



RESEARCH ARTICLE

EVALUATION ON THE IMPLEMENTATION OF JOINT ADMINISTRATIVE ORDER (JAO)
FISHING BAN AND ITS IMPACTS OF ENFORCEMENT

¹Leonardo D. Cainta and ^{2,*}Jane T. Aquino

¹Jose Rizal Memorial State University, Dipolog Campus

²Jose Rizal Memorial State University, Katipunan Campus, Philippines

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ABSTRACT

A comprehensive knowledge and the strict enforcement of the fishing ban are important attributes for increasing fish production. The study determined the knowledge of implementation of Joint Administrative Order (JAO) fishing ban, assessed the impacts of enforcement of the ban as to its current fishery operations and production, marketing and income and alternative livelihood activities for fishers' subsistence. Key informants interview and fish catch survey were conducted. Focus Group Discussion was employed to the categorized 460 respondents as fishers (86.95%), women's group (3.69%), buyers (1.95%), retailers (1.95%), processors (1.08%), LGUs (1.49%) and BFAR personnel (0.43%). The topics discussed were resources/ resource use and reactions towards implementation of JAO. Frequency counting and percent were used to determine the respondents' knowledge. Significant difference among the respondents income during the peak and lean months was employed using T test. The study revealed that the respondents possessed knowledge on the implementation of the ban. However, there was a significant difference of impacts among the respondents' socioeconomic conditions. Ironically, fishers earned net incomes between Php 3000- Php 300 during peak months and net income below Php 300 during lean months. Fishers are more marginalized during peak months. The fish retail price is as low as P 5.00 per kilo. Traders/compradors influenced the market price. The invested fuel and efforts commensurate to a zero catch due to the dominance of predators. Commercial fishing gears were visible within the municipal waters. Fishers attained elementary education (79.34%) which posed detrimental in the scarcity of opportunities. Aside from dried and brined fish activities, fishers engaged other alternative livelihoods for survival. Only those traders and processors were benefited. The sardines ban has boasted Dipolog City's fame as the "Bottled Spanish Sardines Capital of the Philippines".

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INTRODUCTION

The Philippines' longest coastline embedded with abundant resources has significant economic value. These coastal and marine ecosystems can provide the country a sustainable supply of fish, shellfish, seaweeds, algae and salt and other economic benefits. However, ironically the coastal communities who depend primarily on fish and other coastal and marine resources for their livelihood are among the poorest in the country with 4 out of 10 households are living under the poverty line. Fishers income levels are as low as PhP 24000.00 per year as compared to the national average income of PhP 144000.00. The high average annual catch of municipal fishers in the 90s is now reduced to a 30 percent as resulting effects of the competition of commercial fishing fleet,

overfishing and destructive fishing practices (www.environment.com.environment monitor 2005). Overfishing is a serious problem currently affecting the sardines stocks. With the strict fisheries management and improved habitat conditions, Pacific sardine populations began to recover and support a modest fishery (montereybayaquairum.org). A sustainable fish stocks and vast profits could be achieved by calling a temporary suspension to the catching of some of overfished sardine's species (Mason, 2012). The observance of the fishing ban in Palau had resulted to a long-term sustainability of fish catch. It was attributed to the well-managed fishery and fishing gear which resulted to the fast growth and maturity rate of sardines (Johnson, 2013). Sardines are the most important commercial fish under high demand for canned fish, fish meal and oil, and this species are fished to the point of commercial extinction. The Philippines ranked sixth among the top fish producing countries in the world in 2008 with a total production of 4.97 million metric tons of tuna, mackerel and sardines (www.bworldonline.com). However, there was a decline of

*Corresponding author: Jane T. Aquino,

Jose Rizal Memorial State University, Katipunan Campus, Philippines

16. 29 percent from the commercial fisheries with a production of 1,039,758. 58 metric tons. The decline can be attributed to the decreased in fishing efforts due to bad weather conditions, dry docking of fishing vessels and depletion of fish species due to unregulated fishing ordinance (BFAR and NFP, 2011). The introduction of a fishing ban around Apo Reef, the largest coral reef in the country brought positive impact to the abundance of reef and coral fish species (science daily. com, 2007). The local sardine industry in Zamboanga city projected to bounce back to the productive level following the three-month ban on sardine fishing (worldfishingtoday.com).

Zamboanga del Norte's coastal area of 12,206 hectares is rich with marine species of sardines, yellow fin tuna, herring, anchovies, mackerels, snappers, round scads, perches, marfins, squids and octopus (Figure 1). The bulk of sardine's catch of Zamboanga peninsula came from Zamboanga del Norte serving as the pride of the province. However, Bureau of Agricultural Statistics (BAS) data revealed that sardine catch declined from 12. 75 percent in 2003 to 9. 6 percent in 2010. To address this problem, BFAR implemented the joint DA-DILG administrative order number 1, series of 2011 in pursuant to Republic Act 8550 or the Philippine Fisheries Code of 1998. The order is geared to establish a spawning season for the three major species of sardines; Fimbriated sardine (malangsi), Indian sardine (tuloy) and Round dwarf herring (malangse) in East Sulu Sea. Basilan Strait and Sibuguey Bay known as the conservation area of about 13,987. 15 square kilometers encompassing the western municipal/national waters of Zamboanga del Norte (DA, 2012) (Figure2). The first implementation (December 1, 2011- March 1, 2012) turned out an overflowing catch in spite of the opposition of the fishing and cannery sectors. BAS revealed that Zamboanga region sardines production grew from 146,835. 66 MT to 156,153. 51 MT.

The second closure (December 1, 2012 - March 1, 2013) allowed the sardines species to breed and spawn and consequently increase in population substantially. BFAR reported the closure as an achievement for there was a joint cooperation by the fishing sectors, the association of canning industries as well as government law enforcement (www.mindanews.com/top-stories/2013/03/09/bfar...of-sardine-fishingban). A high level of understanding is a key to discovering impacts on the implementation. Data revealed that for the past six months, there was a recurring sardine fish catch around Dipolog Bay and had continued until the onset of the Northeast Monsoon (November) which is also the start of the sardine season (Local BFAR, 2012).

The relative abundance of sardine stocks is attributed to the strict implementation and close monitoring of the fishing ban. Thus, this research has been carried out to determine the knowledge of implementation of Joint Administrative Order (JAO) and relate it to the local ordinance fishing ban, assessed the impacts of enforcement of the ban in terms of current fishery operations and production, marketing and income, evaluated the existing alternative livelihood activities of the fishers' survival on the prevailing condition of poverty and to document the sardine fishery in the province. The results of the study would serve as the framework of establishing a connection of unified comprehension of the provisions embodied in the JAO to the target respondents and would link to address the issue of rigorous implementation and keen monitoring of the ban.



Figure 1. Location Map of the Study Area

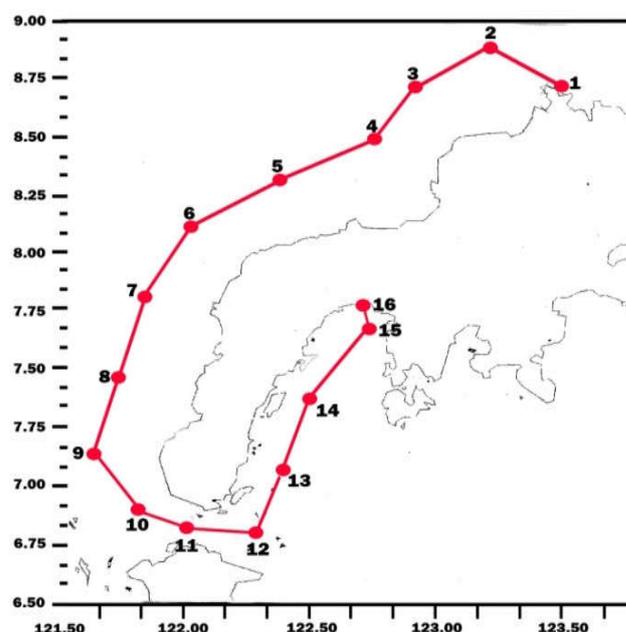


Figure 2. Conservation Areas for Sardines in Portions of East Sulu Sea, Basilan Strait and Zamboanga Sibugay (MAO- Katipunan)

METHODS

The study utilized the descriptive methods of research through the use of a questionnaire and documentary analysis. The questionnaire consisted of items on the basic demography; livelihood and fishing operations; fishery production; awareness and perception and economic impacts of sardine fishing ban. Secondary data were also gathered to strengthen the results of this study. Key informants and household interviews as well as fish catch survey were conducted using the two survey forms. A reconnaissance survey was also conducted in the preselected coastal barangays in each of the municipality which enabled the team to have a quick overview of the general condition of the coastal areas. Rapport was established with some local government officials and key community members. Focus Group Discussion (FGD) was also conducted to the respondents.

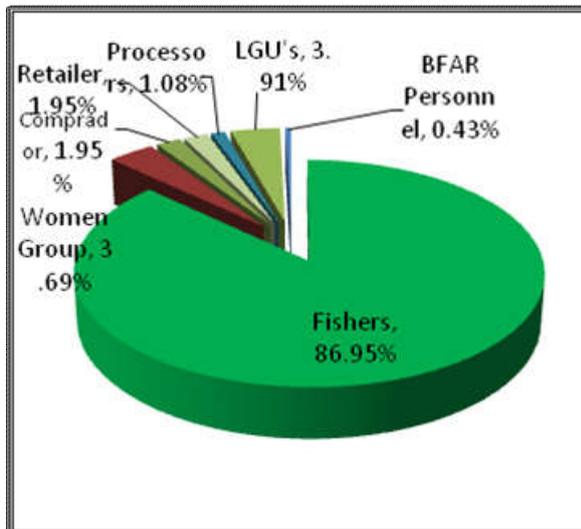
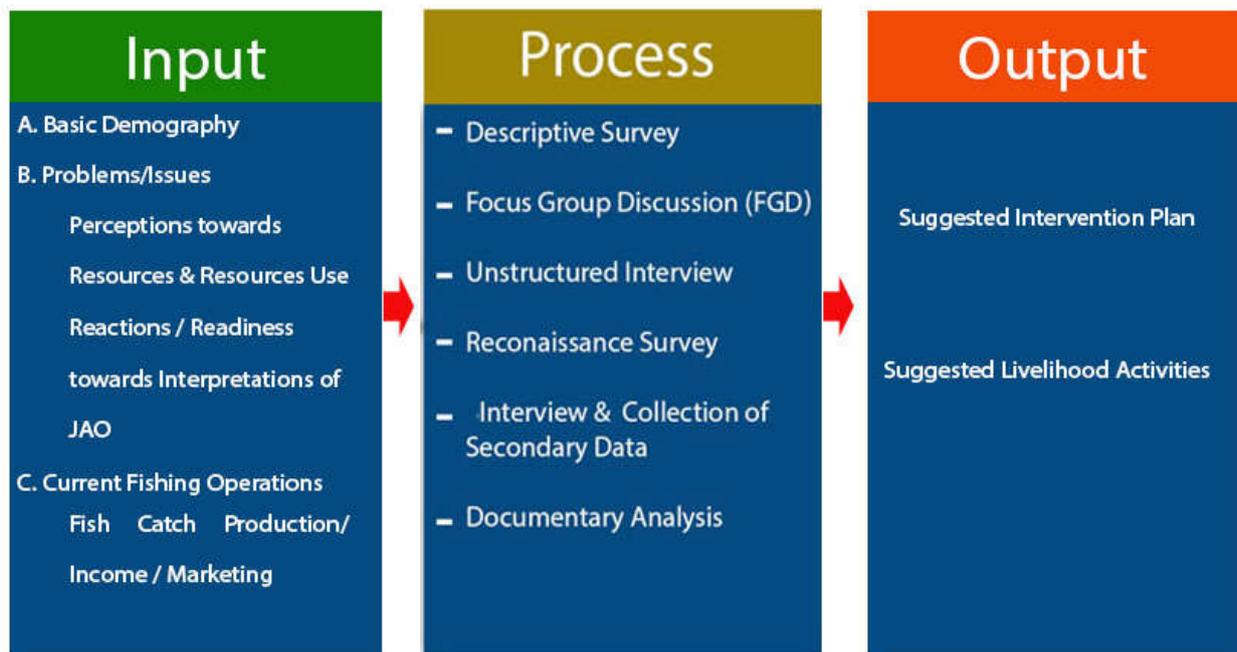


Figure 3. Respondents of the Study

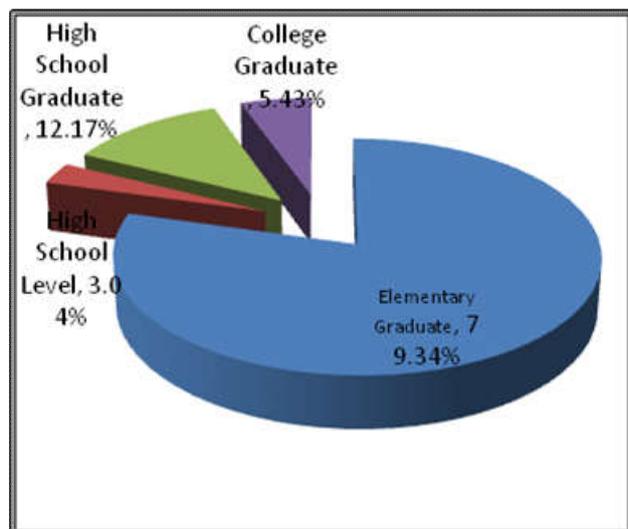


Figure 4. Education

The topics discussed were the related problems/issues, perceptions towards resources and resource use, reactions/readiness towards interpretations of JAO. The 460 respondents of study were all taken from the coastal barangays of Bucana, Polo and San Pedro, Dapitan City (57) ; Sicayab-Bucana, Gampis, Barra, Galas, Olingan and Miputak, Dipolog City(124); San Antonio Laoy, Katipunan(89), Pasil, Roxas (44), Lipras, Manukan(25) ; Tabon and Diwait, Jose Dalman (28) ; Siari, Poblacion, Lawis and Bantayan, Sindangan (57) ; Poblacion, Salug (21) and Baybay, Liloy (15) Zamboanga del Norte. These respondents were classified as fishers (86. 95%), women's group (3. 69 %), compradors/buyers/traders (1. 95%), retailers (1. 95%), processors, legislators (1. 08%), LGUs – fishery (1. 49%) and BFAR personnel (0. 43%).

RESULTS AND DISCUSSION

Respondents of the Study: Figure 3 showed that the highest percent of respondents were fishers (86. 95%). These marginalized fishers were those living near the shorelines that were most likely affected with the JAO provisions.

The retailers/ sellers (1. 95 %) comprise the wives of the fishers which imply the gender role of women as the potential source of living. The elected municipal /barangay officials (3. 91%) and BFAR personnel (0. 4348 %) were the policy implementers and monitoring group. The women group (3. 69 %) comprised the sari-sari store owners who extended credit of corn grits and canned sardines to the marginalized fishers. The compradors/ traders (1. 95%) were mostly the buyers who set the prevailing price of sardines. The processors / business sector (1. 08 %) imposed the gear, sanitation/ hygiene of packaging and transport of sardines. These groups of respondents had their own levels of comprehension and knowledge of the implementation of the ban. Christensen *et al*(2013) stressed that knowledge is crucial to carry out the provisions and the comprehension of any body of knowledge is power which calls for the responsive participatory for the marginalized people to withstand poverty. Education is an important socioeconomic factor, which has the bearing on understanding, awareness and perception of the JAO provisions. As to the educational level of the respondents, majority were elementary graduates (79. 34 %), high school

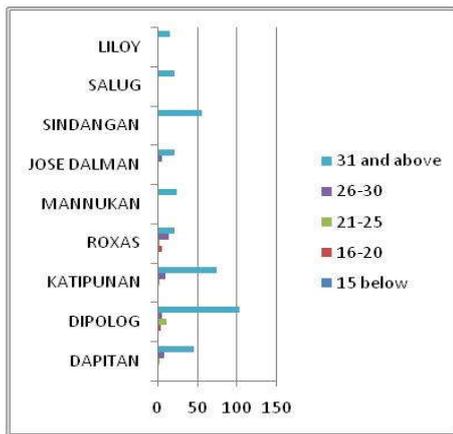


Figure 5. Age of the Respondents

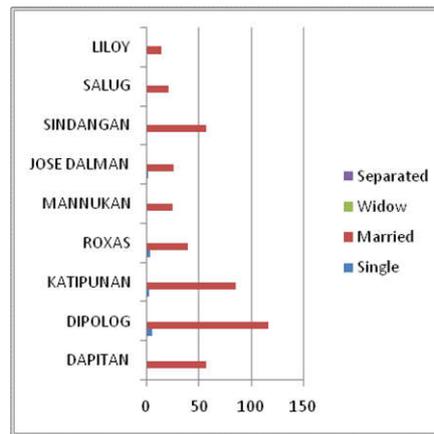


Figure 6. Status of the Respondents

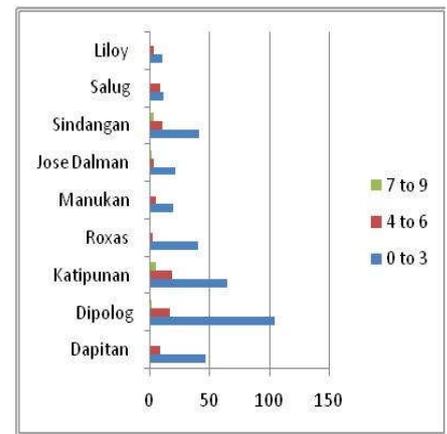


Figure 7. Number of Children



Figure 8. Fishing Grounds of Dapitan, Dipolog and Sindangan, Zamboanga del Norte

level (3.04%), high school graduates (12.17%) and some were college graduates (5.43%) (Figure 4). The education of the fishers plays a key role in the productive activities. They can be classified as literate for they belong to the middle level of education. It implies that the marginalized fishers can be beneficiaries of intervention programs on threats of overfishing and prohibited gears/commercial fishing. Age is a determinant which can be linked with cultural prejudice about what roles and needs of specific age groups might be. It can be a vital factor in determining levels of economic and social participation when it comes to targeting interventions (Habla *et al*, 2013). Majority of the respondents belong to middle age group (31- above) (88.04%), followed by the younger age group (26- 30) (9.78%), and only few belong to the early adulthood age group (25-16) (2.61%). (Figure 5). This indicates more involvement of old age and middle age group of people as fishers and fisher folks in the study area. As to the civil status, married respondents (96.52%) dominate the group and only few respondents are single (2.61%) (Figure 6). As to the number of children, majority of the respondents had

small size of family of 3 children (79.34%), some had a medium size of family of 4-6 children (17.61%) and few respondents had large size of family 7-9 children (3.04%) (Figure 7). The dominant middle age respondents would imply high condition of fertility and are still capable of large family. This reveals that the fishers and fisher folks have to sustain the livelihood of numerable counts of family members with limited resources and scarcity of opportunities. The size of the family has a direct influence of the expenditure and income patterns of the family (Habla *et al*, 2013).

Fishing operations, fishery production and income

Zamboanga del Norte is one of the top fishing grounds in Mindanao. Along the stretch of its coast subsists the main fishing grounds of the coastal communities in Murcielagos Bay, Dapitan Bay and Sindangan Bay (Figure 8). It has 27 municipalities, 13 of which are situated in the coastal zone. Commercial fishing is primarily for yellow fin tuna, while sardines are important for small-scale fishers.

Sardinellalemuru (formerly, *S. longiceps*) or the Indian oil sardine locally known as “tuloy” is an ancient common knowledge that it a small pelagic fish species in the province. The high productivity of plankton – feeding sardines are brought about by upwelling’s and/orriverine aquatic discharge (Cury *et al.*, 2000; Santos *et al.*, 2001, Naguit *et al.*, 2011). The study of Villanoy *et al.* (2010) confirmed that sardine production coincided with its coastal upwelling driven by the northeast monsoon (NEM) winds from December to February with pronounced peak from January to February. Another finding of De Guzman *et al* (2010) affirmed that in the months of December and January in the province, sardine juveniles (locally known as “lupoy”) is abundant.

In comparison with previous recorded data, the 5,030 fishermen in Dapitan City are engaging 21 fishing methods/gears. Fisheries production was 165 MT from municipal fishing and 394 MT from commercial fishing (BAS, 2011). This suggests that the reduction of Dapitan bay fishing gears is keenly monitored by the local authorities. The geographical location of Dapitan particularly in Bucana and Baylimango is relatively attribute the sardine catch abundance. The Poblacion Island is surrounded by Liboran and the Dapitan River draining towards Dapitan Bay. A large portion of swamps and marshes with belt of mangroves and sea grasses acts as the buffer zone and holds siltation. It serves as the breeding ground and nursery of juvenile marine organisms (Guillena, 2012). Dipolog bay is one of the richest fishing grounds in the province covering an area of about 24 square miles (Figure 8). The topography and moderate type four climate greatly influence the high sardine catch. Waterways of Diwan, Layawan, Katipunan Rivers, Miputak, Gusawan and Olingan creeks traverse the area. The study of Tabiliran, 2012 revealed that total fish catch during the rainy months (November 2010, December 2010 and January 2011) coincided to the low fish catch of about 7. 97 MT. Meanwhile, the dry months of February 2011, March 2011 and April 2011 coincided to the increase of herring catch with an average of 124. 6 MT. The location of Sicayab- Bucana, upwelling, and phytoplankton contributes most to the abundance of sardines. In addition, data revealed that the average fish production in commercial fishing for the last three years is 590 tons, municipal fishing accounts 312 tons and aqua-culture development 65MT(DA-BAS, 2011). There are about 18 commercial fishing operators in the city whose vessel's gross tonnage ranges from 4. 40-14. 49 tons. Likewise, the municipal fishing, 295 registered operators were having vessel tonnage range from 0. 56 to 2. 97 tons (DA- BAS, 2010). Figure 9 revealed that the fishers in Dipolog City earned a net weekly income of Php 4697. 37 during peak season and only Php604. 91 during lean months. The data is indicating a barley enough income for survival. This suggests that fishers are most likely benefited in the event of ban period. Landed catches are contributed from various gear types with widely variable catch rates (Figure 10).

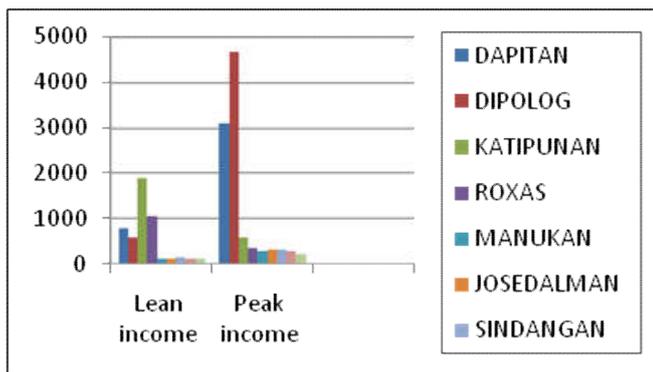


Figure 9. Net Weekly Income of Fishers During Lean and Peak Months

Figure 9 revealed that the fishers in Dapitan City earned a net weekly income of Php 3131. 75 during peak season and only Php 816. 90 during lean months. The data is indicating a moderate subsistence fishing regime. This suggests that fishers are most likely lifted from being marginalized in the event of ban period. Landed catches are contributed from various gear types with widely variable catch rates (Figure 10). Results revealed that 5 or 15% of the fishers utilized drift gill net, bottom gill net, beach seine and drag seine respectively.

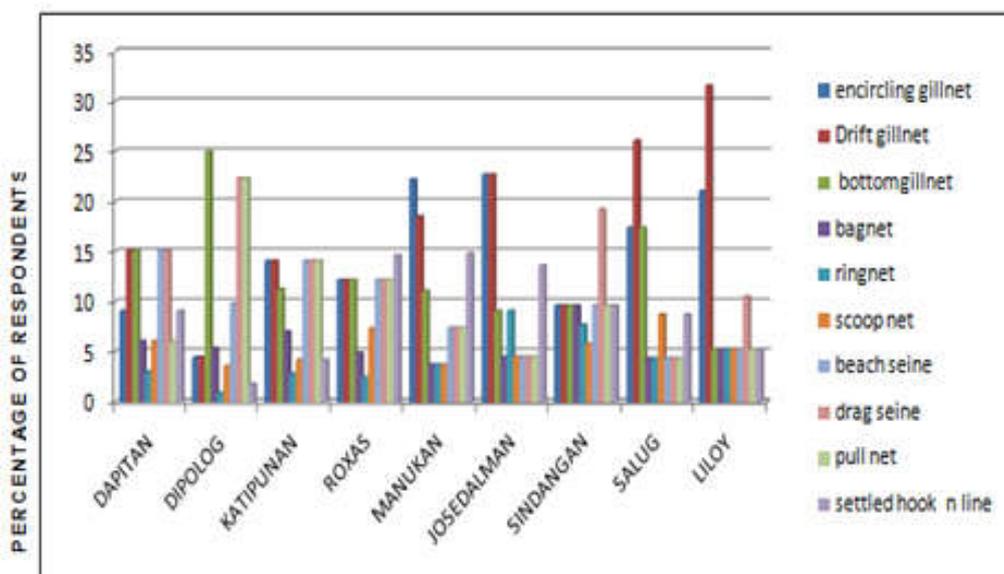


Figure 10. Gears of Fishers Operating Within the Municipal Waters

Results revealed that 28 or 25% of the fishers in Dipolog city employed the bottom gill net, 25 or 22. 32% fishers also utilized the drag seine and the pull net respectively. Majority of the fishers in the coastal barangays of Dipolog involved different types of fishing gears. Heavy fishing pressure by bagnet was also noted in Laoy. Olingan which competed with the sustenance fishers. Other major gears such as encircling gillnet, drift gillnet and drag seine recorded below 50 kg/ gear unit/trip(De Guzman *et al*, 2012). The increased demand for fish from rapidly growing population and increasing exports has substantially increased fishing pressure on the marine fishery resources in the past two decades. The major key issues facing the fisheries sector are resource depletion and environmental degradation. Current fishing methods and their catch were assessed. Commercial fishing operations in Dipolog- Sindangan bay can earn net incomes between Php 3066- Php 5323 (De Guzman *et al*, 2012). The province' upwelling fishing grounds are known for the abundant Herring and sardinella species production. The improvement and modernization of fishing gears has resulted to an increase in fish catch thus the fish sardines processing have emerged. The province produced an average of 50000 cases annually numerically equated to Php 45. 6 million (Legados, 2006). This justifies the stand as the "Bottled Spanish Sardines Capital of the Philippines" indicating for continuous supply of bottled sardines for market demands. NEDA, 2005 revealed that the 23 registered support facilities for sardines in the country, 10 areas the leading producers of sardine's products from Dipolog City. Figure 9 revealed that the fishers in Katipunan earned a net weekly income of Php 596. 91 during peak season and ironically eventually escalated to Php1901. 39 during lean months. The data is indicating a very low income which can barely sustain food. This suggests that fishers are not most likely benefited in the event of ban period. The San Sebastian processing plant for sardines located in barangay San Antonio with herring Indian specie as the fish processed has generated employment for 30 males and 20 female workers. But only few are benefited. Majority of the fishers in San Antonio, Laoy landed their catches to the processing plant at a minimal price and are rejected if the size and sanitation are not complied. During peak months, sardines are robust, oily and bigger in size. Besides, fishers are complaining of dominant predators as competitors (whales, dolphins, fish species) during peak season. The fishers' fishing trip would just be a waste of fuel and efforts for they landed a zero catch.

In Katipunan, landed catches are also provided from various gear types (Figure 10). Data revealed that 10 or 14. 08% of the fishers of Katipunan employed encircling gill net, drift gill net, beach seine, drag seine and pull net respectively while 8 or 11. 26% fishers utilized bottom gill net. Katipunan has a total of 355 fishermen with 358 fishing boats (65 motorized, 195 non-motorized (MAO, 2012). Starting with the municipality of Roxas, a fishing ban on the breeding season (October to March) (stipulated in municipal fishing ordinance) which occurs during new moon of every month is observed. During this period, fishing is prohibited for three days which starts a day before the new moon and ends one day after the new moon. Thus, with the two fishing bans (JAO and the local), the only municipality with 280 fishermen with 287 fishing boats (202 motorized and 82 non-motorized) (MAO, 2012) had experienced an annual catch of 129 MT (BAS, 2010). However as revealed in figure 9, fishers in Roxas earned a net weekly income of Php 376. 14 during peak season and

ironically eventually escalated to Php1089. 20 during lean months. The market retail price of sardines is very low. It implies a negative impact of the marginalized fishers. This suggests that fishers are not most likely benefited in the event of ban period. The problem of dominant predators as competitors (whales/ dolphins and juvenile sharks) during peak season is prevailing. As revealed in figure 10, the fishers of Roxas also employed a wide array of fishing gears. Data showed that 6 or 14. 63 % of the fishers employed settled hook and line while 5 or 12. 19% fishers used encircling gill net, bottom gillnet, beach seine, drag seine and pull net respectively. Majority of the fishers in Pasil, Roxas complained of illegal entry of commercial fishing boats and rampant illegal commercial fishing of motorized pushnet, baby beach seine, bagnet, likos likos, and kubkuban.

Manukan is another municipality which observes the peak fish breeding season (November to May)), a fishing ban which occurs during new moon of every month. Fishing is prohibited for three days which starts a day before the new moon and ends one day after the new moon. As shown in figure 9, fishers earned a net weekly income of Php 324. 40 during peak season and Php 149. 20 during lean months which simply implies that the income cannot suffice the daily household consumption. JAO and local fishing bans are not influencing factors of sardine catch production. In figure 10, data showed that 6 or 22. 22 % fishers in Manukan utilized encircling gill net, 5 or 18. 51 % fishers used drift gill net, 4 or 14. 81 % fishers used settled hook and line and 3 or 11. 11% fishers employed bottom gill net. The data confirmed as revealed by the local office that the 1,938 fishermen with 3,715 fishing boats (1 commercial, 440 motorized, and 874 non-motorized) employed fishing methods like palangre, pukot, pasol, pana, pamo, sudsod, kurantay, taga, likos, palundag, palutaw, baling baling, bobo, panggal. To date, there are identified problems still existing such as silting of rivers, presence of waste and garbage along the shoreline and mangrove areas, quarrying of sand and gravel along the coastline, illegal fishing, encroachment of out-of-town commercial fishing boats, weak law enforcement mechanism, lack of other livelihood activity during lean months, lack of support and cooperation among stakeholders, and low fish catch in recent years (MAO, 2012). Jose Dalman (formerly Ponot) is the third municipality in which the fishers observe that new moon in every month is there breeding season. This breeding season serves as the basis to their regulations on fishing ban period which disallow from fishing in three days that is a day before newmoon, newmoon and a day after newmoon. Anybody caught violating is subject to a monetary penalty of Php 1500. 00 per offense. This ordinance supplements the JAO provisions.

However in figure 9, the fishers earned a net weekly income of Php 324. 29 during peak season and Php 148. 93 during lean months. The income is not enough to sustain food for the family. Common fishing methods are the gill nets, traps, hook and lines, ring nets, trap nets, bagnet and push net for fry catching (MAO, 2012). This is confirmed in figure 10 which showed that 5 or 22. 72 % fishers in Jose Dalman employed encircling gill net and drift gill net respectively while 4 or 13. 63 % fishers used settled hook and line, 3 or 9. 09 % utilized bottom gill net and ring net respectively. Sindangan is famous for dried and brined juvenile sardines (lupoy) in the peak months of June to October. It is also during this period that many fishermen from the neighbouring municipalities and from the eastern part of Zamboanga Peninsula land their

fishing boats in the coastal barangays of Sindangan bay (MAO, 2012). As to the fisheries production an average of 9,995 Metric Tons of fish annually at 1592 kg. It is only in Sindangan where the distribution and density was recorded at 13.5 tons per catch presumably accounted to the strict enforcement of the local and JAO fishing bans. As reported in figure 9, fishers earned a net weekly income of Php 324.74 during peak season and Php 149.65 during lean months. The income is still not enough to sustain food for the family. This suggests that fishers are most likely be even more marginalized in the event of ban period. As reflected in figure 10, 19.23% or 10 of the fishers used drag seine, 5 or 9.61% of the fishers utilized encircling gill net, drift gill net, bottom gill net, bagnet, beach seine, pull net, and settled hook and line respectively. The study of De Guzman *et al.*, 2012 confirmed that fish catch recorded from bagnet (200 kg/ gear unit/ trip), a commercial fishing gear but operating within the municipal waters of Sindangan bay. Other major gears such as encircling gillnet, drift gillnet and drag seine recorded below 50 kg/ gear unit/trip. Current fishing methods and their catch were assessed. Commercial fishing operations in Dipolog-Sindangan bay can earn net incomes between Php 3066- Php 5323. Most municipal fishers, however, earn very net daily incomes indicating a highly subsistence fishing regime. Salug and Liloy municipalities are also observing that new moon in every month is there breeding season. This breeding season serves as the basis to their regulations on fishing ban period which disallow from fishing in three days that is a day before newmoon, newmoon and a day after newmoon. Anybody caught violating is subject to a monetary penalty of Php 1500.00 per offense. This ordinance supplements the JAO provisions.

However, Salug fishers earned a net weekly income of Php 323.33 during peak season and Php 146.67 during lean months (Figure 9). The income cannot sustain food for the family. As to the fisheries production, an average of 341 kg catch per day estimated average volume of catch at 531 boxes per day. The 6 or 26.08% of the fishers also employed drift gill net, 4 or 17.39% of the fishers used encircling gill net, 3 or 8.69% utilized scoop net and settled hook and line (Figure 10). In Liloy, a net weekly income during peak season earned Php 223.33 and Php 146.67 during lean months (Figure 9). The income cannot sustain food for the family. In addition, the fish market price is higher even during peak months even there is the demand of the market. Fishing season and weather are factors affecting the market price. Whole sale takes place in the barangays' landing site and fish ports while retail in the local public markets. The buyers/compradors who owned fish cars greatly influence the market price. These traders are capable of buying bigger volumes of fishing and all those quality fishing and transport it to a bigger markets (MAO, 2012). Figure 10 showed that 6 or 31.57% of the fishers in Liloy employed drift gill net, 4 or 21.05% of the fishers also used encircling gill net while 2 or 10.52% of the fishers used drag seine.

The impact of JAO towards economic conditions

Table 1 revealed that there is significant difference of impacts among the respondents' socio economic conditions. Fishers from Salug, Liloy, Katipunan, Sindangan and Roxas are becoming more marginalized in the event of the ban period. Socio economic status of fisher folks plays a key role in productive activities. Despite the high production of fish in

2010-2012, the proportion of extreme poverty among fisherfolks has largely unchanged. The province remains one of the poorest with poverty incidence of 50.3% (Reyna *et al.*, 2013). Yet, the intervention program of ban period cannot alleviate poverty.

The respondents' income during peak and lean months in terms of the knowledge of implementation of JAO ban

Table 2 revealed that there is no significant difference of respondents' income during peak and lean months inspite of their knowledge of the implementation of the ban period. The results reaffirmed that fisherfolks' income is prevailing to poverty condition. The country is famous for the rich coastal and marine resources but it is ironic that the municipal fishers earned net incomes between Php 3000- Php 300 during peak months and net income below Php 300 during lean months. Fishers are poorest among the poor during peak months taking into account that the fishers were already engaged in the said source of living for almost a decade yet still categorized as marginalized. The fish retail price is as low as P5.00 per kilo and this price cannot be compensated to the price of corn grits for a meal. Fish cars buyers set the market price. Oftentimes, the fishers catch is zero because of the dominance of predators (dolphins and other fish species). The invested fuel and efforts turned out a waste. Commercial fishing fleets were competing the municipal fishers operating within the municipal waters and were using the unregulated mesh nets.

Alternative Livelihood Among the Fishers during Lean Months

Figure 11 depicts the fishers' alternative sources of livelihood during lean months in the cities of Dipolog and Dapitan and in the municipalities of Katipunan, Roxas, Manukan, Jose Dalman, Sindangan, Salug and Liloy, Zamboanga del Norte. Results revealed that 25 or 76% of the fishers in Dapitan City engaged in carpentry, farming, driving habal habal motor vehicle, automotive and welding activities. In Dipolog City, 80 or 71% of the fishers practically engaged carpentry, welding and employed in automotive/ vulcanizing shops. Katipunan fishers, 50 or 70.42% of them are engrossed with livestock raising, weaving/ mending nets, driving, welding and automotive/ vulcanizing shops. In Roxas, 36 or 88% of the fishers are also involved in weaving / mending mesh nets, farming, livestock raising, driving habal habal motor vehicle, welding and automotive/ vulcanizing shops. Manukan fishers, 21 or 78% of them are engaged in livestock raising, weaving nets, carpentry and welding. In Jose Dalman, 13 or 59% are also engrossed with weaving/ mending nets and livestock raising. Sindangan fishers, 35 or 67% of them are engaged in welding, automotive/ vulcanizing shops, livestock raising, weaving nets, carpentry, farming and driving while 3 or 6% of the fishers are engrossed with masonry. In Salug, 16 or 70% of the fishers are engaged in weaving nets, livestock raising and carpentry. Liloy fishers, 11 or 58% are involved with weaving nets, and livestock raising while 8 or 42% are engaged in carpentry, farming, masonry, driving, automotive/ vulcanizing shops and operating a sarisari store. This means that most of the fishers have varied livelihood activities aside from fishing. They keep themselves occupied with worthwhile tasks to respond to their families' basic needs. Zamboanga del Norte is geographically blessed with diverse and rich fishing habitats in bays of Dapitan, Dipolog and Sindangan. Yet, its fishing grounds are affected by unpredictable strengths of monsoon

Table 1. Impact of JAO towards economic conditions of the respondents

Municipality	AWM	Interpretation
1.Dapitan	3.84	Highly Affected
2.Dipolog	4.10	Highly Affected
3.Katipunan	4.37	Very Highly Affected
4.Roxas	4.34	Very Highly Affected
5.Manukan	3.52	Highly Affected
6.Jose Dalman	3.36	Highly Affected
7.Sindangan	4.30	Very Highly Affected
8.Salug	4.95	Very Highly Affected
9.Liloy	4.40	Very Highly Affected
Grand Mean	4.13	Highly Affected

Variables	Mean	SD	Level of Significance	df	TV	P	Computed (t)	Action
Impact	4.0	0						
Income	11.47	16.20	0.05	9.0	1.833	0.067	2.12	Significant difference

Table 2. Respondents' income during peak and lean months in terms of the knowledge of implementation of JAO ban

Municipality	AWM	Interpretation
1.Dapitan	3.47	Agree
2.Dipolog	3.98	Agree
3.Katipunan	4.15	Agree
4.Roxas	4.02	Agree
5.Manukan	3.52	Agree
6.Jose Dalman	3.35	Undecided
7.Sindangan	4.35	Strongly Agree
8.Salug	4.0	Agree
9.Liloy	4.4	Strongly Agree
Grand Mean	3.92	Agree

Variables	Mean	SD	Level of Significance	df	TV	P	Computed (t)	Action
Knowledge	4.0	0	0.05	9.0	1.833	0.024	-2.79	Not Significant difference
Lean	5.73	6.12						
Awareness	4.0	0				0.067	-2.12	Not Significant difference
Peak	1147	1620						

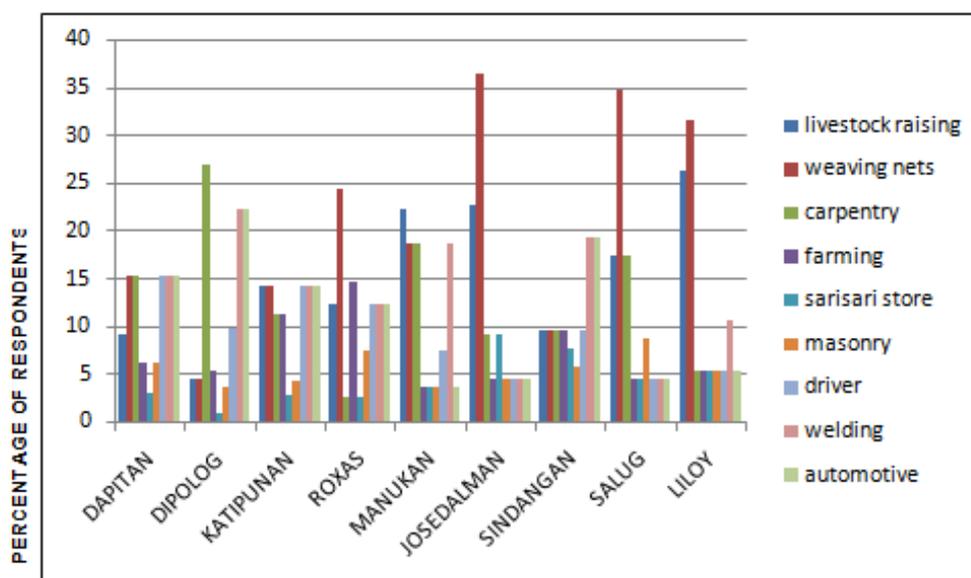


Figure11 Alternative Livelihood Among the Fishers during Lean Months

winds, overfishing and the dominance of commercial fishing, the fishers cannot rely thereby increase their vulnerability being stricken to poverty. In the previous years, majority of the fishers in the province depend on the fishing industry for their livelihood. The primary reason is the only source of living for their family. As to the number of years involved, the fishers (86. 95%) are engaged in fishing for more than a decade.

Fishers attained elementary education (79. 34%) which posed a disadvantage in the scarcity of opportunities. Poverty is inherent in the person by its character as well as intelligence (Emmanuel, 2012; Reyna *et al*, 2013). But fishers had opted and opened their minds to explore on other sourcesfor survival as their income cannot suffice their daily consumption. The study of Reyna *et al*, 2013revealed that income is compensated

to welfare. If the fishers' income would be augmented, household consumption would be realized. Based on the deliberation in the focus group discussion, they expressed for venturing backyard fishing, vermiculture, and vermicast production. Generated feedbacks had implied that trainings conducted by the government were rendered useless as they mismatched the interests of fishers. Survival and improving resilience are the keys for the fishers' adaptive capacity to hold on the poverty line despite the alternative livelihood strategies adopted by the fishing communities.

Conclusion

The fishers of Zamboanga del Norte are knowledgeable on the implementation of JAO ban. However, their weekly income is low which does not suffice their household consumption. Majority of them are until elementary education which posed a disadvantage. The recorded high production of fish is only existing in the cities of Dapitan and Dipolog. Only the traders and processors are benefited. The sardines business in the city is blooming because of the abundant supply of regulated size of sardines. The proportion of extreme poverty among fisher folks is still prevailing. Thus, implementation of JAO would have been an intervention program to increase fish production but consequently poverty in the province still exists. There must be a keen and rigorous monitoring of illegal entry of commercial fishing fleets within the municipal waters.

Livelihood projects sponsored by the government should match the interest of the fishers and there should be a group to strictly monitor the program for efficient management. The LGUs will influence and exercise fair market price of the fish.

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