

**KNOWLEDGE AND COMPLIANCE WITH FISHERY LAWS AMONG COASTAL COMMUNITIES IN CAGAYAN: A GREEN CRIMINOLOGY PERSPECTIVE**

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**ABSTRACT**

Fishing is one of the oldest forms of subsistence, relying on the abundance of aquatic resources for survival. Millions of people still rely on marine fisheries for livelihood and food even up to this date. However, due to the high demand, many fishers used illegal methods to catch faster. In northeastern Cagayan, data from the PNP Maritime Unit at Sta. Ana in Cagayan revealed that in 2021, there are 244 cases of fishery violations committed. This study assessed the level of knowledge and compliance of the fishermen with the fishery laws among the coastal communities in Cagayan, Philippines and determines whether there is a relationship between knowledge and compliance. The study uses the descriptive and correlation research design. Findings indicate that the respondents are “much knowledgeable” with the “Fishery Law particularly on unauthorized fishing, fishing with the use of explosives, electricity and poisonous substances, aquatic pollution, mangrove protection and other fishing related violations and the respondents are compliant with it. Finally, the findings also indicate that the knowledge of the respondents with the provisions of the fishery laws is positively related to their compliance. Hence, it is concluded that the knowledge of the fishermen with the fishery laws is critical in insuring the protection of the maritime and coastal resources.

**Keywords:** Fishery Law, Knowledge, Compliance, Illegal Fishing, Mangrove Protection.

**1. INTRODUCTION**

Fishing is one of the oldest forms of subsistence, relying on the abundance of aquatic resources for survival. Millions of people still rely on marine fisheries for livelihood and food even up to this date. However, due to the high demand, many fishers used illegal methods in order to catch fish faster and more profitably. Various forms of illegal fishing contribute to the depletion of fish stocks (Alvarico et al., 2021).

In 2017, the Philippines had a population of about 103 million, and mean per capita consumption of fish and fishery products of 40 kg/year or 109 grams/day with the percent of fish and fishery products intake to the total intake at 12.8%. In 2015, the fishing industry contributed 1.5% and 1.7% at current and constant prices, respectively, to the country’s gross domestic products (GDP) with the fisheries sector providing employment to over 1.6 million people, 85% of whom were from the municipal fisheries and 1% from commercial fisheries, while the aquaculture sector employed 14%. However, the state of the country’s resources in municipal waters is lightly to heavily exploited and overfished. Also, the mangrove resources have already declined, and overfishing brought about by increased number of fishers and the open access to

fisheries is common to both municipal and commercial fisheries. Commercial fishing boats continue operating in municipal waters that cause conflicts among resource users. The use of destructive fishing methods (e.g. dynamite and cyanide fishing, and the use of fine mesh net fishing gear) had contributed to the rapid decline of fish stocks and habitat degradation. Recently, issues on bycatch and discards in trawl and other fisheries have also been considered as threat to the country's fisheries sustainability (Lamarca, N. 2017)

In northeastern Cagayan alone, the data from the Philippine National Police Regional Maritime Unit 2 based at Sta. Ana in Cagayan revealed that in 2021, there are 244 cases of fishery violations committed within their territorial jurisdictions which include the coastal towns of Aparri, Buguey, Sta Teresita, Gonzaga and Sta. Ana. That according to the said office, most of the violations were committed in the town of Sta. Ana where they are situated in which they believed that there are other violators not detected and apprehended in their AOR because of their limited manpower and machineries to patrol their area.

The Cagayan mainland has a level coastline on the north opening to the South China Sea and an irregular coastline on the east facing the Philippine Sea, the country's territorial waters of the Pacific Ocean. Cagayan lies in the northeastern part of mainland Luzon, occupying the lower basin of the Cagayan River. Tuguegarao City, its capital is 483 kilometers north of Manila

Even though there are several researches on illegal fishing incidence in the country, this study focus on determining the level of knowledge of the fisher folks or fishing communities in the study setting as well as their level of compliance with the fishery laws. Knowledge plays a huge role in ensuring that community folks are compliant with the rules of the land which covers maritime and aquatic laws. To ensure sustainability of these resources, people, who rely much on the richness of these resources, must know how to protect and restore these natural resources for the consumption of the next generation. Thus, this research study was conceptualized for the said purpose.

## 2. THEORETICAL FRAMEWORK

**Social Contract Theory** - Social contract theory says that people live together in society in accordance with an agreement that establishes moral and political rules of behavior. The aim of a social contract theory is to show that members of some society have reason to endorse and comply with the fundamental social rules or laws of the society. It requires also that citizens should respect and comply with legal norms, even when they disagree with them. When their interests conflict with others' they should accept legal determinations of what their rights and duties are. Under this theory, it dictates that man must follow and obey by the laws. Failing to do so will result in legal consequences of the law i.e punishment. The application of this theory to the current study on the other hand is that laws on fishery have been enacted which will regulate the conduct of fishermen with respect to the utilization of marine resources. Violation of such warrants the imposition of punishment.

### Objectives

Generally, this study is anchored on the following objectives:

- 1) Determine the level of knowledge of the respondents with the fishery laws on the following aspect:
  - a) Unauthorized fishing or unauthorized fisheries activities

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- b) Fishing through the use of explosives, poisonous substances or electricity
  - c) Other fishing and related violations
  - d) Aquatic pollution and other similar violations
  - e) Mangrove protection
- 2) Determine the level of compliance of the respondents with the fishery laws on the following aspect;
- a) Unauthorized fishing or unauthorized fisheries activities
  - b) Fishing through the use of explosives, poisonous substances or electricity
  - c) Other fishing and related violations
  - d) Aquatic pollution and other similar violations
  - e) Mangrove protection
- 3) Is there a significant relationship between level of knowledge and level of compliance among the respondents with the fishery laws?

**Hypothesis**

This research undertaking is guided by a lone hypothesis that:

- 1) There is no significant relationship between level of knowledge and level of compliance of the respondents with the fishery laws.

**3. METHODOLOGY**

**Research Design**

The study uses the descriptive and correlation research design since it measures the level of knowledge and compliance of the respondents’ fishermen with the existing fishery laws and determine whether there is a significant relationship between the level of knowledge and compliance with the same law.

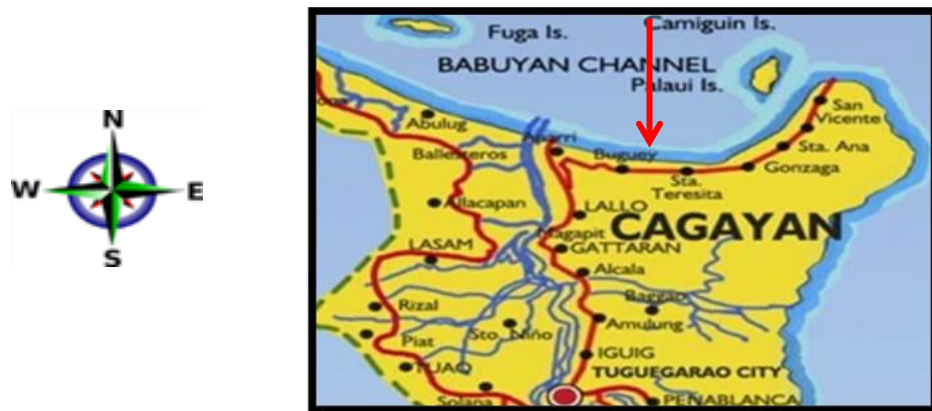
**Population and Locale of the Study**

The respondents of the study are the fisher folks in the North-eastern Municipalities of Cagayan namely Sta. Ana, Gonzaga, Sta. Teresita, Buguey and Aparri where the project of the University (Gonzaga campus) on the establishment and restoration of mangrove is located.

| Municipality | No. of Respondents | Percent |
|--------------|--------------------|---------|
| Aparri       | 103                | 22.06   |
| Buguey       | 94                 | 20.13   |
| Sta Teresita | 37                 | 7.92    |
| Gonzaga      | 141                | 30.19   |
| Sta. Ana     | 92                 | 19.70   |
| TOTAL        | 467                | 100%    |

The locale of the study are the five (5) coastal towns situated in Northeastern part of the Province of Cagayan namely Sta. Ana, Gonzaga, Sta. Teresita, Buguey and Aparri fronting the

Babuyan Channel. The Province of Cagayan is situated in the Northeastern part of Luzon adjoining Batanes Island.



**Fig. 1 Map of Cagayan Province**

**Data Gathering Tools**

The data were collected from the respondents through a survey questionnaire formulated based on Republic Act 8550 “An Act Providing for the Development, Management and Conservation of the Fisheries and Aquatic Resources and Presidential Decree No. 705 “Otherwise Known as the Forestry Reform Code Of The Philippines”, which gives protection to mangrove. For better understanding, the questionnaires were translated into local dialect to draw specific and reliable response from the respondents.

**Data Gathering Procedure**

The questionnaire were personally administered and retrieved by the researcher. For ethical grounds, personal information, responses, and data given were treated with utmost confidentiality.

**Treatment of the Data**

To interpret and analyze the level of knowledge and level of compliance of the respondents with the existing fishery laws, a four-point Likert scale was used:

| Numerical Vales | Mean Range | Verbal Interpretation                         |
|-----------------|------------|---|
| 4               | 3.26-4.00  | Very Much knowledgeable<br>Very Much Complied |
| 3               | 2.51-3.25  | Much Knowledgeable                            |

|   |           |  |                          |
|---|-----------|--|--------------------------|
|   |           |  | Much Complied            |
| 2 | 1.76-2.50 |  | Moderately Knowledgeable |
|   |           |  | Moderately Complied      |
| 1 | 1.00-1.75 |  | Not Knowledgeable        |
|   |           |  | Not Complied             |

To find out whether there is a relationship between level of knowledge and compliance of the respondents with the fishery laws, the collected data were analyzed with the use of Pearson Product-Moment Correlation, rho expressed as:

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

Where,

r = Pearson Correlation Coefficient

$x_i$  = x variable samples       $y_i$  = y variable sample

$\bar{x}$  = mean of values in x variable       $\bar{y}$  = mean of values in y variable

### 3.RESULTS AND DISCUSSION

**Table 1. Level of Knowledge and Compliance with Environmental Laws and Ord Unauthorized Fishing or Engaging in Other Unauthorized Fisheries Activities**

| a) Unauthorized Fishing or Engaging in Other Unauthorized Fisheries Activities   | Knowledge |    | Compliance |    |
|--|-----------|----|------------|----|
|  | Mean      | DI | Mean       | DI |
| Exploitation or occupying Philippine waters without a license, lease or permit is unlawful.                                      | 2.94      | MK | 3.01       | MC |
| Produce, breed, culture, fish, fry or fingerlings of any fishery species or fishery products without a license, lease or permit. | 2.82      | MK | 3.04       | MC |

|   |             |           |             |           |
|---|-------------|-----------|-------------|-----------|
| Capture or gather fish, fry or fingerlings of any fishery species or fishery products without a license, lease or permit.   | 2.85        | MK        | 3.09        | MC        |
| Engage in any fishery activity in Philippine waters without a license, lease or permit.   | 3.01        | MK        | 3.13        | MC        |
| The discovery of any person in an area where he has no permit or registration papers for a fishing vessel shall constitute a prima facie presumption that the person and/or vessel is engaged in unauthorized fishing and he has the responsibility to report such to proper authorities. | 3.10        | MK        | 3.15        | MC        |
| It is unlawful for any person not listed in the registry of municipal fisher folk to engage in any commercial fishing activity in municipal waters.   | 3.10        | MK        | 3.19        | MC        |
| <b>Category Mean</b>  | <b>2.97</b> | <b>MK</b> | <b>3.10</b> | <b>MC</b> |

**Legend: MK- Much Knowledgeable      MC- Much Complied**

As gleaned from table 1 an item mean of 3.10 indicates that the respondents are “much knowledgeable” with the provision that it is unlawful to engage in commercial fishing if not registered in the registry of municipal fisher folk. The respondents are also knowledgeable that the presence of a person or fishing vessel in fishing areas and which are not registered can be interpreted as a form of illegal fishing. An item mean of 2.82 though being the lowest indicates that the respondents are “much knowledgeable” with the rule that it is prohibited to produce, breed, culture, fish, fry or fingerlings of any fishery species or fishery products without a license, lease or permit. The findings indicates that the respondents fishermen are knowledgeable with their responsibility to register before their respective LGU’s when they engage in commercial fishing activities and whenever they engage in business of producing, breeding and or culture fish, fry or fingerlings. This is due to the fact that there is information campaign of the DA-BFAR with respect to the services and support systems offered by the agency for individuals/group of individual engage in fishing business/industry particularly registered fisher folk association in their respective jurisdiction.

An overall mean of 2.97 indicates that the respondents knows that any form of fishing and/fishery activities without permit, lease or agreement is prohibited. This indicates that most of the respondents recognize their responsibility to register first or possess the necessary documents before engaging in fishing activities. This further indicates that the LGU’s particularly the DA-BFAR insures that all individuals engage in fishing/fishery business must be registered. On compliance, it is noted that the respondents “much complied” the provision of the fishery law on the importance of having the necessary permit, lease or agreement prior to engaging in fishery

business/activity as supported by a category mean of 3.10. This further indicates that most of the respondents possesses the required documents or authority. This further indicates that the DA-BFAR are strict in the implementation of the fishery law particularly on regulatory compliance. Moreover, the respondents are encouraged to register before the DA-BFAR since their registration serves as the basis of the agency in providing support systems.

This findings is supported by the findings of Catedrilla et al., 2012 that fishers' reasons for compliance and non-compliance of fisheries laws by Coastal Resources Management program implementers is essential in planning for their effective dissemination and implementation and in increasing participation of stakeholders in the management of a particular resource. Moreover, awareness of cases of violations of the fisheries laws as well as apprehensions among the fishers also increases their consciousness about the fisheries laws and therefore is critical in improving compliance levels among them. Moreover, to improve regulatory control over illegal, unreported and unregulated (IUU) fishing authorities need to acquire more efficient management techniques and enforcement tools to control fishing capacity and refine incompatible legal frameworks (Kawamura and Siriraksophon, 2014).

**Table 2. Respondents' Level of Knowledge and Compliance with the Fishery Laws on Fishing Through Explosives, Noxious or Poisonous Substance, and/or Electricity**

| b) Fishing Through Explosives, Noxious or Poisonous Substance, and/or Electricity  | Knowledge |     | Compliance |     |
|--|-----------|-----|------------|-----|
|  | Mean      | DI  | Mean       | DI  |
| It is unlawful for any person to catch, take or gather or cause to be caught, taken or gathered, fish or any fishery species in Philippine waters with the use of electricity.                 | 3.28      | VMK | 3.31       | VMC |
| It is unlawful for any person to catch, take or gather or cause to be caught, taken or gathered, fish or any fishery species in Philippine waters with the use of explosives or dynamite.      | 3.28      | VMK | 3.32       | VMC |
| It unlawful for any person to catch, take or gather or cause to be caught, taken or gathered, fish or any fishery species in Philippine waters with the use of noxious or poisonous substance. | 3.13      | MK  | 3.32       | VMC |
| Possessing, dealing in, sell or in any manner dispose of, any fish or fishery species which have been illegally caught, taken or gathered is punishable.                                       | 3.22      | MK  | 3.22       | MC  |
| It is unlawful to possess, deal in, sell or in any manner dispose of, any fish or fishery species which have been illegally caught, taken or gathered.   | 3.13      | MK  | 3.23       | MC  |



|   |             |           |             |            |
|---|-------------|-----------|-------------|------------|
| Report the discovery of dynamite, other explosives and chemical compounds which contain combustible elements, or noxious or poisonous substances, or equipment or device for electro-fishing in any fishing vessel or in the possession of any fisherfolk, operator, fishing boat official or fishworker shall constitute that the same was used for fishing to appropriate authorities | 3.21        | MK        | 3.23        | MC         |
| Report the discovery in any fishing vessel of fish caught or killed with the use of explosive, noxious or poisonous substances or by electricity shall constitute that the fisherfolk, operator, boat official or fishworker is fishing with the use thereof to appropriate authorities   | 3.20        | MK        | 3.24        | MC         |
| <b>Category Mean</b>  | <b>3.21</b> | <b>MK</b> | <b>3.27</b> | <b>VMC</b> |

**Legend: MK- Much Knowledgeable                      VMK- Very Much Knowledgeable**  
**MC- Much Complied                                      VMC- Very Much Complied**

Table 2 shows that the item mean of 3.28 means “very much knowledgeable” indicates that the respondents are very conversant with the law that it is prohibited to catch or gather fish or any fishery species in Philippine waters with the use of electricity and explosive. The data also suggests that the respondents fully comply with this provision of the fishery law this further indicates that the fishermen do not engage in fishing through the use of electricity or explosives as supported by an item mean of 3.21 and 3.22 respectively. An item mean of 3.13, 3.22, 3.21 and 3.20 indicates that the respondents are ‘much knowledgeable’ that fishing with the use of chemicals as well as possessing, selling and/or disposing fish of any kind caught in illegal manner is prohibited. Finally, a category mean of 3.21 means ‘much knowledgeable’ indicates that the respondents are aware and conversant with the rule on illegal fishing through the use of electricity and explosives as well as related violation i.e sale, possession or fish of any kind which are caught in an illegal way.

Finally, a category mean of 3.27 means ‘very much complied’ indicates that the respondents fully comply with the provision of the law on illegal fishing via use of electricity and explosives as well as acts related to it like possessing, selling dealing or disposing fishes caught in violation of the law. This further means that the respondents tend to obey the law and would protect marine resources to ensure sustainability of fish catch. This is evident through the organization and mobilization of the local fisher folk associations in guarding marine resources particularly Marine Protected Areas (MPAs) established. This also further shows that the DA-BFAR and the Maritime Police are strict in the enforcement of this provision of the fishery law beside from mobilizing and enlisting the help of local fishermen in guarding marine resources.

This finding is reinforced by Davis et. al. 2020 who mentioned that fisheries management problems are “collective action problems” requiring the cooperation of many different actors to solve. The importance of having a shared understanding, between stakeholders of greatly varying size and expertise, must be recognized and fishery regulations should be interpreted within the



context of local mechanisms of social control, market relations, reciprocity and cooperation (Davis & Hanich, 2020) (Davydov, 2014).

**Table 3. Respondents’ Level of Knowledge and Compliance with the Fishery Law on Other Fishing and Related Violations**

| c) Other Fishing and Related Violations  | Knowledge |    | Compliance |    |
|--|-----------|----|------------|----|
|  | Mean      | DI | Mean       | DI |
| It is unlawful to engage in fishing using fine mesh nets unless the same shall be used to gather species which by their nature are small but already mature.   | 3.07      | MK | 3.10       | MC |
| It is unlawful to engage in fishing in municipal waters and in all bays as well as other fishery management areas using active fishing gears   | 3.13      | MK | 3.10       | MC |
| It is unlawful to engage in fishing with the use of superlights in municipal waters  | 3.05      | MK | 3.06       | MC |
| It is unlawful for any person or corporation to gather, possess, sell or export ordinary precious and semi-precious corals, whether raw or in processed form   | 3.14      | MK | 3.17       | MC |
| It shall be unlawful for any person, natural or juridical, to fish with gear method such as Muro-Ami or any of its variation that destroy coral reefs, seagrass beds, and other fishery marine life habitat. | 3.17      | MK | 3.21       | MC |
| It is unlawful to fish in overfished area and during closed season   | 3.05      | MK | 3.12       | MC |
| It is unlawful for any person to gather, sell or export white sand, silica, pebbles and other substances which make up any marine habitat.   | 3.20      | MK | 3.22       | MC |
| It is unlawful to fish in marine protected areas, fishery reserves, refuge, or fish sanctuaries as declared by the Department of Agriculture or the LGUs.  | 3.23      | MK | 3.23       | MC |
| It is unlawful to fish or take rare, threatened or endangered species  | 3.16      | MK | 3.20       | MC |

|   |             |           |             |           |
|---|-------------|-----------|-------------|-----------|
| It is unlawful for any person to catch, gather, capture or possess mature milkfish or "sabalo" and such other breeders or spawners of other fishery species | 3.12        | MK        | 3.22        | MC        |
| The exportation of breeders, spawners, eggs or fry is likewise prohibited   | 3.12        | MK        | 3.20        | MC        |
| It is unlawful for any person to fish in violation of catch ceilings  | 3.01        | MK        | 3.06        | MC        |
| <b>Category Mean</b>  | <b>3.12</b> | <b>MK</b> | <b>3.16</b> | <b>MC</b> |

**Legend: MK- Much Knowledgeable      MC- Much Complied**

As shown from the table, an item mean of 3.23 being the highest means “much knowledgeable” shows that the respondents are conversant that that it is unlawful to fish in marine protected areas, fishery reserves, refuge, or fish sanctuaries as declared by the Department of Agriculture or the LGUs. Moreover, the respondents are compliant with the same provision of the law as supported by an item mean of 3.23 meaning “much complied”. This further indicates that the DA-BFAR or the LGUs are very particular in the protection of marine protected areas (MPAs) and fishery reserves areas.

An item mean of 3.01 being the lowest though still interpreted as “much knowledgeable” indicates that the respondents are familiar on the policy that it is prohibited to catch which is beyond the catch ceiling from any fishing area in consideration of the need to prevent overfishing. A category mean of 3.12 means “much knowledgeable” indicates that the respondents have a considerable level of knowledge over fishing using fine mesh nets, using active fishing gears, fishing with the use of superlights in municipal waters, to gather, possess, sell or export ordinary precious and semi-precious corals, whether raw or in processed form, , to fish with gear method such as Muro-Ami or any of its variation that destroy coral reefs, seagrass beds, and other fishery marine life habitat, to fish in overfished area and during closed season and to fish or take rare, threatened or endangered species. The respondents also comply all the above-mentioned prohibited acts as supported by a category mean of 3.16 means “much complied”. This further manifest that the respondents are familiar with the above mentioned provisions of the “Anti-Illegal Fishing Law” and they are compliant on it.

**Table 4. Respondents' Level of Knowledge and Compliance with Fishery Laws on Aquatic Pollution & other Related Violation**

| Aquatic Pollution and other Related Violations   | Knowledge   |           | Compliance  |            |
|--|-------------|-----------|-------------|------------|
|  | Mean        | DI        | Mean        | DI         |
| Dumping/disposal of waste and other marine litters to the aquatic environment is prohibited  | 3.27        | VMK       | 3.30        | VMC        |
| Discharge of petroleum or residual products of petroleum Of carbonaceous materials/substances is unlawful  | 3.38        | VMK       | 3.35        | VMC        |
| Discharge of radioactive or harmful liquid, gaseous or solid substances, from any water, land or air transport or other human-made structure shall likewise unlawful   | 3.28        | VMK       | 3.32        | VMC        |
| Engaging in unsound agricultural practices such as the use of banned chemicals and excessive use of chemicals, intensive use of artificial fish feed, and wetland conversion, which causes similar hazards and deleterious effects   | 3.24        | VMK       | 3.27        | VMC        |
| Introduction of substances or energy to the aquatic environment which result in such deleterious effects as to harm living and non-living aquatic resources, pose potential and/or real hazard to human health                       | 3.22        | MK        | 3.28        | VMC        |
| It is unlawful for any person to take, sell, transfer, or have in possession for any purpose any shell fish which is sexually mature or below the minimum size or above the maximum quantities prescribed for the particular species | 3.11        | MK        | 3.24        | MC         |
| It is unlawful to construct and operate fish corrals/traps, fish pens, and fish cages without a license/permit.  | 3.12        | MK        | 3.21        | MC         |
| <b>Category Mean</b>   | <b>3.23</b> | <b>MK</b> | <b>3.28</b> | <b>VMC</b> |

**Legend: MK- Much Knowledgeable**  
**MC- Much Complied**

**VMK-Very Much Knowledgeable**  
**VMC- Very Much Complied**

As gleaned from the table an item mean of 3.38, 3.28, 3.27 and 3.24 means “very much knowledgeable” indicate that the respondents are fully aware with the prohibitions on discharging petroleum products, harmful liquid as well as dumping of waste and other marine litters and the use of banned chemicals for fishing respectively. The data also shows that the respondents are fully compliant with the mentioned provisions of the law.

A category mean of 3.23 means “much knowledgeable” suggest that the respondents are aware with the law that it is prohibited to engage in any form of aquatic pollution and other related violations. The respondents are fully compliant with this provision of the Fishery Code as supported by a category mean of 3.28 means “very much complied”. This further suggests that the DA-BFAR and the LGUs within the study setting are strict in protecting the sea against any form of aquatic pollution. This is manifested by clean coastal waters within the study area which extends from Aparri up to the Extreme Eastern portion of the coastline - Sta. Ana.

**Table 5. Respondents’ Level of Knowledge and Compliance with Fishery Law on Mangrove Protection**

| d) Provisions on Mangrove Protection (RA 8550, PD 705)   | Knowledge |     | Compliance |     |
|--|-----------|-----|------------|-----|
|  | Mean      | DI  | Mean       | DI  |
| It is unlawful for any person to convert mangroves into fishponds or for any other purposes  | 3.06      | MK  | 3.12       | MC  |
| The act of making kaingin for one’s own private use or for others any mangrove forest without authority is prohibited.                               | 3.19      | MK  | 3.21       | MC  |
| That cutting any mangrove species is prohibited  | 3.20      | MK  | 3.23       | MC  |
| The act of gathering and/or collecting any species of mangrove trees or other forest growth found therein without license is prohibited.             | 3.27      | VMK | 3.30       | VMC |
| The act of destroying in any manner such mangrove forest or any part thereof, or causes any damage to the forest growth found therein is prohibited. | 3.23      | MK  | 3.37       | VMC |
| Category Mean  | 3.19      | MK  | 3.25       | MC  |

**Legend: MK- Much Knowledgeable  
MC- Much Complied**

**VMK-Very Much Knowledgeable  
VMC- Very Much Complied**

As gleaned from table 5 an item mean of 3.27 means “very much knowledgeable” indicates that the respondents are fully aware that it is prohibited to gather/collect any species of mangrove trees or other forest growth in mangrove areas. The respondents also fully comply with this provision of the law as supported by a mean of 3.37 means “very much complied”. This further means that no respondents are engage in cutting mangrove trees within the study setting.

An item mean of 3.06 being the lowest though still interpreted as “much knowledgeable” indicates that the respondents are aware that it is unlawful to convert mangroves areas into fishponds or for any other purposes. This indicates that the respondents are prevented from doing so and they comply this provision of the law as supported by an item mean of 3.12 means “much complied”.

A category mean of 3.19 means “much knowledgeable” shows that the respondents are aware with the provisions of the Fishery Law on mangrove protection like conversion, kaingin, cutting or gathering or any acts which destroy the mangrove areas. The data also suggests that the respondents are compliant on it as supported by a mean of 3.25 means “much complied”.

**Table 6: Summary of Result on the Level of Knowledge and Compliance on the Fishery Law**

| Area   | Knowledge   |           | Compliance  |            |
|--|-------------|-----------|-------------|------------|
|  | Mean        | DI        | Mean        | DI         |
| Unauthorized Fishing or Engaging in Other Unauthorized Fisheries Activities    | 2.97        | MK        | 3.10        | MC         |
| Fishing Through Explosives, Noxious or Poisonous Substance, and/or Electricity | 3.21        | MK        | 3.10        | MC         |
| Other Fishing and Related Violations   | 3.12        | MK        | 3.16        | MC         |
| Aquatic Pollution and other Related Violations                                 | 3.23        | MK        | 3.28        | VMC        |
| Provisions on Mangrove Protection (RA 8550, PD 705)                            | 3.19        | MK        | 3.26        | VMC        |
| <b>OVER-ALL MEAN</b>   | <b>3.14</b> | <b>MK</b> | <b>3.26</b> | <b>VMC</b> |

**Legend: MK- Much Knowledgeable**

**MC- Much Complied**

**VMC- Very Much Complied**

As shown from the table, an over-all mean of 3.14 means “much knowledgeable” suggest that the respondents are familiar with the provisions of the “Fishery Law” like unauthorized fishing, fishing with the use of explosives, electricity and poisonous substances, aquatic pollution, mangrove protection and other fishing related violation such as fishing during closed season, catch ceiling, fishing on MPAs among others. However, the data indicates that the respondents are “not fully knowledgeable” with the provision of the “Fishery Law”.

A category mean of 3.28 and 3.26 means “very much complied” shows that the respondents fully complied the prohibition on aquatic pollution and protection of mangrove respectively. The category mean of 3.10 and 3.16 means “much complied” shows that the respondents comply with the provisions on authorized fishing, fishing through the use of explosives, electricity and other fishing related violation such overfishing, catch ceiling and closed season fishing, use of superlight and fishing on marine protected areas and fishery reserves. The data however suggests that the respondents are “not fully” compliant with this particular provisions of the law. Meaning, there are still violators of this provisions of the fishery law. However, in general the data suggest that the respondents “very much complied” the provision of the “Fishery Law” as supported by an over-all mean of 3.26 means “very much complied”.

**Table 7. Pearson rho Analysis of Relationship Between Knowledge Level and Compliance Level with Fishery Laws**

| Components of the Fisheries Code | Knowledge     | Compliance    | Pearson Correlation, rho | t computed  | t tabular    | Decision         | Conclusion                      |
|----------------------------------|---------------|---------------|--------------------------|-------------|--------------|------------------|---------------------------------|
|                                  | Weighted Mean | Weighted Mean |                          |             |              |                  |                                 |
| <b>A</b>                         | 2.97          | 3.10          | 0.88                     | 39.8        | 1.960        | Reject Ho        | Significant Relationship        |
| <b>B</b>                         | 3.21          | 3.10          | 0.83                     | 32.0        | 1.960        | Reject Ho        | Significant Relationship        |
| <b>C</b>                         | 3.12          | 3.16          | 0.89                     | 41.9        | 1.960        | Reject Ho        | Significant Relationship        |
| <b>D</b>                         | 3.23          | 3.28          | 0.90                     | 44.3        | 1.960        | Reject Ho        | Significant Relationship        |
| <b>E</b>                         | 3.19          | 3.26          | 0.80                     | 28.6        | 1.960        | Reject Ho        | Significant Relationship        |
| <b>Grand Mean</b>                | <b>3.14</b>   | <b>3.26</b>   | <b>0.911</b>             | <b>47.4</b> | <b>1.960</b> | <b>Reject Ho</b> | <b>Significant Relationship</b> |



In item A of RA 8550, Unauthorized Fishing or Engaging in other Unauthorized Fisheries Activities, the knowledge of the respondents is positively related to their compliance with a pearson correlation of  $r=.88$ . The T-test of significance revealed that the correlation is significant at  $t=.05$  level. The t computed value is 39.8 which is higher than the tabular value of 1.960, therefor the null hypothesis is rejected. This means that the level of knowledge of the respondents with the provisions on unauthorized fishing and other unauthorized fisheries activities is related with their level of compliance and the relationship is said to be significant. This further means that the higher the level of knowledge of the respondents on the unauthorized fishing and other unauthorized fisheries activities the higher the level of their compliance.

In item B of RA 8550, Fishing through Explosives, Noxious or Poisonous Substance, and/or Electricity, the knowledge of the respondents is positively related to their compliance with a pearson correlation of  $r=.83$  . The t-test of significance revealed that the correlation is significant at  $t=.05$  level. The t computed value is 32.0 which is higher than the tabular value of 1.960, therefor the null hypothesis is rejected. This means that the level of knowledge of the respondents with the provisions on “fishing through explosives, poisonous substance or electricity is related with their level of compliance and the relationship is said to be significant. This further means that the higher the level of knowledge of the respondents on the provisions on fishing through explosives, poisonous substances and or electricity the higher the level of their compliance.

In item (C) on the provisions of Other Fishing and other Related Violations i.e fishing using fine mesh nets, use of superlights, fishing in marine protected areas (MPA), overfishing, and fishing during closed season, the knowledge of the respondents is positively related to their compliance with a pearson correlation of  $r=0.89$  . The t-test of significance revealed that the correlation is significant at  $t=.05$  level. The t computed value is 41.9 which is higher than the tabular value of 1.960, therefor the null hypothesis is rejected. This means that the level of knowledge of the respondents with these particular provisions of RA 8550 is related with their level of compliance and the relationship is said to be significant. This further means that the higher the level of knowledge of the respondents on this provisions the higher the level of their compliance also.

In item (D) on the provisions of Aquatic Pollution and other Related Violations, the knowledge of the respondents is positively related to their compliance with a pearson correlation of  $r=0.90$  . The t-test of significance revealed that the correlation is significant at  $t=.05$  level. The t computed value is 44.3 which is higher than the tabular value of 1.960, therefor the null hypothesis is rejected. This means that the level of knowledge of the respondents with these particular provisions of RA 8550 is related with their level of compliance and the relationship is said to be significant. This further means that the higher the level of knowledge of the respondents on this provisions the higher the level of their compliance also.

In item (E) on mangrove protection, the knowledge of the respondents is positively related to their compliance with a pearson correlation of  $r=0.80$  . The t-test of significance revealed that the correlation is significant at  $t=.05$  level. The t computed value is 28.6 which is higher than the tabular value of 1.960, therefor the null hypothesis is rejected. This means that the level of knowledge of the respondents with these particular provisions of RA 8550 is related with their level of compliance and the relationship is said to be significant. This further means that the higher the level of knowledge of the respondents on this provisions the higher the level

of their compliance also.

As a whole, the knowledge of the respondents with the provisions of the fishery laws is positively related to their compliance with a Pearson correlation of  $r=0.911$ . The t-test of significance revealed that the correlation is significant at  $t=0.05$  level. The t computed value is 47.4 which is higher than the tabular of 1.960, therefore the null hypothesis is rejected. This means that the level of knowledge of the respondents with the provisions of the fishery code is related with their level of compliance as well and the relationship is said to be significant. This further means that the higher the level of knowledge of the respondents the higher the level of their compliance also.

The findings is supported by (Catedrilla et al., 2012) that the awareness of cases of violations of the fisheries laws as well as apprehensions among the fishers also increases their consciousness about the fisheries laws and therefore is critical in improving compliance levels among fishermen. However, increased enforcement resources may be justified to ensure also for a continued compliance benefits (Porter et al., 2013). On the other hand, fishers' awareness of current policies, fishers' attitudes concerning different aspects of fisheries regulation, and fishers' suggestions on how their fisheries should be managed serves as key for working cooperatively towards the design of management strategies that provide better stimulus for resource stewardship and discourage overfishing (Cinti et al., 2010). The lack of awareness regarding fishery regulations as one of the major limitations in the implementation of CRM (Islam et al., 2017)

#### **4.RECOMMENDATIONS**

Based on the findings, it is recommended that:

1. The Local Government Units particularly the Bureau of Fisheries and Aquatic Resources (BFAR) shall insure that all fishermen are registered and shall encouraged them to established and or join to the existing "Fisher folk Associations" to ensure the speedy delivery of basic services and support and to facilitate monitoring of the "Fisher folk Activities.
2. The LGU and or BFAR shall encouraged the organization of Bantay Dagat from among the Fisher folk Association to patrol Marine Protected Areas (MPAs), fishery reserves, fish sanctuaries and provide support mechanism to those already organized to strengthen their capability in insuring the protection of marine resources.
3. The PNP Maritime Unit and the BFAR shall continuously conducts law enforcement activities, which include port control assistance, monitoring on fish landing areas and seaborne patrol operations among others.
4. The Cagayan State University in collaboration with the Bureau of Fisheries and Aquatic Resources (BFAR) shall continue the conduct of education and extends support to fisher folks.
5. Study of the same kind shall be conducted considering the social forces or factors that affect knowledge and compliance or non-compliance with the fishery laws.

**5.CONCLUSION**

Based from the findings, it is concluded that the knowledge of the fishermen with the existing fishery laws is very critical in insuring the protection of the maritime and coastal resources against human threat i.e illegal fishing activities, overfishing and destruction of mangrove areas. It is further concluded that the empowerment of fisher folk like creation or establishment of fisher folk association and local fisher folk to police maritime resources is very vital in as much as coastal resources management and maritime protection is concerned.

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