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Fishing practices of the small scale fisheries in the selected coastal barangays of Malita, Davao Occidental

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Abstract
Small scale fishery is very important in many regions especially in developing countries. Their catches mostly contributed to the food being served in the table of middle to low income family. This study was conducted to identify the different fishing practices, catch composition and volume, fishing gears and the perception of the fishers in certain government restrictions implemented in the municipal waters of Malita, Davao Occidental. The researcher interviewed a total of 60 fishers in two fishing communities of the municipality barangay Tubalan and barangay Fishing Village. Based on the result of the study, majority of the fishers were male at the age bracket of 41-50 years old (Tubalan) and 31-40 years old (Fishing Village) with fishing experience of 1-10 years for Tubalan fishers and 11-20 years for Fishing Village Fishers. Most of the fishing family annual income range from 30,000 to 69,000.00 pesos. Fishers in both barangay spend their time fishing in the municipal waters of Malita and sometimes venture outside the municipal waters but within the Davao Gulf. Fishing practices were mostly passive (line fishing) with mist catch comprising pelagic fish species (scads, Tunas and squids). Fishers in both barangay agree that fishing restriction must be implemented to maintain fish catch and to sustain fish production in the area, fishing practices like blast and cyanide fishing were strongly supported by the fishers to be restricted and they know that implementation of fishing restriction in specific fishing practices is beneficial to them.

Keywords: Fishing grounds, fishing gears, fishing practices, Davao gulf

1. Introduction
Small scale fishery plays a vital role both in developed and developing countries. Majority of the small scale fishers are in the tropical region as they predominantly fishing or gleaning for tropical marine fishes and invertebrates that was accessible by simple fishing gears, free diving and intertidal gleaners [1]. A small-scale fishery is recognized as fishers who catch fish mainly for daily consumption and sustenance. These fishers in contrast with the commercial fisherman that uses big fishing vessels and updated technology in fishing, they only used low-tech gears and small boats floating in the municipal waters in the area [2, 3]. In the Philippines, small scale fisheries play an essential role in the income generation of coastal communities and in the country [4]. A reported annual harvest of 1.3 metric tons of fish was harvested from the nation's vast municipal waters. This fisheries sub-sector gives an important impact on the economy and produce majority of the dietary protein through fish consumption for over 90 million Filipinos thus provides adequate employment for individuals who want to engage in fishing [5].
A study conducted by Muallil *et al*. (2014) [6] reveal that most of the coastal fisheries resources in the Philippines may distorted because of the over exploitation alone even if certain laws and ordinances has been implemented. Small scale fisheries were also vulnerable towards climate change that affects the natural phenomena like changes in weather patterns, frequency and intensity of rainfall, occurrence of typhoons that leads to obliteration and flooding [7]. To minimized the negative effect that brought by the destruction of natural calamities and unsustainable fishing technique towards small scale fishers and the coastal community, efforts must be made towards conservation of fishery resources like stricter enforcement of law against unlawful fishing. In terms of natural calamities, study showed that there were mitigation and adaptation regime that could decreased the potential impacts of climate change in the fisheries sector [8, 9].
A continued decline of catch in the municipal waters of the Philippines leads to reducing fishing effort or intensifying fishing effort, halting fishing activities temporarily,

diversification of livelihoods and change in fishing technique and gears, of the small scale fishers [10, 11]. Most common fishing techniques used by the small scale fishers were compressor fishing, gill net fishing, long line fishing, multiple hand line, troll fishing and spear fishing [12-16]. Destructive fishing practices like dynamite and cyanide fishing to catch and target snapper and grouper still exist even if there was an existing law prohibiting such illegal fishing activity [17]. Several studies showed that fishing practices in the municipal waters and places in the sea with existing fish aggregating device contributed to the decline in the fish stocks especially within an area with increase fishing pressure, extensive fishing, over exploitation, destructive fishing and weak execution of guidelines in relation to sustainable fish resources [13, 18-21].

In this paper, the researcher wanted to assess the different fishing techniques used by the small scale fishers in the selected barangay of Malita, Davao Occidental. Fishers in the selected study site was interviewed in order to identify the existing fishing practices, volume of fish catch, catch composition, fishing gears used, and their perception on the restriction of a certain fishing method.

2. Materials and Methods

2.1 Research Locale

The study was conducted in the barangays of Fishing Village and Tubalan in the municipality of Malita, Davao Occidental with a recorded 800 registered fishers [22]. Barangay Tubalan and Fishing Village has a total population of 4, 462 and 3, 611 in 2020 census respectively, this barangays were dominated by fisher folks that have small motorized boats and their main source of food and livelihood was the adjacent municipal sea water of Malita (figure 1).

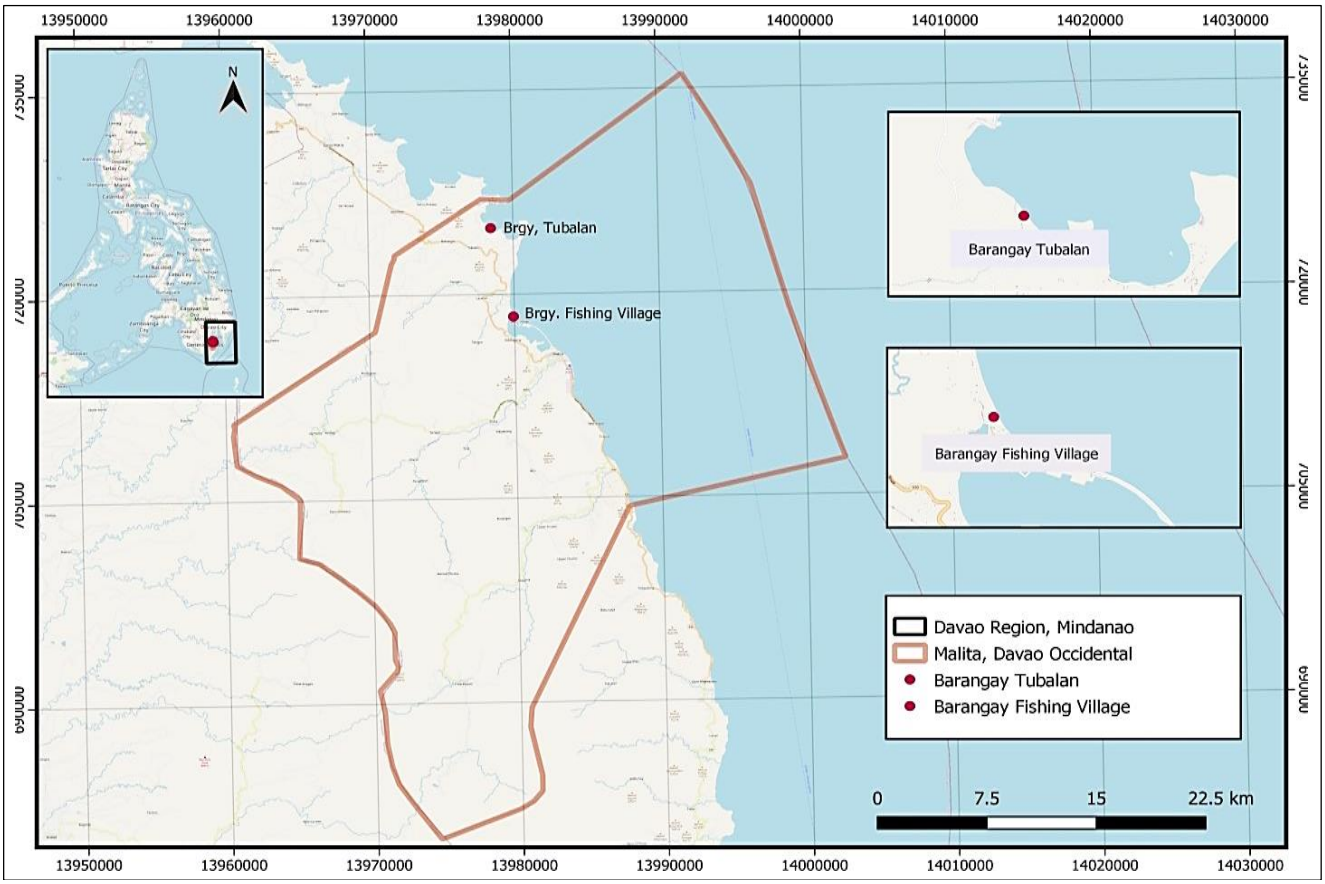

Fig 1: Map of study area in Malita, Davao occidental

2.2 Data Collection

The gathering of data in the study to determine the different fishing practices in two coastal barangay in the municipality of Malita was done through personal interview using a self-structured survey questionnaire in English language but translated into Visayan dialect to facilitate easy comprehension of the small-scale fishers. The respondents in the survey were fishers and residents of barangay Tubalan (n=30) and Fishing Village (n=30) who were directly involved in fishing activities in Malita's municipal seawater (15 kilometers perpendicular to the shoreline) or in the Davao Gulf in which Malita was one of the coastal municipalities that lies in its coastline (R.A. 8550) [60]. Respondents were questioned based on the administered self-structured survey questionnaire.

Fig 2: Fishers Included in the Study

2.3 Data Analysis

The data obtained in the study was analyzed through

descriptive statistics in Microsoft excel 2010 to obtain the mean and percentage of the study and to identify which fishing practices was commonly used by the fishers in the study site as well as to determine the perception of the small scale fishers on the different variables (maintain fish catch, support to fishing practices and type of fishing practices restriction, benefits of fishing practices restriction) in terms of fishing restriction.

3. Results and Discussion

3.1 Small scale fisheries in Brgy. Tubalan and Brgy. Fishing village

Based on the result of the study, the fisherman's socioeconomic background varied from age, years of fishing, number of fishers in the family, fishing time, fuel consumption, boat power, annual, monthly and per fishing trip income. Most of the fishers in barangay Tubalan was belong to the age bracket of 41-50 years old (40%) and in Brgy Fishing Village was in the age bracket of 31-40 years old (36.67%) and 30% of the fishers considered in the study in both barangay belongs to the age bracket of 41-50 years old. The same study was conducted in Davao region with the comparable result as to the age of the fishers involved in small scale fishing [9]. The mean age (43) of fishers engage in fishing in the study has already passed their potent days that reflects in the decreased in fish catch of the fishers as they cannot sustain their stamina and energy during the whole duration of fishing in every fishing trip and possibly could impact on the decline of the fish production in the small scale fishery sector [7, 23]. The number of fishing years of the small scale fishers included in the study in barangay Tubalan was 1-10 years (26.67%) while in barangay Fishing Village was 11-20 years (40%) and 30% of all fishers in the study spend their life in fishing for 11-20 years. The number of years of fishing of fishers also corresponds to the change of fish catch composition in every decades they spent fishing in the sea [24]. Majority of the small scale fisher was unable to adapt to the change of depleted marine resources in which they rely on so much that even with the long years of fishing, the fishers was incapable of changing to the new technologies that allows them to fish outside the municipal waters [10]. Fisher households are vulnerable to a variety of crises and shocks, which adds to their already precarious situation, making them less economically resilient [25]. The fishers in Barangay Tubalan and Fishing Village said that they are the only member of the family who was involved in fishing activities as reflected in the result in barangay Tubalan (60%) and barangay Fishing Village (46.67%). The growing economy outside fishing industry reflects the decreased of the number of fishers in a certain community and because of the difficult life of a fisherman, the lack of credit, decreased living conditions, insufficient food and clothing and lack of access to social services, most fishermen no longer wish to teach their children their trade [9, 26] (table 1).

Fishing time spent in every fishing trip of the small scale fishers was different in both barangay. Barangay Tubalan spend 24 hours or less (76.67%) in Fishing while majority of the fishers in barangay Fishing Village spend 72 hours (46.67%) in the sea to catch fish and 55% of the fishers in both barangay said that they fish 24 hours or less in the sea. The time spent by fishers in barangay Tubalan and Fishing Village in the study was in congruence with the result of the study conducted by Macusi *et al*. (2021) [7] in which most of the small scale fishers spend 7.29 hours in the sea for fishing activity. A study of Fung *et al*. (2013) [27] reveal that fishing duration together with target fishing and harvesting rate may significantly influence the decline in fish stocks in the marine environment. Fishing duration data could be used to assess the effects of fishing on target and non-target fish stocks, as well as the influence of management techniques on anglers [28]. The majority of the fishers in barangay Tubalan consumes 1-10 liters of fuel (43.33%) for fishing and in barangay Fishing Village 60% of the fishers consumes 11-20 liters of fuel, in both barangay most fishers consumes 11-20 liters of fuel (40%) in every fishing trip. Most fishers in barangay Tubalan used non-motorized boat (33.33%) and 10-13 horse power engine (33.33%) while in barangay Fishing Village majority of the fishermen used 10-13 horse power (46.67%). Engine power, fuel consumption and duration of fishing was inter related in each other, since most fishers consumes less fuel (11-20 liters (40%) if they spend less time in fishing (≤ 24hrs (55%) and if they used less engine power (10-13 HP (40%). Increase fuel consumption and fishing time could also mean that there was an increase in nitrogen oxide emitted in the atmosphere through the boat engine exhaust [29]. Certain technologies were already developed and practice to reduce fishing time and decreased fuel consumption, application of LED in squid jigging fishery, used of diesel engine and surface piercing propeller and installation of stern flap to decrease the boat resistance in water to name a few [30-32]. The adaptation of this new technology in fishing to reduce fuel consumption and increase efficiency in fishing was very effective to reduced pollutant gas and particulate emission and already practiced in present times [33] (table 1).

Fisheries socio-economic data, including income was frequently not available thus leading to the difficulty to measure fishermen's economic situation [34]. Based on the result of the study 35% of the fishers income was P50,000.00-P69,000.00 which in barangay Tubalan fishers have an annual income of P30,000.00-P49,000.00 (33.33%) and in barangay Fishing Village 50% of fishers have an annual income ranging P50,000.00-P69,000.00 only, a huge discrepancies from the average annual income (P 267,000.00) for a Filipino family which means that fishers income were below the minimum annual income set by the government. This result was in congruence with the study conducted by Outeiro *et al*. (2018) [35] in Spain that most of the small scale fishers have a net income equal or below the national minimum wage set by Spanish Government. One factor of the low income of fishers was because of the market value integration of their catch by the traders leading to unequal generated income between fishers and traders [36]. According to Salas *et al*. (2007) [37], small scale fishers in Mexico, like those in other regions, exhibit comparable characteristics such as low capital and labor intensive, weak market and bargaining strength among fishers (table 1).

Table 1: Respondents socio-economic profile in BRGY, Tubalan and BRGY, fishing village, Malta, Davao Occidental

Characteristic		Brgy. Tubalan		Brgy Fishing Village		Total	
		N=30	(%)	N=30	(%)	N=60	(%)
Gender	Male	28	93.33	30	100.00	58	96.67
	Female	2	6.67	0	0.00	2	3.33
Age (Year)	11-20	2	6.67	0	0.00	2	3.33
	21-30	6	20.00	5	16.67	11	18.33
	31-40	2	6.67	11	36.67	13	21.67
	41-50	12	40.00	6	20.00	18	30.00
	51-60	6	20.00	5	16.67	11	18.33
	61-70	2	6.67	3	10.00	5	8.33
No. of Years Fishing	1-10	8	26.67	7	23.33	15	25.00
	11-20	6	20.00	12	40.00	18	30.00
	21-30	7	23.33	5	16.67	12	20.00
	31-40	7	23.33	3	10.00	10	16.67
	41-50	2	6.67	3	10.00	5	8.33
Number of Fishers in the Family	1	18	60.00	14	46.67	32	53.33
	2	6	20.00	10	33.33	16	26.67
	3	3	10.00	5	16.67	8	13.33
	4	1	3.33	1	3.33	2	3.33
	5	1	3.33	0	0.00	1	1.67
	6	0	0.00	0	0.00	0	0.00
	7	1	3.33	0	0.00	1	1.67
Annual Income (Peso)	10,000-29,000	8	26.67	3	10.00	11	18.33
	30,000-49,000	10	33.33	6	20.00	16	26.67
	50,000-69,000	6	20.00	15	50.00	21	35.00
	70,000-89,000	5	16.67	6	20.00	11	18.33
	90,000-109,000	0	0.00	0	0.00	0	0.00
	More than 110,000	1	3.33	0	0.00	1	1.67
Monthly Income (Peso)	1,000-5,000	23	76.67	26	86.67	49	81.67
	6,000-10,000	3	10.00	4	13.33	7	11.67
	11,000-15,000	2	6.67	0	0.00	2	3.33
	16,000-20,000	2	6.67	0	0.00	2	3.33
Per Fishing Trip Income (Peso)	100-300	12	40.00	5	16.67	17	28.33
	310-500	11	36.67	22	73.33	33	55.00
	510-700	0	0.00	3	10.00	3	5.00
	710-1,000	3	10.00	0	0.00	3	5.00
	1,100-2,000	1	3.33	0	0.00	1	1.67
	2,100-3,000	1	3.33	0	0.00	1	1.67
	3,100-4,000	2	6.67	0	0.00	2	3.33
Fishing Time (Duration of Fishing)	≤ 24	23	76.67	10	33.33	33	55.00
	48 hours	0	0.00	6	20.00	6	10.00
	72 hours	1	3.33	14	46.67	15	25.00
	≥73 hours	6	20.00	0	0.00	6	10.00
Fuel Consumption (L)	0	10	33.33	4	13.33	14	23.33
	1-10	13	43.33	7	23.33	20	33.33
	11-20	6	20.00	18	60.00	24	40.00
	21-30	0	0.00	0	0.00	0	0.00
	31-40	1	3.33	1	3.33	2	3.33
Boat Power (HP)	0	10	33.33	4	13.33	14	23.33
	5-6.8	7	23.33	5	16.67	12	20.00
	7-8	2	6.67	5	16.67	7	11.67
	10-13	10	33.33	14	46.67	24	40.00
	14-16	1	3.33	2	6.67	3	5.00

3.2 Common Fishing Grounds

The fishing activity of the small scale fisheries in barangay Tubalan (56.67%) and Fishing Village (100%) was concentrated in the municipal waters of Malita, however some fishers in barangay Tubalan derived their income in gleaning in the mangrove area found in the barangay (6.67%) and 36.67% of the fishers considered in the study in barangay Tubalan was fishing outside the waters of Malita and venture farther in the Davao Gulf in which a fishing ban was established in the months of June, July and August to give time of the pelagic fishes to reproduce and majority of the fishers from Malita was aware on the establishment of fishing ban during the said months [22]. The same fishing ban were also established in Zamboanga that resulted in the increase in sardines landed catch and improve society's welfare after implementation of the closed fishing season [38] (figure 3).

The municipal water of Malita covers 9 barangays in which Barangay Tubalan and Fishing Village was included. Barangay Tubalan have an existing marine protected area that has been monitored and studied by the Department of natural Resources in which many high economically valued fish has been existing and targeted for fishing like parrot fishes and surgeon fishes [39]. In Tubalan, Malita, Davao

Occidental, mangroves was one of the sources of income of fishers as they gleaned in the area and harvest bivalves, gastropods and other invertebrates like crabs and shrimps. Tubalan also was a recipient of various rehabilitation efforts from private and government sector to address the declining number of mangrove forest in the Philippines [40].

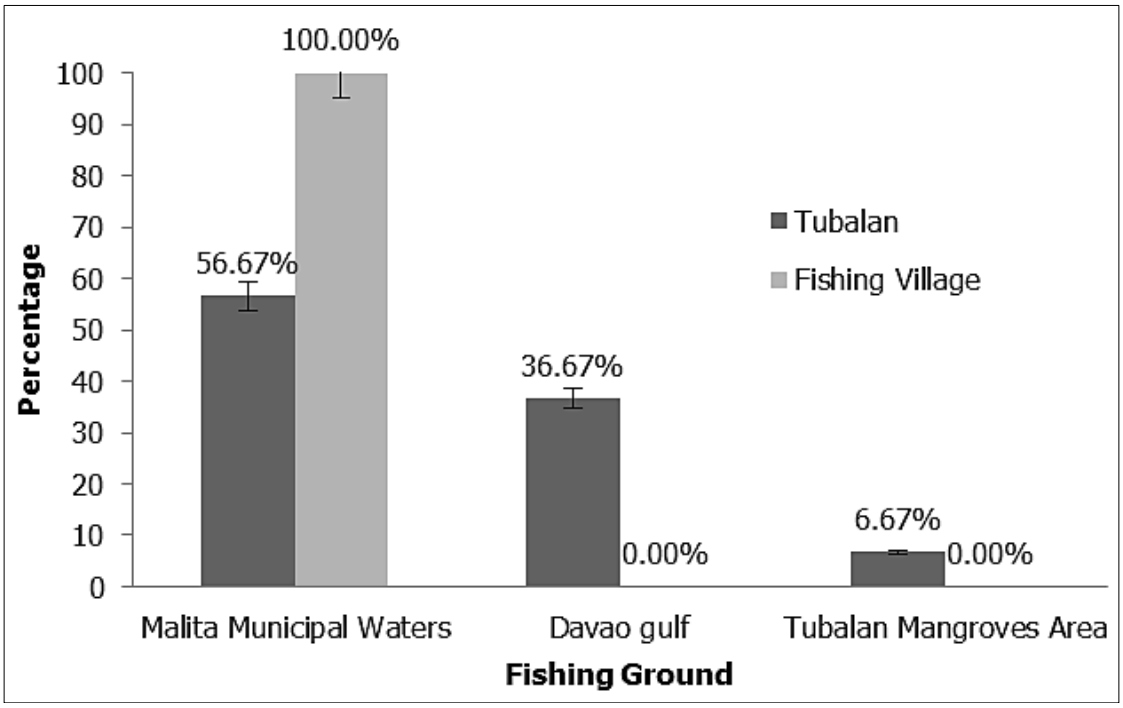

Fig 3: Common Fishing Grounds of Small-scale Fisheries in Brgy, Tubalan and Brgy. Fishing Village, Malita, Davao Occidental

3.3 Fishing Practices

The common fishing practices observed in the study were classified into passive and active fishing technique. Passive fishing was identified when a fisher folks install its fishing gears in the marine, brackish or fresh water environment and depends solely to the movement of water current to catch fish while fishing practices considered as active when the fisher folk actively chasing or targeting a fish species with the aid of a fishing gear [41]. Multiple hand line, simple hand line, troll line, long line, gill net, crab lift net were the active fishing practices observed in the study while beach seine fishing, spear fishing and gleaning was considered as active fishing practices observed in the study (table 2).

The same fishing practices and the corresponding gears used in fishing was also common in the fishers of Isabela, Philippines based on the study of Baleta *et al*. (2017) [16]. Illegal fishing practices like cyanide and dynamite (blast) fishing was not practiced in both barangay since this fishing technique increases the degradation rate of marine habitat and resources and as to the strict implementation and proper enforcement of fisheries law in the Philippines [42, 43].

Fig 4: Different fishing gears used by fishers, (A. undak, B. Palangre, C. Sibid, D. Pasol, E. Pana, F. Sundang, G. Pamante, H. Baling)

Table 2: Common fishing practices used by the small-scale fisheries in Brgy, Tubalan and Brgy, Fishing Village, Malita, Davao Occidental

English Name	Local Name	Fishing Practices Classification	Tubalan	Fishing Village
A. Lines				
1. Multiple Hand Line Fishing	Kawil, Pasol, Undak	Passive	√	√
2. Simple Hand Line Fishing	Pasol, Pingwitay	Passive	√	√
3. Troll Line Fishing	Sibid, Pasol	Passive	√	√
4. Long Line Fishing	Palangre, Pasol	Passive	√	√
B. Net				
5. Gill Net Fishing	Pamante	Passive	√	X
6. Crab Lift Net Fishing	Bintol	Passive	√	X
7. Beach Seine Fishing	Baling, Bira-Bira	Active	X	√
C. Hand Instrument				
8. Spear Fishing	Pana	Active	√	√
9. Gleaning	Panginhas	Active	√	X

√ = Observed fishing practices in the study.
X = Not observed fishing practices in the study.

Active and passive fishing technique was practiced by fishers in both barangays, there were 2 active fishing practices (spear fishing and gleaning) and 6 passive fishing practices (Multiple and simple hand line fishing, troll line fishing, long line fishing, gill net and crab lift net fishing) used by the fishers in barangay Tubalan. In barangay Fishing Village, 4 passive (Multiple and simple hand line fishing, troll line fishing and long line fishing) and 2 active (beach seine fishing and spear fishing) fishing practices was noted in the study (figure 5).

The active fishing practices was characterized by movement to pursue and catch fish while passive fishing practices allow fish to move towards the fishing gear without any movements of the gear to trigger the catch [15]. The same fishing practices and fishing gears was also used by small scale fisher in Palanan, Isabela, Philippines in which it was dominated by lines, net and hand gears used in fishing [44].

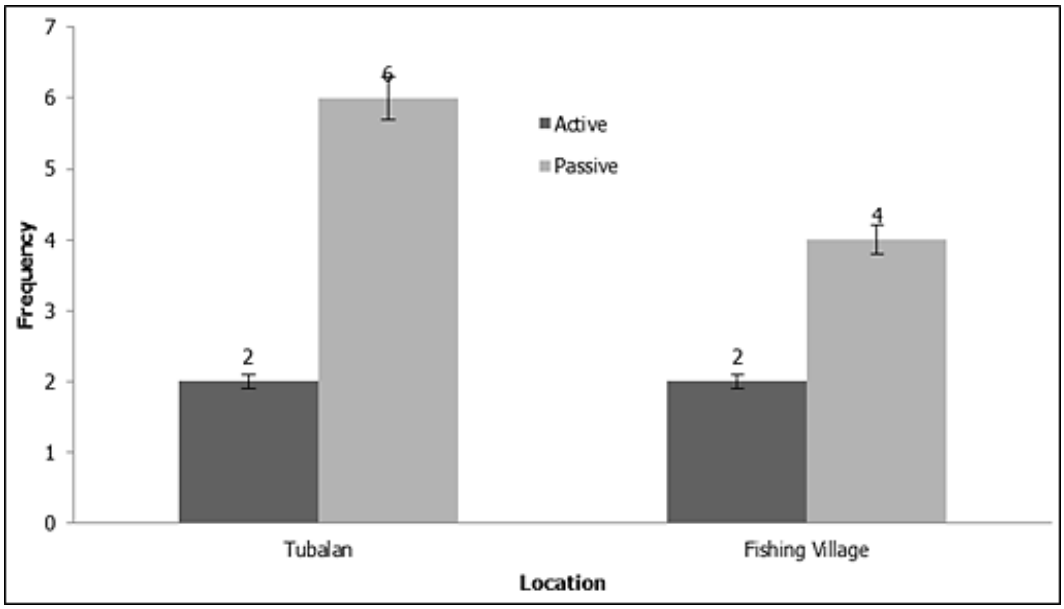

Fig 5: Frequency of Active and Passive Fishing Practices in Brgy, Tubalan and Brgy, Fishing Village, Malita, Davao Occidental

3.4 Catch Composition of Fishing Gears

The Diversity of fish catch by the small scale fisheries reflects to the area in which they usually fished as it was the only area that the boat they operate reaches since most of the small scale fishers navigates smaller boats compared to that of commercial fishers, and because of the smaller size boats they used, they can easily access the rich coastal shallow water that covers a wide variety of fish, crustaceans and invertebrates [2, 3, 45]. There were 33 species documented belonging 24 different families or groups that composed of fish, mollusk, cephalopods, crustaceans and echinoderms caught by different types of fishing practices and gears of the small scale fishers in Tubalan and Fishing Village. The common catch of the small scale fishers in barangay Tubalan and Fishing Village was presented in table 3.

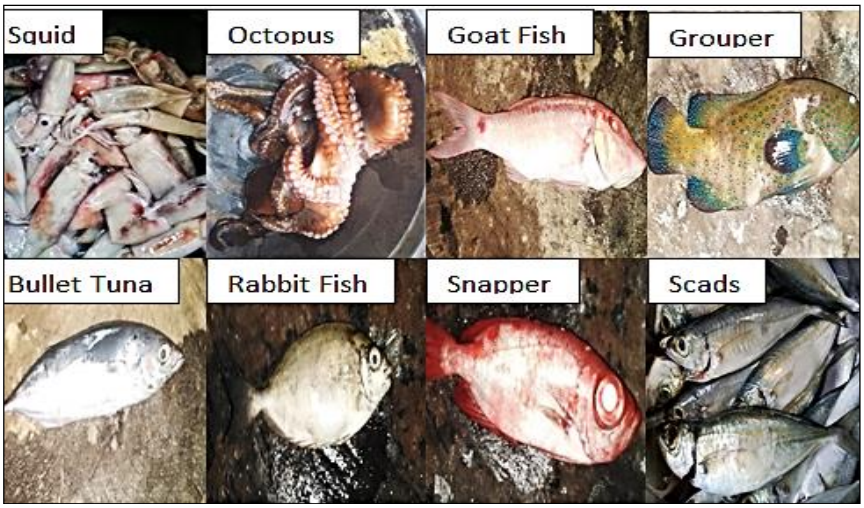

Fig 6: Common Fished catch by small scale fishers in the study

Fish species under the family of *Scombridae*, *Carangidae* and *Loligilidae* was the top 3 catches in terms of volume of catch of fishers in both barangay. Yellow Fin Tuna, Spotted Snapper and groupers were the fish species with high market value in all fish catch noted in the study. Even though coral reef fishes have higher market price, it was observed in the study that the fishers catch less of this fish species compared to that of the pelagic fishes like the scads and tuna this was because of the degradation of the coral reefs that leads to low reef fish abundance and biomass [46, 47]. Also, over exploitation in the fisheries resources in the coral reefs by small scale fishers become problematic because it influence on the reduction of biodiversity and fish catch [11].

Table 3: Common fish catch by the small-scale fishers in Brgy, Tubalan and Brgy. Fishing Village, Malita, Davao Occidental

Family Name	English Name	Local Name	Volume of Fish Caught per Trip		Selling Price
			Tubalan	Fishing Village	
A. Fish					
Scombridae	Bullet Tuna	Perit	10 Kg	5-10 Kg	P80.00-P100.00/Kilo
	Yellow Fin Tuna	Bariles/Tuna	40-70 Kg	50-70 Kg	P200.00-P280.00/Kilo
	Skip Jack Tuna	Tulingan	X	20 Kg	P120.00-P140.00/kilo
Siganidae	Rabbit Fish	Dangit	1 Kg	1-2 Kg	P120.00-P160.00/Kilo
	Rabbit Fish	Kitong	0.5-5 Kg	2-3 Kg	P150.00-P200.00/Kilo
Lutjanidae	Big Eye Snapper	Big Eye	0.25-1 Kg	X	P120.00-P130.00/Kilo
	Spotted Snapper	Aluman	0.75 Kg	X	300/Kilo
	Lunar Tail Snapper	Katambak	0.75-8 Kg	X	P120.00-P240.00/Kilo
Carangidae	Big Eye Scads	Matambaka	2.5-20 Kg	5-15 Kg	P100.00-P150.00/Kilo
	Scads	Burot	X	15 Kg	P120.00/Kilo
Mullidae	Goatfish	Timbungan	1-3 Kg	X	P180.00-P200.00/Kilo
Acanthuridae	Surgeon Fish	Bagis	0.8-1.5 Kg	X	P60.00-P80.00/Kilo
Coryphaenidae	Dolphin Fish	Pandawan	X	4-20 Kg	P140.00-P160.00/Kilo
Serranidae	Groupers	Lapu-lapu	0.5-3 Kg	3 Kg	P200.00-P280.00/Kilo
Lethrinidae	Emperors	Anopin	X	2 Kg	P120.00/Kilo
Scaridae	Parrot Fishes	Mol-mol	2 Kg	5 Kg	P130.00/Kilo
Lobotidae	Black Perch	Puyo	1.5-4 Kg	X	P70.00-P80.00/Kilo
Belonidae	Needle Fishes	Balo	0.75 Kg	X	P90.00/Kilo
Nemipteridae	Breams	Lagan	0.5 Kg	X	P120.00/Kilo
Terapontidae	Tiger Perches	Bugatong	3 Kg	X	P80.00/Kilo
Labridae	Wrasse	Labayan	1 Kg	X	P160.00/Kilo
Pomacentridae	Ambon Damsel	Pata	1 Kg	X	P150.00/Kilo
Istiophoridae	Blue Marlin	Marang	60 Kg	X	P160.00/Kilo
B. Mollusc					
Lingulidae	Brachiopod	Ugpan	0.25 Caltex	X	P20.00/Caltex
Arcidae	Blood Cockle	Litob	2-3 Caltex	X	P20.00-P30.00/Caltex
Ostreidae	Oyster	Sisi	3 Caltex	X	P20.00/Caltex
Cyrenidae	Mangrove clam	Tuway	3 Caltex	X	P25.00/Caltex
C. Cephalopads					
Loligilidae	Squid	Nukos	3-20 Kg	3-20 Kg	P80.00-P100.00/Kilo
Octopidae	Octopus	Kugita	X	2 Kg	P120.00/Kilo
D. Crusteceans					
Portunidae	Blue Swimming Crabs	Lambay	1 Kg	X	P50.00/Kilo
E. Echinoderms					
Echinodea	Sea Urchin	Salawaki	6 Caltex	X	P30.00/Caltex

X = No fish catch recorded in the study area.

Different fishing practices have varied fish catch based on the gears used in every type of fishing techniques. Hook and lines were specialized to catch commercially valuable fish species like snappers, tuna, scads, emperors, surgeon and demersal fishes. Net fishing commonly catches scads, crabs, snappers and rabbit fishes while fishing with hand instrument like spear fishing and gleaning usually catches octopus, rabbit fish, groupers, snappers, emperors and parrot fishes while most catch in gleaning was dominated by sedentary invertebrates beneath the substrate like clams and bachipods, oyster and urchins was also caught through gleaning in the surface waters or in the substrate as observed in the study (table 4). A comparable catch of fish species was also documented in the study conducted at the two coastal areas in Palawan, Philippines in which almost the same fish species was observed caught by the different types of fishing practices and fishing gears used [15].

Table 4: Common fish catch by different fishing practices used in Brgy. Tubalan and Brgy, Fishing Village, Malita, Davao Ocidental

Fishing Practices	Local Name	Common Catch
A. Lines		
1. Multiple Hand Line Fishing	Kawil, Pasol, Undak	Big eye Scads, Scads, Bullet Tuna, Squid, Skip Jack Tuna
2. Simple Hand Line Fishing	Pasol, Pingwitay	Big eye Scads, Scads, Bullet Tuna, Goat Fish, Surgeon Fish, Emperors, Black Perch, Ambon Damsel
3. Troll Line Fishing	Sibid, Pasol	Yellow Fin Tuna, Blue Marlin, Dolphin Fish
4. Long Line Fishing	Palangre, Pasol	Groupers, Snappers, Breams, Tiger Perches, Wrasse
B. Net		
5. Gill Net Fishing	Pamante	Scads, Goat Fishes, Snappers, Rabbit Fishes
6. Crab Lift Net	Bintol	Blue Swimming Crabs
7. Beach Seine	Baling, Bira-bira	Scads, Needle Fishes
C. Hand Instrument		
8. Spear Fishing	Pana	Octopus, Rabbit Fish, Groupers, Snappers, Emperors, Parrot Fish
9. Gleaning	Panginhas	Brachiopad, Blood Coockle, Oyster, Sea Urchin

3.5 Fishing Practices Restriction

Small scale fisheries creates problems such as lowers biodiversity and catch because of over exploitation and law informant might play a role in this system [11]. The survey on the restriction of a certain fishing practices was conducted in barangay Tubalan and Fishing Village with 30 respondents in each barangay. A self-structured survey questionnaire was used and was translated to visayan dialect to facilitate easy comprehension of the fishers included in the survey. The respondents was asked about the restriction of a certain fishing practices and their idea on the level of acceptance on fishing restriction of their co-fishers (table 5).

Majority of the fishers completely agrees (Tubalan 40%; Fishing Village 73.33%) if a fishing restriction will be implemented, however when the fishers asked about the perception of the other fishers in fishing practices restriction, 46.67% of the respondents in baranagay Tubalan was neutral while in barangay Fishing Village majority of the fishers said that their co-fishers completely agrees (73.33%) in the establishment of fishing practices restriction. The high percentage of acceptance on the idea of fishing practices restriction of the small scale fishers reflected that they wanted to sustain the fishery resources and it would greatly affects their livelihood and fish catch [9, 26, 35]. A study on a fishing restriction positively affects the area with implemented fishing restriction as it was observed higher abundance of marine resources compared to the area open for any fishing [48]. The same study conducted by Mcclanahan and Abunge (2016) [49] in Madagascar and Mozambique state that fishers rated higher on benefits of restriction. Aslo, fishers manager in Kenya and Madagascar rated the same and acknowledge that establishment of fishing restriction principally helps the resource users to sustain its fisheries resources.

Table 5: Respondents Response on Fishing Restrictions

	Do you think Fishing practices restrictions are a good way to maintain fish catch?		Do you think other fishers would support the idea of Fishing Practices Restriction?	
	Brgy. Tubalan	**BRGY. Fishing Village**	**Brgy. Tubalan**	**Brgy. Fishing Village**
Don't know	0.00%	0.00%	0.00%	0.00%
Completely Disagree	3.33%	0.00%	0.00%	0.00%
Disagree Somewhat	0.00%	0.00%	3.33%	0.00%
Neutral	36.67%	0.00%	46.67%	23.33%
Agree Somewhat	20.00%	26.67%	10.00%	3.33%
Completely Agree	40.00%	73.33%	40.00%	73.33%

Marine resources continous to suffer from depletion through over exploitation and destructive and unregulated fishing practices [50]. Changes in the quantity, species composition, and behavior of target species all affect aquatic ecosystems through fishing activities [51]. Fishing techniques that targeted high-value fish species (e.g., Lutjanidae and Serranidae) have been restricted, and the results have been good in terms of fish biomass. However, if no restrictions are enforced, this marine resource will be subject to fisheries loss and population reduction [52]. Gear restrictions in particular was widely acepted compared to the closed seasons, speciess restrctions and minimum fish size [53]. Public participation is an important component of good governance, and there are numerous benefits to include stakeholders in decision-making [54]. Respondents in the study identified which observed fishing practices were needed to be restricted in order to maintain fish catch. The study listed eight common fishing practices spear fishing, crab lift net fishing, troll fishing, blast fishing, gill net fishing, long line fishing, multiple hand line fishing, and cyanide fishing. The fishing practices considered in the

study was identified with the help of local fisherman in the study area (table 6).

Fishing practices like mutiple hand line fishing (Tubalan 73%, Fishing Village 100%), long line fishing (Tubalan 76.67%, Fishing Village 100%), troll fishing (Tubalan 50%, Fishing Village 93.33%) and crab lift net fishing (Tubalan 40% (Don't Know), Fishing Village 96.67%) obtain higher percentage on the type of fishing that the fishers do not want to be restricted as this fishing practices were passive and not destructive. This fishing practices was considered as traditional and ecologically sustainable [41, 55]. Spear fishing (Tubalan 30% restricted and important; Fishing Village 30% not restricted) and gill net fishing (Tubalan 40% slightly restricted; Fishing Village 36.67% slightly restricted and important), this results means that fishers have the perception on the possible damage on the reefs as this fishing practices with its gears usually used on the coral reefs. This results support to the claim that spear fishing might affect to the decline of fishery resources especially the fish species with high market value in the coral reef area and a gill net fishing have reported to have higher chance of catching non targeted species and mojority of this species were trash fishes [56-59]. Blast fishing and cyanide fishing practices were perceived to be destructive and fishers were aware on the effects of this destructive fishing that may brought to the marine resources as reflected on the result that these two fishing practices obtained 80% in Tubalan and 100% in Fishing Village and 83.33% in Tubalan and 100% in Fishing Village respectively to be very important to have fishing restrictions. This would also means that local fishers in the area was aware on the existing law in the Philippines on dynamite and cyanide fishing stated in section 88 of the Philippine fisheries code of 1998 (Republic Act 8550) [60]. In a study conducted in Malaysia, blast and poison fishing was the major threats to marine resources that greatly affects the volume of catch of the fishers in the future [61]. However a study conducted in Tanzania in which destructive and illegal fishing was existing, local fishers continue to used dynamite fishing even if they know the destruction it may brought to the scarce resources as a result of weak enforcement and illegal fishers thought that they were neglected and ignored by the local fishing authorities as opposed to the findings of the study conducted in Loreto, Baja California Sur, Mexico in which majority of the fisherman amit and respected the existing regulations in force [21, 62]. Furthermore, according to Bailey and Sumaila (2015) [17], eliminating damaging fishing techniques could provide a steady flow of benefits to the community throughout time.

Table 6: Respondents Perception on a Particular Fishing Practices to be Restricted

	Not Restricted		Slightly Restricted		Important		Very Important		Don't know	
How much you like would to restrict a certain fishing Practices?	**Tubalan**	**Fishing Village**	**Tubalan**	**Fishing Village**	**Tubalan**	**Fishing Village**	**Tubalan**	**Fishing Village**	**Tubalan**	**Fishing Village**
Spear Fishing	26.67%	30.00%	30.00%	26.67%	30.00%	23.33%	6.67%	20.00%	6.67%	0.00%
Crab lift Net Fishing	13.33%	96.67%	23.33%	0.00%	23.33%	3.33%	0.00%	0.00%	40.00%	0.00%
Troll Fishing	50.00%	93.33%	20.00%	3.33%	6.67%	3.33%	0.00%	0.00%	23.33%	0.00%
Blast Fishing	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	80.00%	100.00%	0.00%	0.00%
Gill Net Fishing	10.00%	13.33%	40.00%	36.67%	20.00%	36.67%	6.67%	13.33%	23.33%	0.00%
Long Line Fishing	76.67%	100.00%	6.67%	0.00%	0.00%	0.00%	0.00%	0.00%	16.67%	0.00%
Multiple hand Line Fishing	73.33%	100.00%	6.67%	0.00%	0.00%	0.00%	3.33%	0.00%	16.67%	0.00%
Cyanide Fishing	0.00%	0.00%	0.00%	0.00%	16.67%	0.00%	83.33%	100.00%	0.00%	0.00%

3.6 Respondents Perception of Fishing Restriction (Self, Community, Government)

Many conservation programs throughout the world are grappling with how to increase the likelihood that resource users will participate in and follow management requirements. When resource users feel greater personal costs than gains from specific management activities, this is very typical [63]. Small scale fishers' perception on the benefits for themselves, community and government regarding on the idea fishing practices restriction was presented in table 7. Based on the result of the study majority of the fishers responded that fishing restriction was very beneficial (Tubalan 60%; Fishing Village 63.33%) to them since it helps on the sustainability of fisheries resources and destructive fishing practices will be prohibited to be practiced in fishing. Fishers acknowledge the favorable impact of fishing restrictions on the long-term health of fisheries, according to the same study, and have stated a desire for stricter management and improved implementation of the regulations [64]. However, fishers in both barangay have the idea that the community has less benefit (Tubalan 53.33%; Fishing Village 43.33%) and in barangay Tubalan (73.33%) fishers said that maybe the government could benefit from the fishing restriction while fishers in barangay Fishing Village (66.67%) said that Government have no benefits on the establishment of fishing restriction. The perception of the fishers specially in the government benefits on fishing practices and gear restriction perceived to be weak because of the monitoring and enforcement management in the existing laws and ordinances observed by the fishers [65]. The same study conducted by Pita, Pierce and Theodossiou (2010) [53] also states that majority of fishermen had a poor impression of government support for the fishing business, with only about a quarter believing that the government supports their activities (table 7).

Table 7: Respondents Perception on the Benefits of Fishing Practices Restriction

To what degree do you think you would benefit from Fishing practices restrictions?		**Tubalan**	**Fishing Village**
Self	I Don't know	0.00%	0.00%
	No Benefits	3.33%	3.33%
	Maybe Beneficial	16.67%	3.33%
	Less beneficial	20.00%	30.00%
	very Beneficial	60.00%	63.33%

Community	I Don't know	3.33%	0.00%
	No Benefits	0.00%	30.00%
	Maybe Beneficial	33.33%	13.33%
	Less beneficial	53.33%	43.33%
	very Beneficial	10.00%	13.33%
Government	I Don't know	3.33%	3.33%
	No Benefits	13.33%	66.67%
	Maybe Beneficial	73.33%	13.33%
	Less beneficial	6.67%	16.67%
	very Beneficial	3.33%	0.00%

Self = Respondents perception on the degree of benefit they may gain from fishing practices restriction.
Community = Respondents perception on the degree of benefit the community may gain from fishing practices restriction.
Government = Respondents perception on the degree of benefit the government may gain from fishing practices restriction.

4. Conclusion

Interviews with knowledgeable local fisherman may be important in analyzing and identifying the different fishing practices and their perception on the establishment of fishing restriction in order to maintain and conserve fisheries resources in the future, according to this contribution. This was highlighted by the result of the study that small scales fisheries played a vital role both in developed and developing countries. Small scale fishers in barangay Tubalan and Fishing were among the poorest in the country as manifested by their low annual income of P 48,433.33, a huge discrepancy from the average annual income (P 267,000.00) for the Filipino household. Most fishers included in the study fished at municipal waters of Malita with varied fishing practices used like lines (multiple hand line, simple hand line, troll line and long line fishing), nets (gill net, crab lift net, beach seine) and by hand (spear fishing and gleaning). All fishing practices with hook and line gears was classified as passive, Beach seine was the only active fishing practices for nets made gears and both spear fishing and gleaning was classified as active. Common fish species catch by different fishing practices were scads, tuna, and squid while most coral reef fishes have even though corresponds to higher market value was harvested less. Respondents was also asked on the idea of fishing practices restriction and they are well aware that blast fishing and cyanide fishing was very important to be restricted and has already an existing law in the country (RA 8550). Fishers also perceived that fishing practices restriction will positively impacts the depleted marine resources. This paper could be an important reference on the community based fishery management that the government spent more time and money to conserve the coastal resources in community perspective. Also, the rising focus on community-based fisheries management arises from the poor performance of other techniques and the study of traditional community-based natural resource management systems that have not only survived but also appear to function better than the alternatives [66].

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6. Conflict of Interest

The authors have declared that they have no conflicts interests exist.

7. Authors contribution

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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