RIN Online Workshop II

“ Effect of Post Harvest Handling Practices in Inshore Fisheries (Case Study: Ngapudaw Township, Ayeyarwady Region, Myanmar)

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Introduction

Why Fishery sector is important ?

Fishing industry helps reduce **poverty**, increases **income**, and improves **food security** (FAO, 2008). Offers **economic opportunities** and is crucial for **rural livelihoods**.

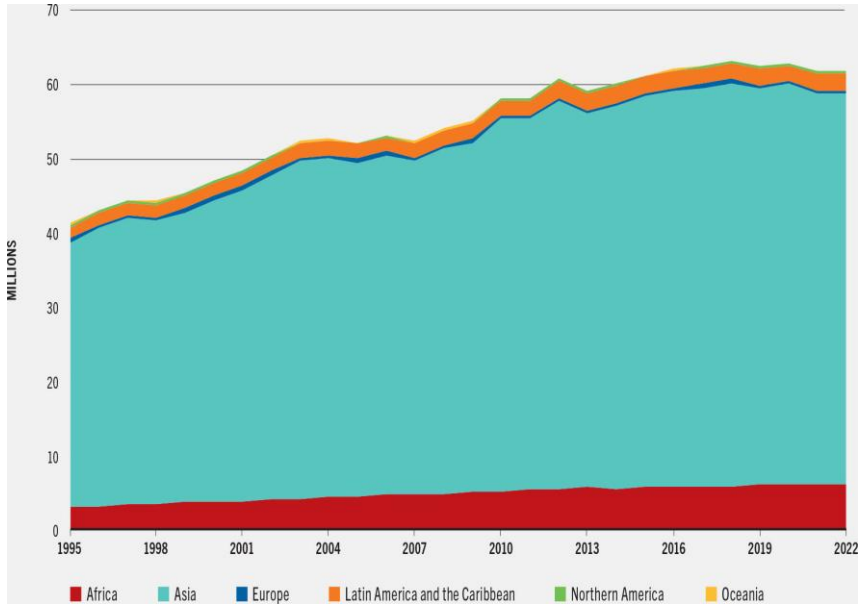
Employment Opportunity

- **Total Employment:** estimated 61.8 million people were engaged as full-time, part-time.
- **Asia's employment :** 85% , **Capture Fisheries Share:** 54%

Food Security

- Aquatic foods rich in omega-3 fatty acids and micronutrients are affordable for marginalized rural populations .
- Over **3 billion people** rely on fish for 20% of their animal protein intake.

FIGURE 28 EMPLOYMENT IN THE PRIMARY SECTOR OF FISHERIES AND AQUACULTURE BY GEOGRAPHICAL REGION, 1995–2022



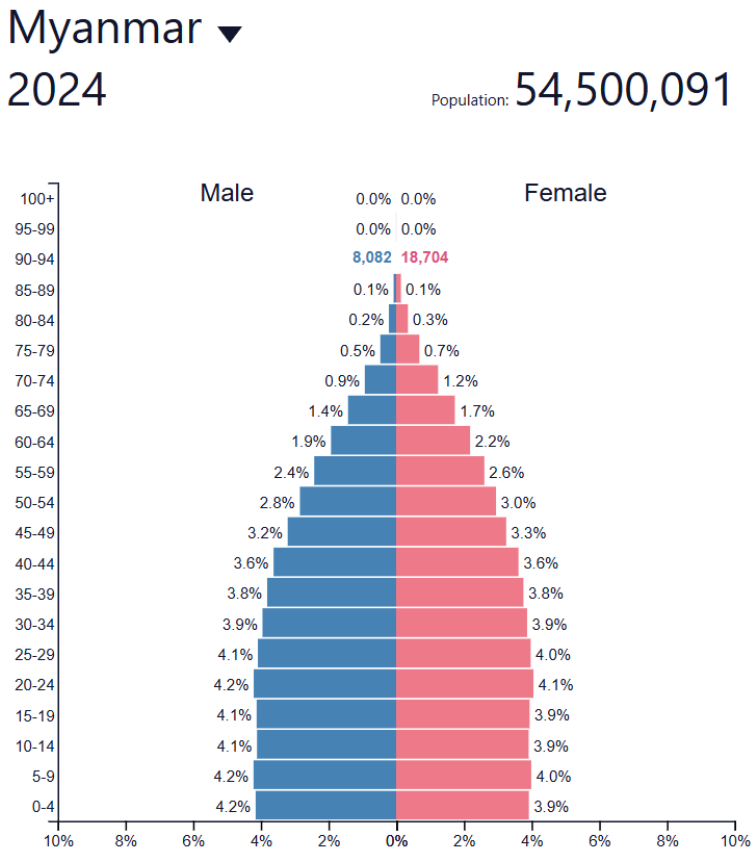
Introduction

Importance of Fishery Sector in Myanmar

- The current population of **Myanmar** is 54.890 million (2024 Census Data) and **65.87%** of the population are living in **rural area.** Ayeyarwady Region has the largest proportion with **84% are** living in **rural areas.**
- The fisheries sector employs - approximately **3.2 million people.** (by Worldfish)
- Fisheries exports reached around **USD 422 million**, **393,000 tons** exported during the fiscal year (April 2024 – March 2025). Inland and marine fisheries together contribute nearly **65%** of the country's total fish production.
- Myanmar's overall GDP in 2024 was approximately $61.18 billion and fishery sector contributed 2% to country GDP.

Regional Level Contribution

- **Ayeyarwady** Region plays a vital role in Myanmar's fisheries, especially in inland capture and aquaculture.
- In 2022-2023, Myanmar produced about (**5.657 million metric tons**) , and Ayeyarwady contributed for a large share (**1.9 million metric tons**) in 2023. (Central Statics Organization)



Introduction

Challenges and Sustainability

- ❑ Rapid degradation of fish populations
- ❑ Globally, estimates that about 35% of total harvest is lost or wasted annually.
- ❑ Significant post-harvest losses and waste in fisheries supply chains.

Post-Harvest Fish Loss (PHFL)

- **Physical loss**: fish are stolen, spoilt, or thrown away. Predatory activity
- **Quality loss**: not kept cold enough or unhygienic conditions.
- **Market loss**: price decreases because of the fluctuating supply and demand in the market.

- ❑ Causes are inadequate cold storage facilities, inefficient transportation, technological gaps and lack of training for fishery workers.

- ❑ Effect - Fishers earn less due to freshness was **grade down** and **low selling price**
- ❑ (SEAFDEC) and ASEAN have developed regional guidelines aligned with the FAO's Code of Conduct for Responsible Fisheries which emphasize hygiene, proper chilling, and training in capture and aquaculture practices.(SEAFDEC, 2005; ASEAN, n.d.).

Introduction

Challenges of Fishery Sector in Myanmar

- ❑ Marine capture has declined due to overfishing and environmental stress.
- ❑ Weakness of law enforcement, no specific guideline for SSF, not regular monitoring.
- ❑ Weak adoption of fish quality and safety regulations.
- ❑ Poor data recording and management systems, poor infrastructure (including storage and transportation facilities,) and less of applying proper handling practices.
- ❑ Limited research in **Myanmar** focused specifically on **post-harvest handling** in **small-scale fisheries**

Objective of the Study

- ***The Objectives of Study are:***
  - To examine in the current post-harvest handling practices of inshore fishermen in Ayeyarwady Region.
  - To evaluate the post-harvest fish loss and post-harvest handling practices which affect the income status of inshore fishermen in Ayeyarwady Region.
  - To identify the main challenges and the way to overcome to reduce post- harvest fish loss in in Ayeyarwady Region.

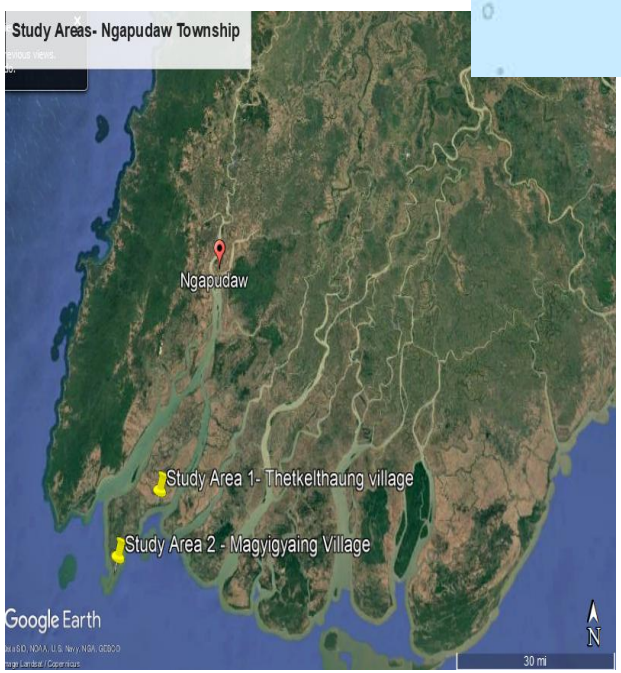
Profile of the Study Area

- Ayeyarwady has 26 townships with various levels of marine production. Pyapon township ranks the highest, producing 174,049 Viss of marine fish. Ngapudaw follows second largest share of fish production, with 117,960 Viss of marine fish and prawn.

- The study was conducted in two villages tract in Ngapudaw Township, which is mainly operating inshore fishing of the Ayeyarwady region. Ngapudaw Township is situated in the southernmost part of Myanmar, bordering the Bay of Bengal.

- Most of the people in these regions rely on fishing for their livelihood, resulting in the second largest fishing population in the township.

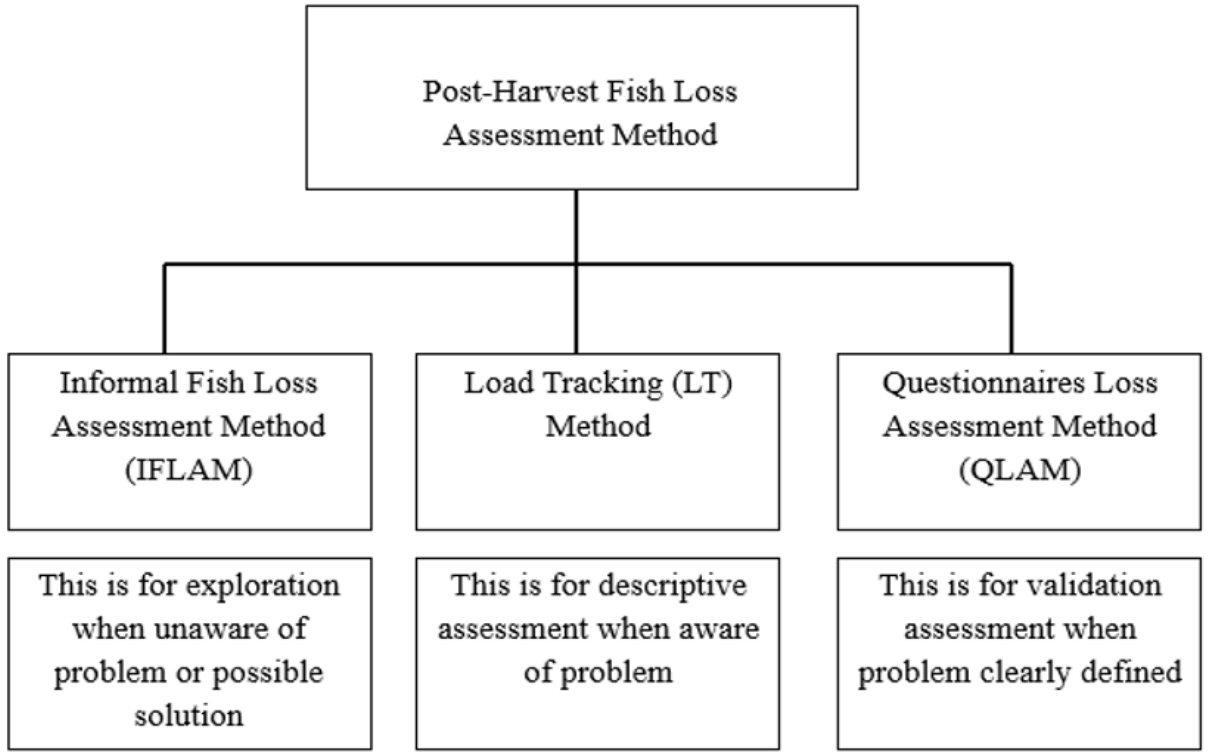
- Ngapudaw township has 83 village tracts and 411 villages including the studied areas, Thetkelthaung village and Dee Du Kone village.



Methodology

- Study conducted in Thetkelthaung and Dee Du Kone villages
- Used mixed-method: FAO's the Informal Fish Loss Assessment Method (IFLAM), and Questionnaire Loss Assessment Method (QLAM) (Diei-Ouadi & Mgawe, 2011).
- Primary data were collected to 120 surveyed fishers + 30 key informant interviews during May 2025. These respondents were randomly selected from the total 185 fisher population by using simple size determination formula.
- Data analyzed using Excel.

Fish Loss Assessment Methods.



Sources: (Diei-Ouadi & Mgawe, 2011)

Key Findings

Demographics Information

- ❑ 100% depend on fishing
- ❑ 73% with >10 years of experience
- ❑ 80% with primary/middle education
- ❑ 60% use external labor

Table (4.1) Profile of the Respondents **(N=120)**

Variables (n=120)	Classification	Frequency	Percentage
Age Group	31 - 40	17	14.2%
	41 - 50	69	57.5%
	51 - 60	31	25.8%
	Above 60	3	2.5%
Education Level	High School	17	14.2%
	Higher Education	6	5.0%
	Middle School	53	44.2%
	Primary School	44	36.6%
Years in Fishing	>10 years	88	73.3%
	7–9 years	32	26.7%
Main Income from Fishing	Yes	120	100%
Who is Involved in Fishing	HH member only	48	40.0%
	Labor only	35	29.2%
	HH member and Labor	37	30.8%

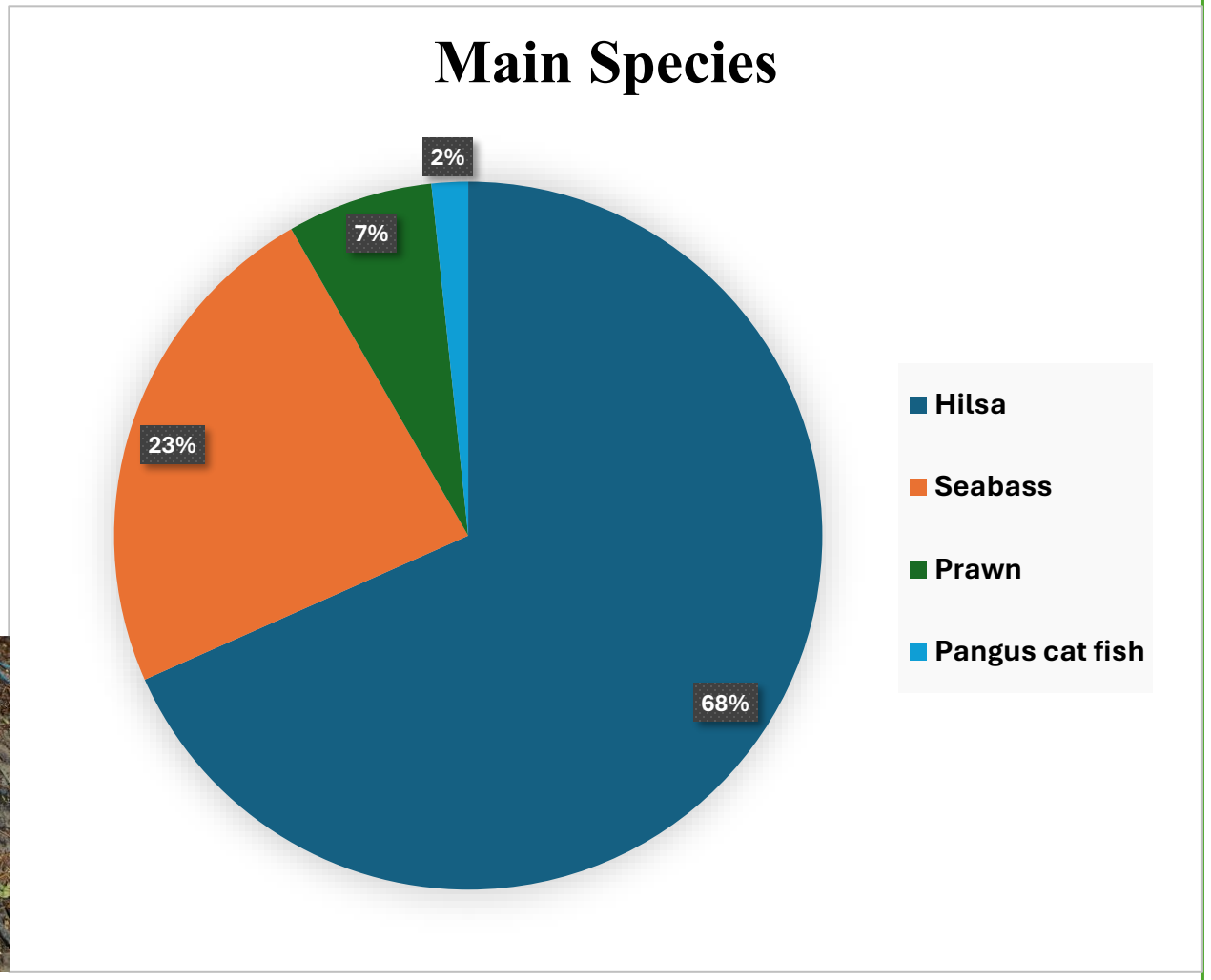
Source, Survey data 2025

Fishing method, Fish species and Fish Price

Fishing Method	Species Name		Species Size (local unit)	Market Price (MMK) per Viss
	English Name	Myanmar Name		
Drift Gill Net	Hilsa	Nga Tha Lauk	10x12 inches	50000 ~ 48000
			8x10 inches	47000 ~ 45000
Bottom Gill Net	Seabass	Ka Ka Tit	5 Viss	40000
			3 Viss	35000
Trawl	Prawn	Pa Zun (Tiger)		20000 ~ 50000
Dirft Gill Net	Pomfret	Nga Mote Phyu	15 tickles	50000
Bottom Gill Net	Indian threadfin	Ka Ku Yan		15000
Bottom Gill Net	Black Spotted croaker	Ka Tha Myin	3 Viss	35000
Long Line	Pangas catfish	Nga Dan		15000
Dirft Gill Net	Spotted Catfish	Nga Yaung Phyu		5000 ~ 6000
Dirft Gill Net	Pama croaker	Nga Buu Sae		4000

Main species in the study area

- 68 % of the total catch is Hilsa
- Seabass makes around 23 %
- Prawn make up 7% of total catch
- Pangus catfish with only 2%



Current Post-Harvest Handling Practices

The total of 15 questions were asked by using Five Likert Scales method (Never-1, Rarely -2, Occasionally -3 , Frequently-4 and Always- 5)

Mean Value

- ❑ High: Weather checks (4.93)
- ❑ High: Sorting by size (4.55)
- ❑ Moderate: Bring sufficient ice (4.38)
- ❑ Moderate: Store fresh catch in clean containers (3.74)
- ❑ Low: Regular clean container and boat (3.42)
- ❑ Low :sun protection (3.20)
- ❑ Low: Use of sanitized tools (3.12)

Overall Mean score: 4.02

Sr. No	Description	Mean	Std. Deviation
1	I check weather forecasts before fishing trips.	4.93	0.26
2	I handle fish gently during harvest to prevent damage.	3.83	0.69
3	I store fresh catch in clean containers on the boat.	3.74	0.76
4	I chill fish immediately after harvest on the boat.	3.45	0.53
5	I protect fish from sunlight using shaded storage.	3.20	0.90
6	I keep the boat hygienic to avoid fish contamination.	3.89	0.73
7	I regularly clean the storage boxes and hold areas after every fishing trip.	3.42	0.66
8	I separate fish from non-edible or waste items during transportation.	4.15	0.76
9	I transport fish in protective containers.	4.12	0.87
10	I bring sufficient ice to preserve fish freshness.	4.38	0.88
11	I transport fish to the shore within 3 hours of catch.	3.51	0.89
12	I sort fish according to size and species as soon as they are landed.	4.55	0.58
13	I use clean and sanitized tools (like knives, baskets, places) before sorting.	3.12	0.39
14	I monitor and replace ice as needed.	3.93	0.86
15	I display fish hygienically at the market.	4.68	0.57
	Overall Mean Value	**4.02**	

Current Post-Harvest Fish Loss

- ❑ **54%** report physical loss
- ❑ **54 %** Frequently loss
- ❑ lose **~10%** per trip
- ❑ **92%** experience reduced prices
- ❑ Mostly Loss occur in during hauling **(71%)**
- ❑ High loss season : **Sept ~ Dec**

Variable (n-120)	No.(%)	**Variable** (n-120)	No.(%)
What types of fish loss are experienced mostly?		**When do you mostly incur losses?**	
Physical Loss	65 (54)	During storage on board	9 (8)
Quality loss	55 (46)	During transportation to market	26 (22)
How often does the loss occur?		Handling during hauling	85 (71)
Always	10 (8)	**Please indicate approximately what proportion of your caught fish spoil/damage last time?**	
Frequently	65 (54)	<5 %	36 (30)
Occasionlly	43(36)	5%	24 (20)
Rarely	2 (2)	10%	26 (22)
How much fish do you usually lose in every fishing?		20%	6 (5)
< 5%	14 (12)	30%	28 (23)
5%	16 (13)	**Which season do you get high losses?**	
10%	49 (41)	Jan - April	28 (23)
20%	11(9)	May - August	0 (0)
30%	30 (25)	Sept - Dec	92 (77)
Do you get lower price due to the low quality of fish?			
No	10 (8)		
Yes	110 (92)		

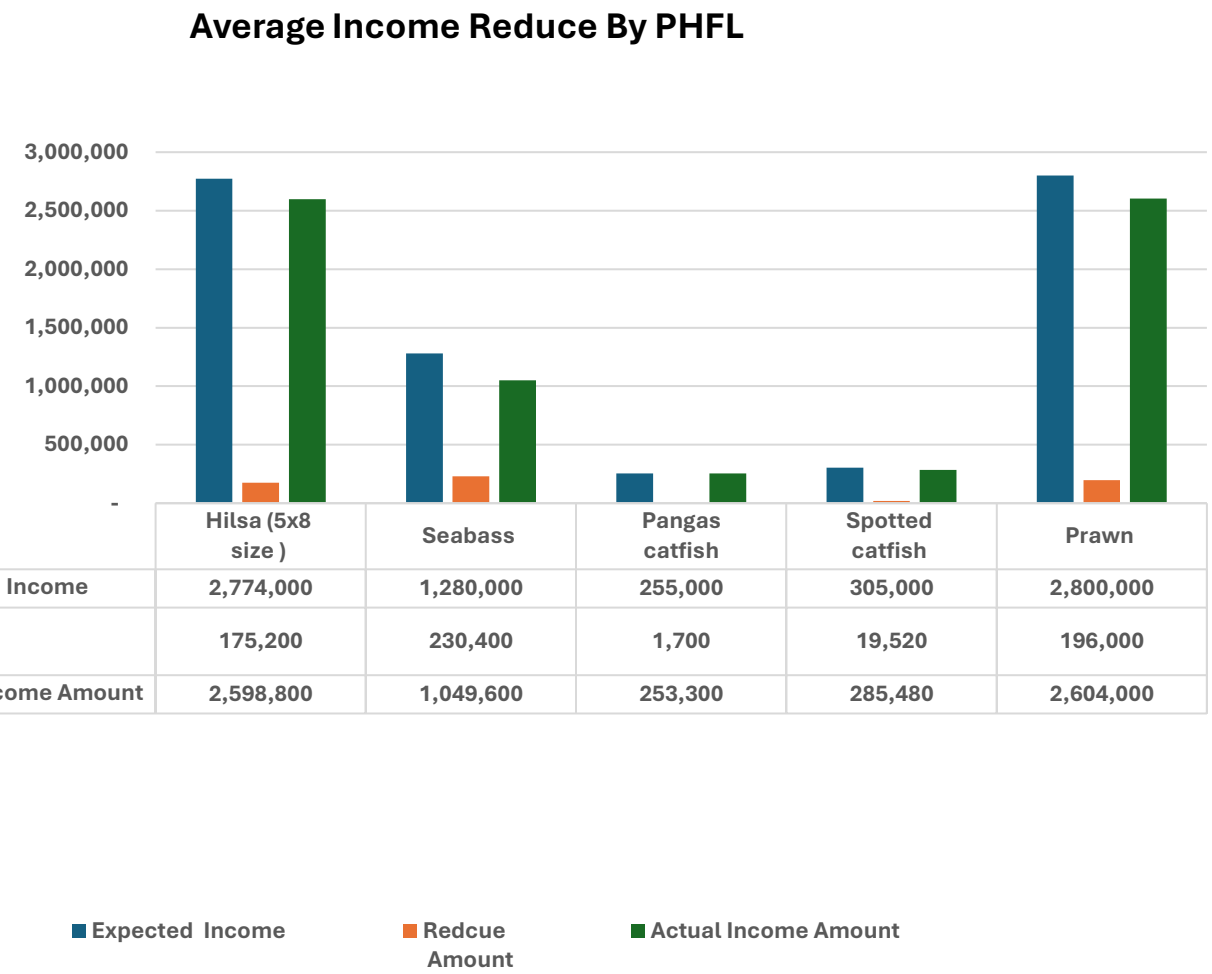
Income Reduced by Fish Loss

Species	Expected Income by Fresh Fish			Actual income due to damage fish				Percentage of income reduced
	Average Total Volume of Catch (Viss)	Market Price of fish (per Viss)	Total expected income (MMK)	Average Total Volume of damage fish (Viss)	Current price of damage fish (per Viss)	Reduced Amount	Actual Income (expected income – reduced amount)	
Hilsa (5x8 size)	73	38,000	2,774,000	11.68	23,000	175,200	2,598,800	6 % reduced
Seabass	32	40,000	1,280,000	7.68	10,000	230,400	1,049,600	18 % reduced
Pangas catfish	17	15,000	255,000	0.85	13,000	1,700	253,300	0.67 % reduced
Spotted Catfish	61	5,000	305,000	9.76	3,000	19,520	285,480	6 % reduced
Prawn	70	40,000	2,800,000	9.80	20,000	196,000	2,604,000	7 % reduced

Source, Survey data 2025

Income Reduced by Species

- ❑ Hilsa: 6% income loss
- ❑ Seabass: 18 % loss
- ❑ Pangas catfish 0.67 % loss
- ❑ Spotted Catfish 6%
- ❑ Prawns: 7% loss



	Hilsa (5x8 size)	Seabass	Pangas catfish	Spotted catfish	Prawn
Expected Income	2,774,000	1,280,000	255,000	305,000	2,800,000
Redcue Amount	175,200	230,400	1,700	19,520	196,000
Actual Income Amount	2,598,800	1,049,600	253,300	285,480	2,604,000

Main Causes of Loss

Main Causes of Loss by fisher experiences

Cause of Fish Loss	Mean	Rating Level	Notes
Fish stress or physical harm during capture	4.58	🔴 **High**	Most critical factor affecting fish loss
Predation by aquatic animals	4.50	🔴 **High**	Major contributor to fish loss post- harvest
Transport delays	3.93	🟠 **Medium**	A common cause due to poor logistics
Delayed chilling	3.73	🟠 **Medium**	Contributes significantly to spoilage
Inadequate ice supply	3.71	🟠 **Medium**	Reflects cold chain problems
Lack of regular inspections	3.46	🟠 **Medium**	Leads to unnoticed spoilage
Less demand reduces price	2.65	🟢 **Low**	Due to border trade

Findings - KII

Key Informant Profile

- ❑ 30 male fishers interviewed; all aged 41+
- ❑ 90% had only primary/middle school education
- ❑ 100% rely solely on fishing; over 10 years' experience

Types of PHFL Experienced

- ❑ **60%** reported **quality loss** (mainly due to lack of ice)
- ❑ **37%** faced **physical loss** (damage, predator attacks)
- ❑ Only **1** experienced all three types of loss

Main Causes of Loss

- ❑ **Long net holding** causes fish injury
- ❑ **Delayed chilling** leads to spoilage
- ❑ **Ice shortages** especially during peak seasons
- ❑ **Predator attacks** (e.g., puffer fish, crabs) from Sept–Dec
- ❑ **Long transport times** increase spoilage

Physical loss

Physical /Quality loss

Findings -KII

High Loss Periods

- ❑ **Sept–Dec**: predator attacks
- ❑ **May–July**: spoilage due to weather, long net times

Effects of Loss

- ❑ **Reduced income**, can't repay loans
- ❑ Collectors **downgrade quality**, offer lower prices
- ❑ **Debt cycle** continues into next season

Main Challenges

- ❑ **Lack of ice supply** and local ice factories
- ❑ Small fishers skip ice due to **cost & profit uncertainty**
- ❑ **Limited storage** on boats
- ❑ Borrowing from collectors leads to **price control**

Findings-KII

Coping Strategies

- ❑ **Ice sharing** among fishers
- ❑ Use of **salt-ice** to preserve fish
- ❑ Crew trained for **gentle handling**
- ❑ **Fast sales** near shore to avoid spoilage

Support from Government/NGOs

- ❑ **No regular support** received
- ❑ Some one-time loans from PACT
- ❑ Demand for **low-interest loans** like farmers get

Recommendations

- ❑ Improve gentle handling and use appropriate fishing method at harvest.
- ❑ Build ice factory at key landing sites by collaboration with fishing community and ice traders.
- ❑ Promote insulated containers instead of using fiber boxes.
- ❑ Encourage collective marketing to negotiate fair price.
- ❑ Integrate training provided by DoF while renewal licensing
- ❑ Improve road access for faster market delivery.
- ❑ Provide low interest loans by authorities /NGOs.

Thetkelthaung village to Pathein road


THANK
YOU!
Q&A