ponds (Ha)	0.11
		Pond Yield (Kg/acre)	35.14
		Pond Yield (Kg/ha)	87.84
	Mogaung	Size of aquaculture ponds (acre)	0.25
		Size of aquaculture ponds (Ha)	0.10
		Pond Yield (Kg/acre)	42.79
		Pond Yield (Kg/ha)	106.99
	Momauk	Size of aquaculture ponds (acre)	0.20
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	49.00
		Pond Yield (Kg/ha)	122.51
	Myitkyina	Size of aquaculture ponds (acre)	0.49
		Size of aquaculture ponds (Ha)	0.19
		Pond Yield (Kg/acre)	26.83
		Pond Yield (Kg/ha)	67.09
	Waingmaw	Size of aquaculture ponds (acre)	0.49
		Size of aquaculture ponds (Ha)	0.20
		Pond Yield (Kg/acre)	40.63
		Pond Yield (Kg/ha)	101.58
	Myothit	Size of aquaculture ponds (acre)	0.40
		Size of aquaculture ponds (Ha)	0.16
		Pond Yield (Kg/acre)	13.83
		Pond Yield (Kg/ha)	34.58
	Ngaphe	Size of aquaculture ponds (acre)	0.23
		Size of aquaculture ponds (Ha)	0.09
		Pond Yield (Kg/acre)	20.82
		Pond Yield (Kg/ha)	52.06
	Pwintphyu	Size of aquaculture ponds (acre)	0.20
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	15.20
		Pond Yield (Kg/ha)	38.00
	Salin	Size of aquaculture ponds (acre)	0.45
		Size of aquaculture ponds (Ha)	0.18
		Pond Yield (Kg/acre)	6.93
		Pond Yield (Kg/ha)	17.32
	Seikphyu	Size of aquaculture ponds (acre)	0.29
		Size of aquaculture ponds (Ha)	0.12
		Pond Yield (Kg/acre)	20.32
		Pond Yield (Kg/ha)	50.79

Townships	Madaya	Size of aquaculture ponds (acre)	0.51
		Size of aquaculture ponds (Ha)	0.21
		Pond Yield (Kg/acre)	17.38
		Pond Yield (Kg/ha)	43.46
	Khin U	Size of aquaculture ponds (acre)	0.50
		Size of aquaculture ponds (Ha)	0.20
		Pond Yield (Kg/acre)	10.29
		Pond Yield (Kg/ha)	25.72
	Shwebo	Size of aquaculture ponds (acre)	0.37
		Size of aquaculture ponds (Ha)	0.15
		Pond Yield (Kg/acre)	62.66
		Pond Yield (Kg/ha)	156.65
	Wetlet	Size of aquaculture ponds (acre)	0.18
		Size of aquaculture ponds (Ha)	0.07
		Pond Yield (Kg/acre)	44.28
		Pond Yield (Kg/ha)	110.70
	Kengtung	Size of aquaculture ponds (acre)	0.21
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	100.22
		Pond Yield (Kg/ha)	250.55
	Monghpyak	Size of aquaculture ponds (acre)	0.21
		Size of aquaculture ponds (Ha)	0.09
		Pond Yield (Kg/acre)	106.83
		Pond Yield (Kg/ha)	267.07
	Tachileik	Size of aquaculture ponds (acre)	0.17
		Size of aquaculture ponds (Ha)	0.07
		Pond Yield (Kg/acre)	43.33
		Pond Yield (Kg/ha)	108.34
	Hopong	Size of aquaculture ponds (acre)	0.27
		Size of aquaculture ponds (Ha)	0.11
		Pond Yield (Kg/acre)	54.51
		Pond Yield (Kg/ha)	136.27
	Nansang	Size of aquaculture ponds (acre)	0.46
		Size of aquaculture ponds (Ha)	0.18
		Pond Yield (Kg/acre)	18.20
		Pond Yield (Kg/ha)	45.50
	Nyaungshwe	Size of aquaculture ponds (acre)	0.26
		Size of aquaculture ponds (Ha)	0.10
		Pond Yield (Kg/acre)	16.55
		Pond Yield (Kg/ha)	41.37
	Pekon	Size of aquaculture ponds (acre)	0.18
		Size of aquaculture ponds (Ha)	0.07
		Pond Yield (Kg/acre)	100.82
		Pond Yield (Kg/ha)	252.05

Townships	Pindaya	Size of aquaculture ponds (acre)	0.19
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	50.09
		Pond Yield (Kg/ha)	125.23
	Pinlaung	Size of aquaculture ponds (acre)	0.05
		Size of aquaculture ponds (Ha)	0.02
		Pond Yield (Kg/acre)	544.83
		Pond Yield (Kg/ha)	1362.07
	Taunggyi	Size of aquaculture ponds (acre)	0.05
		Size of aquaculture ponds (Ha)	0.02
		Pond Yield (Kg/acre)	270.00
		Pond Yield (Kg/ha)	674.99
	Total	Size of aquaculture ponds (acre)	537.27
		Size of aquaculture ponds (Ha)	214.91
		Pond Yield (Kg/acre)	38.27
		Pond Yield (Kg/ha)	95.67

4. Average Sold Fish in Kg

Excluding farmers without sold fishes			
Townships	Average		
	Bhamo	Size of aquaculture ponds (acre)	0.34
		Size of aquaculture ponds (Ha)	0.13
		Pond Yield (Kg/acre)	859.15
		Pond Yield (Kg/ha)	2147.88
	Mansi	Size of aquaculture ponds (acre)	0.28
		Size of aquaculture ponds (Ha)	0.11
		Pond Yield (Kg/acre)	804.52
		Pond Yield (Kg/ha)	2011.31
	Mogaung	Size of aquaculture ponds (acre)	0.22
		Size of aquaculture ponds (Ha)	0.09
		Pond Yield (Kg/acre)	935.44
		Pond Yield (Kg/ha)	2338.59
	Momauk	Size of aquaculture ponds (acre)	0.23
		Size of aquaculture ponds (Ha)	0.09
		Pond Yield (Kg/acre)	1045.01
		Pond Yield (Kg/ha)	2612.52
	Myitkyina	Size of aquaculture ponds (acre)	0.48
		Size of aquaculture ponds (Ha)	0.19
		Pond Yield (Kg/acre)	796.46
		Pond Yield (Kg/ha)	1991.14
	Waingmaw	Size of aquaculture ponds (acre)	0.50
		Size of aquaculture ponds (Ha)	0.20
		Pond Yield (Kg/acre)	644.01
		Pond Yield (Kg/ha)	1610.01
	Myothit	Size of aquaculture ponds (acre)	0.38
		Size of aquaculture ponds (Ha)	0.15
		Pond Yield (Kg/acre)	116.11
		Pond Yield (Kg/ha)	290.28
	Ngaphe	Size of aquaculture ponds (acre)	0.20
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	221.17
		Pond Yield (Kg/ha)	552.93
	Pwintphyu	Size of aquaculture ponds (acre)	0.21
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	262.77
		Pond Yield (Kg/ha)	656.92
	Salin	Size of aquaculture ponds (acre)	0.46
		Size of aquaculture ponds (Ha)	0.18
		Pond Yield (Kg/acre)	233.21
		Pond Yield (Kg/ha)	583.02
	Seikphyu	Size of aquaculture ponds (acre)	0.30
		Size of aquaculture ponds (Ha)	0.12
		Pond Yield (Kg/acre)	96.99
		Pond Yield (Kg/ha)	242.48

Townships	Madaya	Size of aquaculture ponds (acre)	0.40
		Size of aquaculture ponds (Ha)	0.16
		Pond Yield (Kg/acre)	820.76
		Pond Yield (Kg/ha)	2051.91
	Khin U	Size of aquaculture ponds (acre)	0.50
		Size of aquaculture ponds (Ha)	0.20
		Pond Yield (Kg/acre)	1386.34
		Pond Yield (Kg/ha)	3465.85
	Shwebo	Size of aquaculture ponds (acre)	0.38
		Size of aquaculture ponds (Ha)	0.15
		Pond Yield (Kg/acre)	304.19
		Pond Yield (Kg/ha)	760.48
	Wetlet	Size of aquaculture ponds (acre)	0.15
		Size of aquaculture ponds (Ha)	0.06
		Pond Yield (Kg/acre)	716.59
		Pond Yield (Kg/ha)	1791.48
	Kengtung	Size of aquaculture ponds (acre)	0.20
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	812.73
		Pond Yield (Kg/ha)	2031.82
	Monghpyak	Size of aquaculture ponds (acre)	0.22
		Size of aquaculture ponds (Ha)	0.09
		Pond Yield (Kg/acre)	275.63
		Pond Yield (Kg/ha)	689.09
	Tachileik	Size of aquaculture ponds (acre)	0.16
		Size of aquaculture ponds (Ha)	0.06
		Pond Yield (Kg/acre)	127.70
		Pond Yield (Kg/ha)	319.25
	Hopong	Size of aquaculture ponds (acre)	0.29
		Size of aquaculture ponds (Ha)	0.11
		Pond Yield (Kg/acre)	895.25
		Pond Yield (Kg/ha)	2238.13
	Hsihseng	Size of aquaculture ponds (acre)	0.83
		Size of aquaculture ponds (Ha)	0.33
		Pond Yield (Kg/acre)	200.75
		Pond Yield (Kg/ha)	501.87
	Nansang	Size of aquaculture ponds (acre)	0.40
		Size of aquaculture ponds (Ha)	0.16
		Pond Yield (Kg/acre)	945.22
		Pond Yield (Kg/ha)	2363.06
	Nyaungshwe	Size of aquaculture ponds (acre)	0.29
		Size of aquaculture ponds (Ha)	0.11
		Pond Yield (Kg/acre)	213.99
		Pond Yield (Kg/ha)	534.98

Townships	Pekon	Size of aquaculture ponds (acre)	0.16
		Size of aquaculture ponds (Ha)	0.06
		Pond Yield (Kg/acre)	605.18
		Pond Yield (Kg/ha)	1512.96
	Pindaya	Size of aquaculture ponds (acre)	0.19
		Size of aquaculture ponds (Ha)	0.08
		Pond Yield (Kg/acre)	759.00
		Pond Yield (Kg/ha)	1897.49
	Pinlaung	Size of aquaculture ponds (acre)	0.07
		Size of aquaculture ponds (Ha)	0.03
		Pond Yield (Kg/acre)	615.70
		Pond Yield (Kg/ha)	1539.26
	Taunggyi	Size of aquaculture ponds (acre)	0.07
		Size of aquaculture ponds (Ha)	0.03
		Pond Yield (Kg/acre)	1108.77
		Pond Yield (Kg/ha)	2771.93
	Total	Size of aquaculture ponds (acre)	588.65
		Size of aquaculture ponds (Ha)	235.46
		Pond Yield (Kg/acre)	546.54
		Pond Yield (Kg/ha)	1366.35

www.worldfishcenter.org