

A Rapid Assessment of Fish and Fisheries Information in A Part of East Coast of Gulf of Mottama (Mon State)

Tint Wai, Win Ko Ko, Moe Moe Myint, Zaw Linn Htun, Thaw Phyo Shwe, Tint Tun

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INTRODUCTION

Gulf of Mottama (Martaben) is situated almost in the middle of the Myanmar coast. It is surrounded by the land in east, north and west and, the Andaman sea in the south. It is a shared-water body of the Yangon Region, Bago Region and Mon State of Myanmar.

Two prominent rivers, Sittoung and Thanlwin, flow into the Gulf of Mottama. Thanlwin river is a very long river with 2815km in length. It starts from the Tibetan Plateau, flows through China, Thailand and Myanmar before it opens into the Gulf of Mottama. Near the mouth the river has an average annual discharge of $1659\text{m}^3/\text{s}$ although this varies widely.

Tides ranges between 4-7m with the highest tidal range of 6.5m at the Kyaikkami in the eastern and 7m at the Elephant Point in the western Gulf of Mottama.

During the spring tide, when the tidal range is around 6.6m, the turbid zone covers an area of more than $45,000\text{km}^2$ making it as one of the largest perennially turbid zones of the world's oceans. During the neap tide, with tidal range of 2.98m, the highly turbid zone coverage drops to $15,000\text{km}^2$.

Gulf of Mottama coastal area has very broad mud flats, sandy beaches and salt marshes. It is a very good fish spawning ground. Some migratory birds inhabit in the Gulf of Mottama area during their winter migratory flight from the north.

A rapid assessment of fish and fisheries in part of the east coast of the Gulf of Mottama was done during 31 March to 24 April 2014 and results have been described in this paper.

METHOD

Interview survey was conducted at the villages. Fish samples were collected from fish markets and fishing grounds. Fishing gears were observed at villages and at the fishing grounds.

OBJECTIVES

- To study the fish, fishing gears and situation of fishing community of the area.
- To provide fisheries information to the Gulf of Mottama RAMSAR Site proposal.

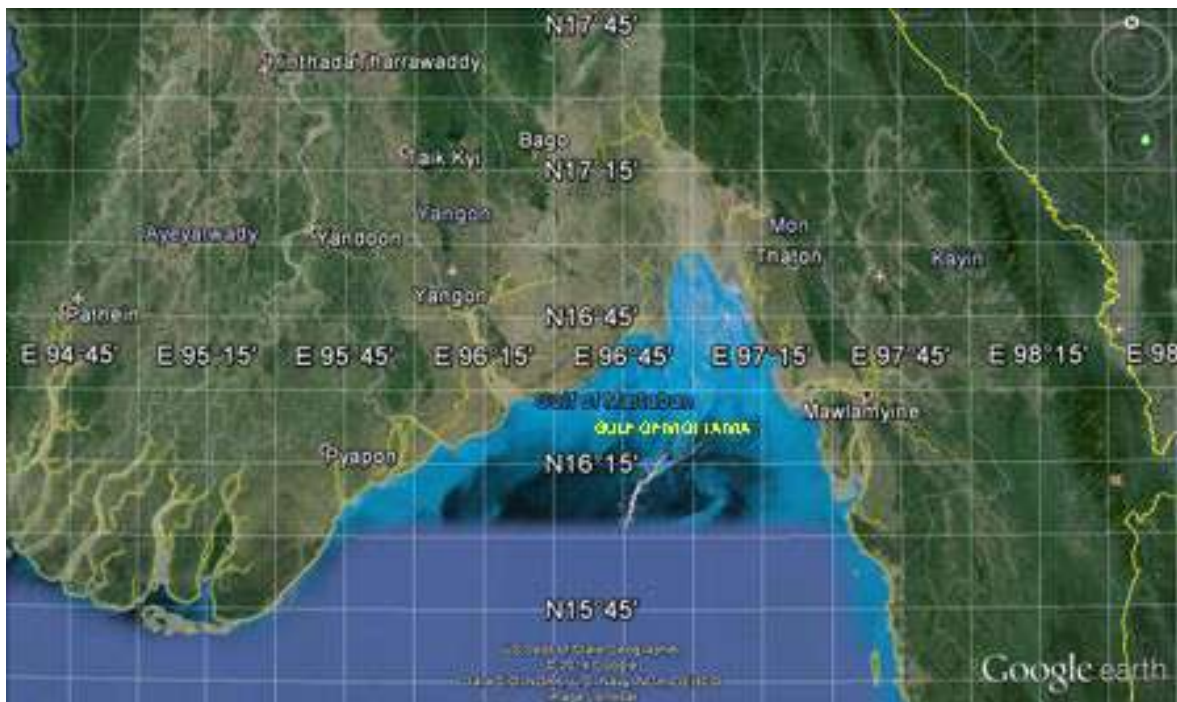


Figure 1. Gulf of Mottama.



Figure 2. The team in the field near the Koe te su village in Kyaihto fishing ground.

TINERARY

Two trips were made to the east coast of the Gulf of Mottama during March to April 2014. The survey team went to Khin tan, Wee pa dan, Ahlat villages in Paung Township, Aung kan tha village in Thaton Township, Ywar tan she and Zot ka li villages in Belin Township and,

Thein ngu, Koe te su and Kyar si aung villages in Kyaikto Township of Mon State. As they are situated near the shore or tidal area, boats and tri-wheel cycle taxi which is locally known as “Sampalaw” are the main transportation vehicles to go around the area.

Table 1. The first trip to the east coast of the Gulf of Mottama (31 Mar – 5 Apr 2014).

Date	From	To	Vehicle	Activities
31 Mar 2014	Yangon	Paung town	Car	Transit
	Paung town	Khin tan and Wee pa dan villages	Tri –wheel motorcycle taxi (Sampalaw)	Collect information at fish market. Overnight stop at Khin tan village.
1 April 2014	Khin tan village	Khin tan village	boat	Visit coastal fishing area. Collect fish sample and fishery information. Overnight stop at Khin tan village.
2 April 2014	Khin tan village	Aung kan tha village	Sampalaw and boat	Collect fishery information. Interview with fishermen and village authority. Overnight stop at Aung kan tha village.
3 April 2014	Aung kan tha village	Aung kan tha village	Boat	Visit coastal fishing area. Collect fish and fishery information. Overnight stop at Aung kan tha village.
4 April 2014	Aung kan tha village	Ywar tan she village	Boat and Sampalaw	Collect fishery information. Interview fishermen and village authority. Overnight stop at Ywar tan she village.
5 April 2014	Ywar tan she village	Belin town	Boat	Transit
	Belin town	Yangon	Car	

Table 2. The second trip to the east coast of the Gulf of Motamma (19 Apr – 24 Apr 2014).

Date	From	To	Vehicle	Activities
19 Apr 2014	Yangon	Kyaikto town	Car	Visit township fisheries office.
	Kyaikto town	Thein ngu village.	Car	Transit
	Thein ngu village	Koe te su village	Boat	Overnight stop near Koe te su village.
20 Apr 2014	Koe te su village	Kyeikto fishing ground	Boat	Collect fish sample and fishery information in Kyaikto fishing area. Interview with fishermen.
	Kyaikto fishing ground	Thein ngu village	Boat	Overnight stop at Thein ngu village.
21 Apr 2014	Thein ngu village	Koe te su and Kyar si aung village	Sampalaw	Collect fishery information. Interview with fishermen and village aurohotiry.
	Kyar si aung	Koe te su and Thein ngu villages	Sampalaw	Overnight stop at Thein ngu village.
22 Apr 2014	Thein ngu village	Zot ka li village	Sampalaw	Collect fish sample and fishery information. Overnight stop at Zot ka li village.
23 Apr 2014	Zot ka li village	Zot ka li village	Boat	Collect fish sample and fishery information in Zot ka li fishing area. Overnight stop at Zot ka li village.
24 Apr 2014	Zot ka li village	Belin town	Sampalaw	Transit
	Belin town	Yangon	Car	

Table 3. Location of data collection sites.

Station	Sampling Site	Location	
		Latitude (N)	Longitude (E)
01	We pa dan fishing landing site	16° 30' 38.32"	97° 21' 59.64"
02	Khin tan fish landing	16° 30' 55.9"	97° 21' 29.4"
03	Khin tan fish market	16° 30' 26.1"	97° 21' 55.1"
04	Set bag net fishing site	16° 30' 44.6"	97° 21' 16.7"
05	Aung kan tha village landing site	16° 52' 25.6"	97° 14' 15.1"
06	Ywar tan she village landing site	17° 08' 50.6"	97° 05' 48.6"
07	Thein ngu village landing site	17° 16' 58.6"	97° 02' 30.3"
08	Set bag net fishing site	17° 10' 11.5"	96° 57' 57.5"
09	Set gill net fishing site	17° 09' 42.4"	96° 59' 05.7"
10	Koe te su village landing site	17° 12' 35.9"	97° 00' 44.5"
11	Koe te su village landing site	17° 12' 35.8"	97° 00' 27.5"
12	Kyar si aung village landing site	17° 12' 18.8"	97° 01' 02.03"
13	Zot ka li fishing site	17° 07' 22.1"	97° 08' 43.1"
14	Zot ka li fish landing site	17° 07' 19.7"	97° 08' 17.0"
15	Zot ka li village	17° 07' 19.8"	97° 08' 17.1"



Figure 3. Map showing the Thein ngu, Koe te su and Kyar si aung villages.

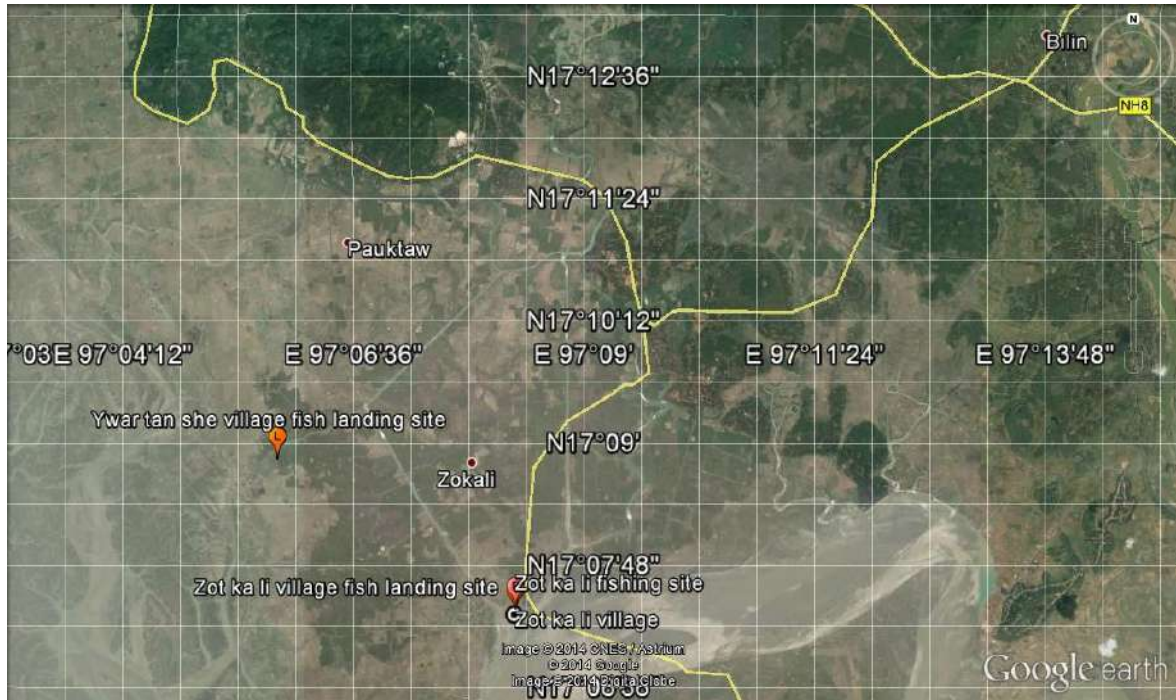


Figure 4. Map showing the Ywar tan she and Zot ka li villages.

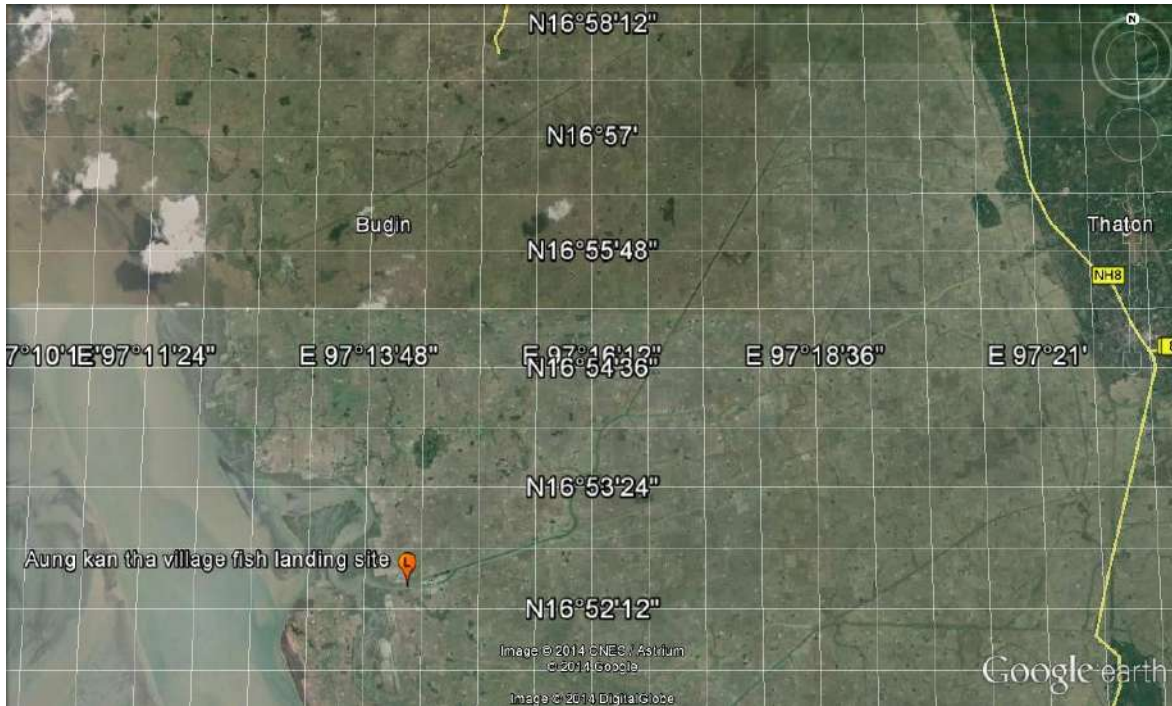


Figure 5. Map showing the Aung kan tha village.

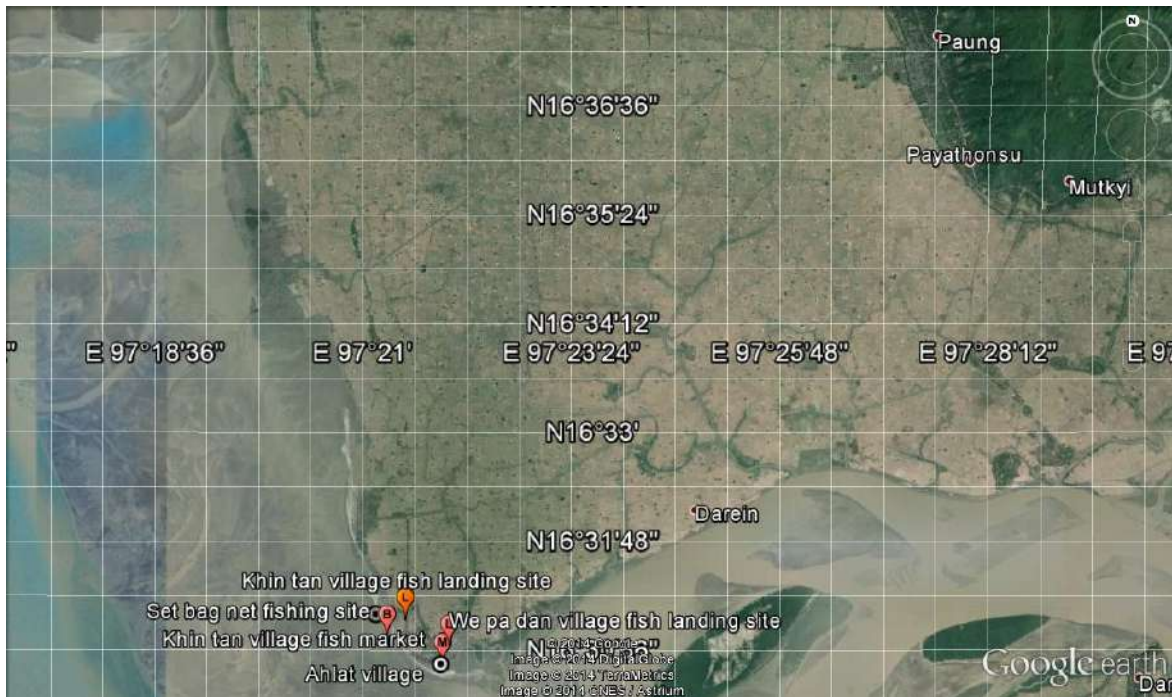


Figure 6. Map showing the Ahlat, Khin tan and Wee pa dan villages.

FISHER FAMILIES

FAMILY

A total of 11 fishers were interviewed about their livelihood during the survey. They are one from Wee pa dan, two from Khin tan village, one from Aung kan thar village, one from Ywa tan she village, one from Thein ngu villag, three from Zot ka li village, one from Kyar si aung and one from Koe te su village. All interviewee were Buddhist and, they are Myanmar, Mon and Kayin ethnics.

They are head of their families. Among them, the oldest was 56 years old and the youngest was 34 years old. The biggest family has nine members and smallest has only two.

It was observed that, as an overall, fisher family of the survey area is female-dominant as 55.1% is female and the remaining 44.9% is male. The maximum no. of male and female in a family are found to be four and five respectively.

EDUCATION

According to the survey, education level of the head men is low as 22% of the respondents are illiterate and the remaining 78% learned just up to primary level.

PROPERTY

Though they are fishers, they own their house and boats. Their houses are made by bamboo and wood. Forty four per cent of the interviewee own bamboo house whereas the remaining 56 per cent own wooden house.

BUSINESS

Fishing is their main business using different fishing gears but they all are small scale fishermen. All own motorized fishing boats. Investment for a fishing boat (boat and nets) ranges from 100,000 to 1,900,000 kyats.

INCOME

Families can earn 40,000 to 700,000 kyats per month from fishery and 1,000 to 200,000 kyats from other extra work. Daily income from fishing is 3,000 to 15,000 kyats. Family expense ranges from 5,000 to 300,000 kyats per month.

However, 67% of the respondent told that their income from fishing is not enough

for their families. Therefore, apart from the fishing, 56% of the respondent fishers also have other jobs.

Running a store or work as daily wages labour or horticulture plantation or duck poultry are the other jobs working by the respondents.

Women earn extra income by working at seasonal paddy plantation, ground nut

plantation, shells and crabs collection during the low water. Just a few fisher folks also do duck poultry.

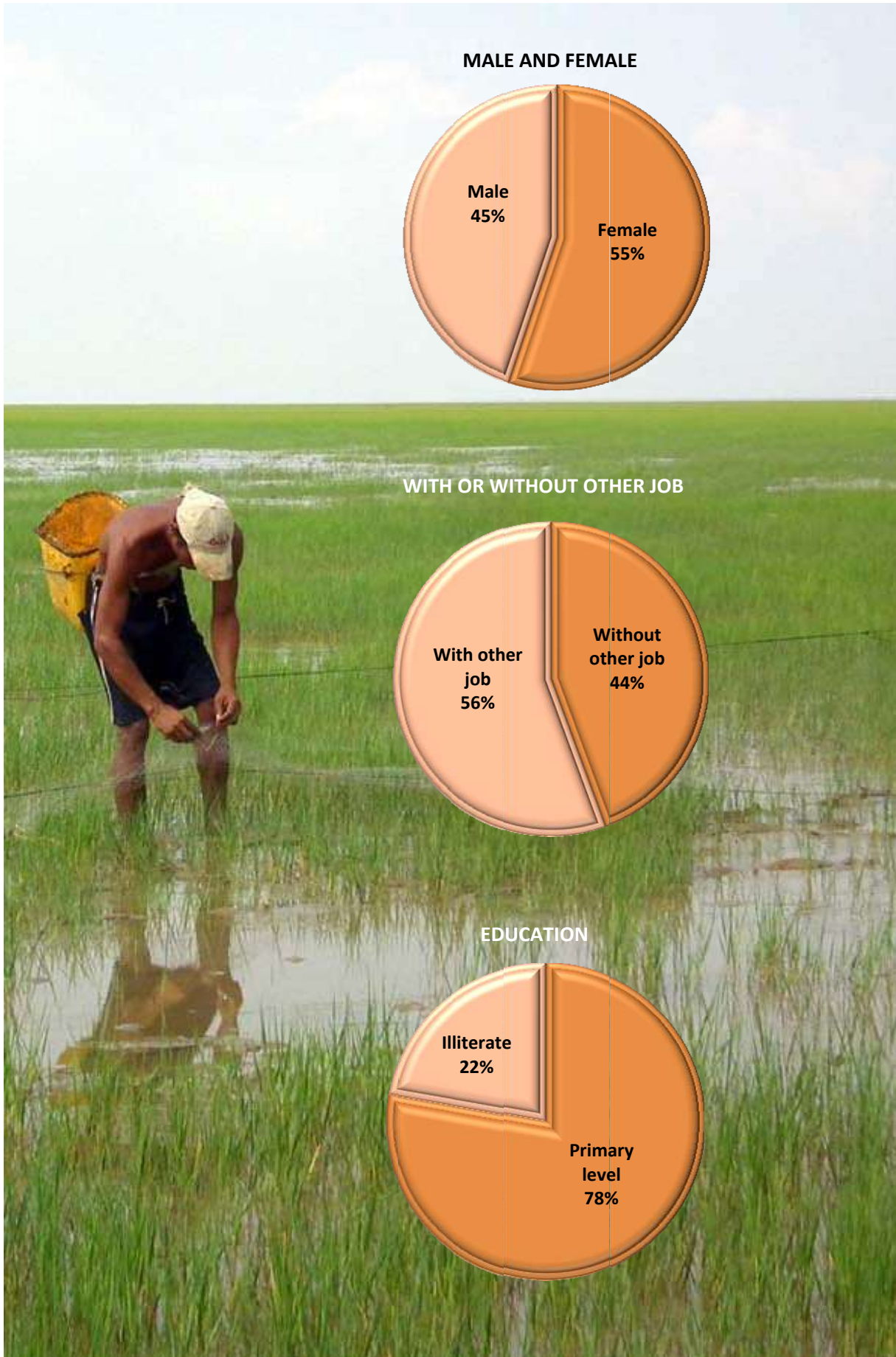
It is learned that some children of fisher families have been working in Thailand and they send back some money to their parents.



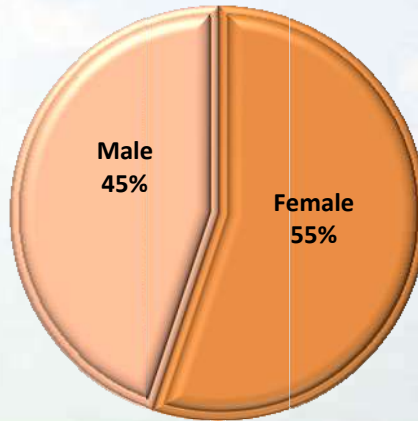
Figure 7. A catch by a set gill net at Koe te su fishing area.



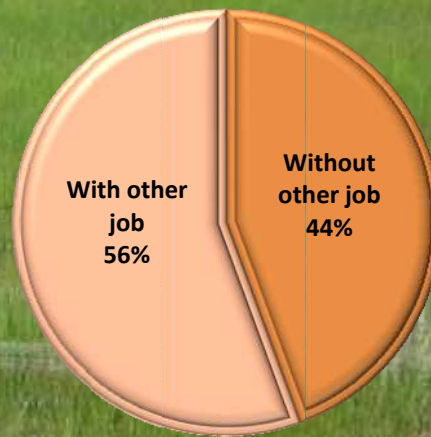
Figure 8. Fishing boats are waiting for tide at Their ngu village landing site.



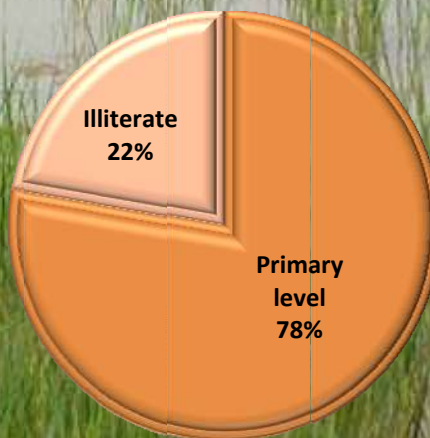
MALE AND FEMALE



WITH OR WITHOUT OTHER JOB



EDUCATION



FISH

A total 39 fish species belong to 35 Genera and 26 Families were observed during the survey.

Table 9. List of fishes observed during the survey.

Sr.	Family	Scientific Name	Local Name
1	ARIIDAE	<i>Nemapteryx caelata</i> (Valenciennes, 1840)	Nga yaung
2	BELONIDAE	<i>Strongylura strongylura</i> (Van Hasselt, 1823)	Nga phaung yoe
3	CARANGIDAE	<i>Megalaspis cordyla</i> (Linnaeus, 1758)	Pyi daw tha
4	CARCHARHINIDAE	<i>Scoliodon laticaudus</i> Muller & Henle, 1838	The nga mann
5	CENTROPOMIDAE	<i>Lates calcarifer</i> (Bloch, 1790)	Ka ka dit
6	CHIROCENTRIDAE	<i>Chirocentrus dorab</i> (Fosskal, 1775)	Nga da lwe
7	CLUPEIDAE	<i>Anodontostoma chacunda</i> (Hamilton, 1822)	Nga wun pu
8		<i>Ilisha novacula</i> (Valenciennes, 1847)	Nga zin byar
9		<i>Tenualosa ilisha</i> (Hamilton, 1822)	Nga tha lauk
10		<i>Tenualosa toli</i> (Valenciennes, 1847)	Nga par mee
11	CYNOGLOSSIDAE	<i>Cynoglossus cynoglossus</i> (Hamilton, 1822)	Khwe sha lay
12	DREPANIDAE	<i>Drepane punctata</i> (Linnaeus, 1758)	Nga pa le
13	ELOPIDAE	<i>Megalops cyprinoides</i> (Broussonet, 1782)	Ka law lae
14	ENGRAULIDAE	<i>Setipinna wheeleri</i> Wongratana, 1983	Nga byar
15		<i>Coilia dussumieri</i> Valenciennes, 1848	Mee tan thwe
16		<i>Thryssa mystax</i> (Bloch & Schneider, 1801)	Nga par shar
17	GOBIIDAE	<i>Odontamblyopus rubicundus</i> (Hamilton, 1822)	Nga byet ni
18		<i>Pseudapocryptes elongatus</i> (Cuvier, 1816)	Nga byet
19	HEMIRAMPHIDAE	<i>Hyporhamphus limbatus</i> (Valenciennes, 1847)	Nga phaung yoe gaung toe
20	HERPODONTIDAE	<i>Harpadon nehereus</i> (Hamilton, 1822)	Nga hnatt
21	LEIognATHIDAE	<i>Leiognathus equulus</i> (Fosskal, 1775)	Nga wine
22	LOBOTIDAE	<i>Lobotes surinamensis</i> (Bloch, 1790)	Pin le nga byay ma
23	MUGILIDAE	<i>Chelon parsia</i> (Hamilton, 1822)	Ka ba loo
24		<i>Sicamugil hamiltonii</i> (Day, 1870)	Ka ba loo
25		<i>Rhinomugil corsula</i> (Hamilton, 1822)	Nga zin lone
26	PANGASIDAE	<i>Pangasius pangasius</i> (Hamilton, 1822)	Nga dan
27	PLATYCEPHALIDAE	<i>Platycephalus indicus</i> (Linnaeus, 1758)	Nga sin ninn
28	PLOTOSODAE	<i>Plotosus lineatus</i> (Thunberg, 1787)	Pin le nga khu
29	POLYNEMIDAE	<i>Eleutheronema tetradactylum</i> (Shaw, 1804)	Za yaw gyi, Mee na kwa
30		<i>Leptomelanosoma indicum</i> (Shaw, 1804)	Ka ku yan
31		<i>Polynemus paradiseus</i> Linnaeus, 1758	Nga pon nar
32		<i>Polydactylus sextarius</i> (Bloch & Schneider, 1801)	Zayaw
33	SCIAENIDAE	<i>Otolithoides biauritus</i> (Cantor, 1849)	Nat ga daw
34		<i>Otolithoides pama</i> (Hamilton, 1822)	Nga poke thin
35		<i>Protonibea diacanthus</i> (Lacepede, 1802)	Kat tha hmyin
36	SILLAGINIDAE	<i>Sillago sihama</i> (Fosskal, 1775)	Nga pa lway
37	TERAPONTIDAE	<i>Terapon jarbua</i> (Fosskal, 1775)	Gon kyar
38	TETRAODONTIDAE	<i>Chonerhinus naritus</i> (Richardson, 1848)	Nga pu tin
39	TRICHUIDAE	<i>Lepturacanthus savala</i> (Cuvier, 1829)	Nga da gun

Table 10. The IUCN status of the fishes observed in a part of the east coast of the Gulf of Mottama during the rapid assessment.

Sr	Scientific Name	Common Name	Local Name	IUCN 2013.2
1	<i>Anodontostoma chacunda</i> (Hamilton, 1822)	Chacunda gizzard shad	Nga wun pu	Not Evaluated
2	<i>Chelon parsia</i> (Hamilton, 1822)	Gold sport mullet	Ka ba loo	Not Evaluated
3	<i>Chirocentrus dorab</i> (Fosskal, 1775)	Dorab wolf herring	Nga da lwe	Not Evaluated
4	<i>Coilia dussumieri</i> Valenciennes, 1848	Gold spotted grenadier anchovy	Mee tan thwe	Not Evaluated
5	<i>Cynoglossus cynoglossus</i> (Hamilton, 1822)	Long tongue sole	Khwe sha lay	Not Evaluated
6	<i>Drepane punctata</i> (Linnaeus, 1758)	Spotted sickle fish	Nga pa le	Not Evaluated
7	<i>Eleutheronema tetradactylum</i> (Shaw, 1804)	Four finger threadfin	Za yaw gyi	Not Evaluated
8	<i>Harpadon nehereus</i> (Hamilton, 1822)	Bombay duck	Nga hnat	Not Evaluated
9	<i>Hyporhamphus limbatus</i> (Valenciennes, 1847)	Congaturi halfbeak	Nga phaung yoe gaung toe	Least Concern
10	<i>Ilisha novacula</i> (Valenciennes, 1847)	Burmese river ilisha	Nga zin byar	Least Concern
11	<i>Lates calcarifer</i> (Bloch, 1790)	Giant sea perch	Ka ka dit	Not Evaluated
12	<i>Leiognathus equulus</i> (Fosskal, 1775)	Common pony fish	Nga wine/Nga dinga	Least Concern
13	<i>Lepturacanthus savala</i> (Cuvier, 1829)	savalai hairtail	Nga ta gun	Not Evaluated
14	<i>Lobotes surinamensis</i> (Bloch, 1790)	Triple tail	Pin le nga byay ma	Not Evaluated
15	<i>Megalaspis cordyla</i> (Linnaeus, 1758)	Torpedo/Hard tail scad	Pyi daw tha / Dar ma naing	Not Evaluated
16	<i>Megalops cyprinoides</i> (Broussonet, 1782)	Indo pacific tarpon	Ka law lae	DD
17	<i>Nemapteryx caelata</i> (Valenciennes, 1840)	Engraved cat fish	Nga yang	Not Evaluated
18	<i>Odontamblyopus rubicundus</i> (Hamilton, 1822)	Goby	Nga byet ni	Not Evaluated
19	<i>Otolithoides biauritus</i> (Cantor, 1849)	Bronze croaker	Nat ga daw	Not Evaluated
20	<i>Otolithoides pama</i> (Hamilton, 1822)	Pama croaker	Nga poke thin	Not Evaluated

(Table 10 cont.)

Sr	Scientific Name	Common Name	Local Name	IUCN 2013.2
21	<i>Pangasius pangasius</i> (Hamilton, 1822)	Butter fish	Nga dan	Least Concern
22	<i>Platycephalus indicus</i> (Linnaeus, 1758)	Bartail flathead	Nga Sin Nin	Data Deficient
23	<i>Plotosus lineatus</i> (Thunberg, 1787)	Cat fish eel	Pin le nga khu	Not Evaluated
24	<i>Leptomelanosoma indicum</i> (Shaw, 1804)	Indian threadfin	Ka ku yan	Not Evaluated
25	<i>Polynemus paradiseus</i> Linnaeus, 1758	Paradise threadfin /Mango fish	Nga pon nar	Not Evaluated
26	<i>Polydactylus sextarius</i> (Bloch & Schneider, 1801)	Black spot threadfin	Zayaw	Not Evaluated
27	<i>Protonibea diacanthus</i> (Lacepede, 1802)	Spotted croaker	Kat tha hmyin	Not Evaluated
28	<i>Rhinomugil corsula</i> (Hamilton, 1822)	Fresh water mullet	Nga zin lone	Least Concern
29	<i>Scoliodon laticaudus</i> Muller & Henle, 1838	Spadenose shark	Loon nga man / the nga mann	Near Threaten
30	<i>Setipinna wheeleri</i> Wongratana, 1983	Burma hairfin anchovy	Nga byar	Not Evaluated
31	<i>Sillago sihama</i> (Forsskal, 1775)	Silver whiting/sillago	Nga pa lway	Not Evaluated
32	<i>Strongylura strongylura</i> (Van Hasselt, 1823)	<i>Spottail needle fish</i>	Nga phaung yoe	Not Evaluated
33	<i>Tenualosa ilisha</i> (Hamilton, 1822)	Hilsa shad	Nga tha lauk	Not Evaluated
34	<i>Tenualosa toli</i> (Valenciennes, 1847)	Toli shad	Tha lauk yauk pha/Par mae	Not Evaluated
35	<i>Terapon jarbua</i> (Forsskal, 1775)	Jarbua terapon	Gon kyar	Least Concern
36	<i>Thryssa mystax</i> (Bloch & Schneider, 1801)	Moustached thryssa	Nga par shar	Least Concern
37	<i>Chonerhinos naritus</i> (Richardson, 1848)	Puffer fish	Nga pu tin	Not Evaluated
38	<i>Pseudapocryptes elongatus</i> (Cuvier, 1816)	Mud goby	Nga byet	Least Concern
39	<i>Sicamugil hamiltonii</i> (Day,1870)	Burmese mullet	Ka ba loo	Not Evaluated

Threatened species were not observed during the survey.

FISHERIES

FISHING

Fisheries is one of the main businesses at some coastal villages in the east coast of the Gulf of Mottama. It is near shore artisanal fishery and wooden motorized fishing boats have been used. Fishing is governed by tide and weather especially for small scale fishers. Most of the fishing activities suspended during the raining season because of the weather and the sea hydrographic condition.

The tide reaches to the Thein ngu village in Kyaikto Township only during the spring tide. The fishers can get just about one hour to leave the village while water is deep enough for their boat. They must wait the next tide at a place, usually Koe te su water, near the sea to reach their fishing ground.

Most of the fishermen in the area, go fishing on the 5th. – 6th. waxing or waning

days and come back to the village on the 14th.- 15th. waxing or waning days. Generally, they fish in their nearby waters at about 5 to 15km away from the shore and at the depth of about 5 to 12m depth.

Days at fishing grounds range 10 to 20 days in a month and their fishing effort is two to six times a day. Catch at an effort can be about 1.6kg as minimum and 24kg as maximum depending on the kind and no. of fishing gears. Fishes are kept in ice boxes and sell to the purchasing center at the village or make dried fish.

Fishery business of the Gulf of Mottama is mainly operated by men. Only a few stop fishing while they are doing paddy cultivation but they do fishery business in the remaining seasons.

FISHING GEARS

Various kinds of nets have been observed during the survey. Drift gill net, trammel net, set gill net and set bag net and beach seine nets were observed and recorded their measurements. Except for the beach seine, all the other four gears are passive

fishing gears. Fishing nets are made of monofilament nylon ropes and local made floats are used. Some fisher use illegal fishing net which is a set gill net with very small mesh size (6mm) and locally known as “Than za gar pike”. About 50 “Than za gar pike” (TZGP)

owners, most of them are in Kyaikto area, fish in Kyaikto and Thaton fishing grounds. There is a conflict between the TZGP and drift net fishers frequently. Local people assumes that

the fish population in the Gulf of Mottama area is highly threatened by the “Than za gar pike”.

Drift gill net (Hmyaw pike), Trammel net (Thone htat pike)

Mesh size :

19mm, 25mm, 32mm

They are used at three to five meter deep water. The nets are deployed at high tide and drifted about 30 minutes. The nets are deployed two to four times at a tide depending on the tide cycle. Fishing effort is two times a day. They are near shore fishing nets.

Mesh size :

62mm, 76mm

They are used at five to six meter deep water. The nets are deployed at high tide and drifted about 30 minutes to one hour. They are deployed two to four times at a tide depending on the tide cycle and length of the net. Fishing effort is two times a day.

Mesh size :

125mm, 152mm

They are used at seven to eight meter deep water and targets at big fishes. The nets are deployed, up to four times, at high tide and drifted about one hour. Fishing ground extends from the east coast of the Gulf of Mottama to the Yangon Lighthouse. Nowadays, fishers stop fishing with such kind of big mesh size nets due to the very poor catch and, consequently, lost their business.

Set gill net (Tar pike, Than za gar pike)

Mesh size of the net is just about six millimeter. Since the net is very small mesh size and stretch several miles along the coast, during the neap tide. Therefore, small fishes cannot get chances to escape from the net. As a consequence, population of some commercially important fishes such, Hilsa (Nga

tha lauk), Indian threat fin (Ka ku yan), Engraved catfish (Nga yang), Spotted croaker (Ka tha myin), Butter fish (Nga dan) etc. has been decreasing and, in future, they can be extinct in this eastern coast of Gulf of Mottama water.



Figure 9. "Than za kar pike".

Set bag net (Taing htaung kyar, Kyar pazat pike, Kyar pike)

Type 1 Set bag net (Taing htaung kyar).

Mouth of this kind of set bag net always open to the north direction. They are set at fixed supporting bamboo structure facing to the receding tide. This kind of bag net is set at the near shore structure during the spring tide but further out structure to the sea during the neap tide. They are mostly found in Paung Township. Only fingerlings and small shrimps are caught in the net.

Type 2 Set bag net (Kyar pa zat pike).

This kind of set bag net is usually set in the current and river mouths. Variety of fishes and small shrimps are main catch in the net. Not like the type 1 set bag nets, they are stationary set bag nets. Regardless of the tide, they are always set in the current. They are usually used in Belin and Thaton fishing grounds and mostly in the waters of Koe te su village.

Beach seine (Thaung swell pike)

Most of the fishermen from Ywa tan shay village use only boat based beach seine nets of 350 – 400m in length, 2.66m in height and 19-25mm in mesh size. Fishing can be done about three times in two hours and, therefore, about six times in a day. Fishing

effort is about five days at a tidal cycle. Four to five fishermen on a boat and they can enjoy half by half with the boat owner after the expenses are deducted. The price of a boat with nets is 1.2 – 1.5 million kyats. Catches are sold at the Zote ka li purchasing station.



Figure 10. Fishes at Ahlat village market.

TARGET FISHES

The most target species by the fishers in order are

1. *Polynemus sp.* (Ka ku yan, Nga pon nar)
2. *Otolithoides* (Nga pok thin, Nat ka daw)
3. *Lates sp.* (Ka ka dit)
4. *Arius sp.* (Nga yaung)
5. *Liza sp.* (Ka be loo)
6. *Sillago sp.* (Nga pa lway)
7. *Hilsa sp.* (Nga tha lauk)
8. *Protonibea sp.* (Ka tha hmyin)
9. *Lobotes sp.* (Pinle nga byay ma)
10. *Harpadon sp.* (Nga hnatt)
11. *Lepturacanthus sp.* (Nga da gon)
11. *Pangasius sp.* (Nga dan)
12. *Odontamblyopus sp.* (Nga byet ni)

MAJOR FISH SPECIES CAUGHT IN THE GEARS

The most caught fish species in the gears in order are

1. *Liza sp.* (Ka be loo)
2. *Polynemus sp.* (Ka ku yan, Nga pon nar)
3. *Lates sp.* (Ka ka dit)
4. *Otolithus* (Nat ka daw)
5. *Sillago sp.* (Nga pa lway)
6. *Arius sp.* (Nga yaung)
7. *Otolithoides sp.* (Nga poke thin)

THE MOST ABUNDANT SPECIES IN THE GULF OF MOTTAMA

According to the fisher folks, the most abundant fish species in the Gulf of Mottama are

1. *Liza sp.* (Ka be loo)
2. *Lates sp.* (Ka ka dit)
3. *Polynemus sp.* (Ka ku yan, Nga pon nar)
4. *Otolithoides sp.* (Nga poke thin)
5. *Eleutheronema tetradactylum* (Mee na kwa)
6. *Arius sp.* (Nga yaung)
7. *Sillago sp.* (Nga pa lway)

Table 4. Drift gill net observed, their specifications and target fishes at the villages.

Sr	Village	Net measurement				Target fish											Remarks		
		Length (m)	Height (m)	Mesh size (mm)	Cover Mesh size (mm)	<i>Hilsa</i> sp. (Nga tha lauk)	<i>Otolithoides</i> (Nga pok thn, Nat ka daw)	<i>Polynemus</i> sp. (Ka ku yan. Nga pon nar)	<i>Lates</i> sp. (Ka ka dit)	<i>Arius</i> sp. (Nga yaung)	<i>Liza</i> sp. (Ka be loo)	<i>Sillago</i> sp. (Nga pa lway)	<i>Protonibea</i> sp. (ka tha hmyin)	<i>Lobotes</i> sp. (Pinle nga byay ma)	<i>Harpadon</i> sp. (Nga hnat)	<i>Pangasius</i> sp. (Nga dan)		<i>Lepturacanthus</i> sp. (Nga da gon)	<i>Odontamblyopus</i> sp. (Nga byet ni)
1	Khin tan	1800	6	62		✓	✓	✓	✓	✓			✓	✓					
		1800	6	76		✓	✓	✓	✓	✓			✓	✓					
		220	1 - 1.5	32															Operate in 1-1.5m deep water
2	Aung kan tha	50	3.5	76			✓		✓										
		35	2	19			✓			✓	✓								
3	Thein ngu	286	2	32		✓	✓			✓									
		400	1.5	76				✓											Only Lates sp
4	Zoat ka li	400	3	76		✓	✓	✓	✓										Lates sp
		400	3	76		✓	✓	✓	✓										Lates sp
5	Koe te su	660	1.5	62		✓	✓				✓	✓							
	minimum	35	1	19															
	maximum	1800	6	76															

Table 5. Drift gill net or Trammel net (Thone htat pike), their specifications and target fishes at the villages.

Sr	Village	Net measurement				Target fish											Remarks		
		Length (m)	Height (m)	Mesh size (mm)	Cover Mesh size (mm)	<i>Hilsa</i> sp. (Nga tha lauk)	<i>Otolithoides</i> (Nga pok thn, Nat ka daw)	<i>Polynemus</i> sp. (Ka ku yan. Nga pon nar)	<i>Lates</i> sp. (Ka ka dit)	<i>Arius</i> sp. (Nga yaung)	<i>Liza</i> sp. (Ka be loo)	<i>Sillago</i> sp. (Nga pa lway)	<i>Protonibea</i> sp. (ka tha hmyin)	<i>Lobotes</i> sp. (Pinle nga byay ma)	<i>Harpadon</i> sp. (Nga hnat)	<i>Pangasius</i> sp. (Nga dan)		<i>Lepturacanthus</i> sp. (Nga da gon)	<i>Odontamblyopus</i> sp. (Nga byet ni)
1	Aung kan tha	700	1.5	32	228		✓	✓	✓	✓	✓								
2	Aung kan tha	1600	4	76	508	✓	✓	✓	✓	✓			✓	✓					
3	Zoat ka li	700	1	25	152			✓			✓	✓							
4	Zoat ka li	1200	5	152	304 - 457			✓	✓	✓						✓			
	minimum	700	1	25	152														
	maximum	7000	4	152	508														

Table 6. Set gill net observed, their specifications and target fishes at the villages.

Sr	Village	Net measurement			Target fish											Remarks		
		Length (m)	Height (m)	Mesh size (mm)	<i>Hilsa</i> sp. (Nga tha lauk)	<i>Otolithoides</i> (Nga pok thn, Nat ka daw)	<i>Polynemus</i> sp. (Ka ku yan, Nga pon nar)	<i>Lates</i> sp. (Ka ka dit)	<i>Arius</i> sp. (Nga yaung)	<i>Liza</i> sp. (Ka be loo)	<i>Sillago</i> sp. (Nga pa lway)	<i>Protonibea</i> sp. (Ka tha hmyin)	<i>Lobotes</i> sp. (Pinle nga byay ma)	<i>Harpodon</i> sp. (Nga hnai)	<i>Pangasius</i> sp. (Nga dan)		<i>Lepturacanthus</i> sp. (Nga da gon)	<i>Odontamblyopus</i> sp. (Nga byet ni)
1	Wel pa dan	700	0.4	25					✓	✓	✓							
2	Kyikehto area	1200-3500	1.5	6	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	Koetesu fishing ground (Than za gar pike)
	minimum	700	0.4	6														
	maximum	3500	1.5	25														

Table 7. Set bag net, their specifications and target fishes at the villages.

Sr	Village	Net measurement						Target fish											Remarks		
		Length (m)	Width (m)	Height (m)	Mesh size (mm)	Cod end Length (m)	Cod end Mesh size (mm)	<i>Hilsa</i> sp. (Nga tha lauk)	<i>Otolithoides</i> (Nga pok thn, Nat ka daw)	<i>Polynemus</i> sp. (Ka ku yan, Nga pon nar)	<i>Lates</i> sp. (Ka ka dit)	<i>Arius</i> sp. (Nga yaung)	<i>Liza</i> sp. (Ka be loo)	<i>Sillago</i> sp. (Nga pa lway)	<i>Protonibea</i> sp. (Ka tha hmyin)	<i>Lobotes</i> sp. (Pinle nga byay ma)	<i>Harpodon</i> sp. (Nga hnai)	<i>Pangasius</i> sp. (Nga dan)		<i>Lepturacanthus</i> sp. (Nga da gon)	<i>Odontamblyopus</i> sp. (Nga byet ni)
1	Khin tan	12	4.5	3.5	12 - 50		15		✓	✓	✓	✓	✓						✓	✓	Taing htaung kyar
2	Koe te su	25-35	8-9	2.5 - 3.5	62 - 101		12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	Several sp. and shrimp (Stow net, Kyar pike)
3	Kyaikto area	25 (wing) 8.5 (body)	0.75	0.16		No cod end	30		✓	✓	✓	✓	✓	✓							Only juvenile (Nga yaung pike)
	minimum	12	0.75	0.16	12																
	maximum	35	9	3.5	101																

Table 8. Beach seine net, their specifications and their target fishes at the villages.

Sr	Village	Net measurement			Target fish											Remarks		
		Length (m)	Height (m)	Mesh size (mm)	<i>Hilsa sp.</i> (Nga tha lauk)	<i>Otolithoides</i> (Nga pok thn, Nat ka daw)	<i>Polynemus sp.</i> (Ka ku yan. Nga pon nar)	<i>Lates sp.</i> (Ka ka dit)	<i>Arius sp.</i> (Nga yaung)	<i>Liza sp.</i> (Ka be loo)	<i>Sillago sp.</i> (Nga pa lway)	<i>Pratonihea sp.</i> (Ka tha hmyin)	<i>Lobotes sp.</i> (Pinle nga byay ma)	<i>Harpodon sp.</i> (Nga hnat)	<i>Pangasius sp.</i> (Nga dan)		<i>Lepturacanthus sp.</i> (Nga da gon)	<i>Odontamblyopus sp.</i> (Nga byet ni)
1	Ywar tan she	396	2.75	19			✓	✓		✓					✓			
2	Zoat ka li	30	1.5	19		✓	✓	✓	✓	✓						✓		
	minimum	30	1.5	19														
	maximum	396	2.75	19														

FISHER OPINIONS ABOUT THE FISH AND FISHERIES

Fisher folks are asked their opinions about the fishery resources and situation in their areas. According to their responses and . Based on their experience in fishery business

- It was easy to catch 10 viss of fish in a drift about 10 years ago. But, nowadays, it is difficult and uncertain even five viss.
- Fishery resources have been depleting and catch has been dropped significantly. Consequently, fisheries business will be stopped and fisher will be in trouble for their living.
- Hilsa and, big and quality fishes are very scarce in the catch because of, mainly, over fishing.
- Do not stop fishing during the spawning season.
- Increase in fishers and fishing boats.
- Small mesh size (one inch and less) nets have been used in near shore fishing.
- The main threat to the east coast of the Gulf of Mottama fishery is illegal fishing with several miles long set gill nets which is locally known as “Than za ga pike”.
- Illegal fishing has been practicing in the area by ignorance and allowance as legal practice of local authorities and very weak enforcement.

SUGGESTIONS

- (a) Urgent action must be taken on the illegal fishing, especially small mesh size nets e.g. Than za gar pike, in the area.
- (b) Law enforcement should be escalated during the spawning season and closed season.
- (c) More cooperation and collaboration of the local authorities are needed in conservation activities of Gulf of Mottama.
- (d) Awareness should be raised among fisheries officers, local authorities and the local fishing community for sustainable use of marine fishery resources.
- (e) Further extensive fishery studies and awareness raising should be done in order to know many aspects of the fishery situation in the Gulf of Mottama area.

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OCUMENTARY PHOTOGRAPHS



Fishermen explanation about a drift gill net structure.



Interview with a village authority.



Net observation (drift gill net).



With village authority at Koe te su village.



A visit to Township Department of Fisheries office in Kyaikto.



Fish market at Khintan village.



Set bag nets at Ahlat area.



An interview with a fisher in fishing ground.



Fish identification.



Interview with fish sellers.



Catch by a set gill net (Thazaka pike).



An Interviewed at Ywar tan she village.



A fisher from Aung kan tha village.



Net observation at a fishing village.



Set gill net (25 mm).



Net observation by a researcher.



Set bag net fishing.