

Multifaceted Contributory Causes, Policy Implementation and Community Initiatives on Illegal Fishing in Romblon Province, Philippines: Basis for an Intervention Program

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Abstract. Environmental crimes are one of the fastest growing crimes which affect the entire planet. This are vastly expanding and increasingly endangering not only wildlife populations but the entire ecosystems, sustainable livelihoods, and revenue streams to governments. Descriptive design was used to assess the thoughts and perceptions of the research participants, which enabled the development of an understanding to the Multifaceted Contributory Causes, Enforcement Policies and Community Initiatives on Illegal Fishing in Romblon Philippines. This study examined the social, economic, and political causes of illegal fishing and evaluated policy enforcement and community initiatives. Findings revealed that social factors particularly limited knowledge of fisheries regulations, lack of livelihood alternatives, weak community law enforcement linkages, and social acceptance of illicit practices were the most influential drivers. On the other hand, in policy enforcement, detection and deterrence were rated highly effective, while response received the lowest rating, indicating challenges in operational readiness and timely action. Meanwhile, community initiatives were strongest in monitoring and governance but weaker in engagement, which emphasize that community does not engagement much with the law enforcement in dealing with illegal fishing. Significant differences were found between fishermen and law enforcement personnel in their perceptions of the causes of illegal fishing and aspects of enforcement, particularly detection. Correlation analysis showed significant relationships between the identified causes and enforcement components. Based on these results, an intervention program was developed to strengthen enforcement and community participation. Significant relationship between the components of enforcement and the identified causes were shown by correlation analysis. An intervention program was created to improve community involvement and enforcement in light of these findings.

Introduction

Environmental crimes are one of the fastest growing crimes which affect the entire planet. This are vastly expanding and increasingly endangering not only wildlife populations but the entire ecosystems, sustainable livelihoods, and revenue streams to governments (Sharma, 2025). According to the Federal Bureau of Investigation, environmental crime is a broad category of offenses, it affects the entire world ecosystem, from deforestation to destructive mining, from illegal waste dumping to illegal fishing, all of this mention illegal activities against the environment, the sea water were incredibly affected for it serve as the catch basin of all the waste in the dry land.

Since, ocean and sea areas covered the 71% of the earth and the economic reliance of many communities on marine resources; illegal, unreported, and unregulated (IUU) fishing is a global problem, especially in developing coastal countries (World Ocean Review, 2021). It is an environmental crime that increases overfishing, harms marine ecosystems, and jeopardizes food security, biodiversity, and the sustainability of fisheries. Roughly 20% of fish that are taken in the wild are thought to come from illegal fishing operations (IUUs), which generate approximately USD 36.4 billion in illicit profits each year. This represents significant losses to the legal fishing industry. IUU fishing is constantly acknowledged by academics

and organizations as a transnational issue with criminological, ecological, and economic ramifications that call for more stringent regulation and enforcement (Temple et al., 2022; WWF, n.d.; NOAA, n.d.; Fiore & Horn; Global Financial Integrity, 2023).

In the Philippines, illegal fishing was a type of environmental crime which is very common. Several illegal fishing practices continuously bombarded the coastal ecosystem of the nation. In addition, several fishing methods harm and destroy the marine ecosystem and aquatic life. Since the Philippine is surrounded by a bodies of water, and from its natural archipelagic location, it cannot be denied that the country are rich in different varieties of fish, which now is being depleted as to the ongoing different illegal, unregulated and unreported fishing in the country.

Illegal fishing practices damage marine ecosystems and jeopardize the long-term viability of fisheries, especially when they destroy seabeds and coral reefs. Fishing-dependent families experience growing poverty as a result of these activities, which also result in diminishing fish stocks and decreased production. Significant output declines are already evident in national data, such as a -6.5% shift in fisheries production between 2024 and 2025 (Philippine Statistics Authority, 2025). According to reports, illicit activities that destroy habitats are causing the Philippine fisheries to drastically decline (One Ocean Org, 2022). According to Environmental Security Theory, if unsustainable exploitation persists, this environmental deterioration directly jeopardizes human, economic, and national security, endangering future generations (Read, 2024).

The occurrence of illegal fishing was not just happen for an instance, instead it was deeply rooted and explained with several theoretical implication. As explained by Rational Choice Theory, wherein, every individual like fishermen weighed the perceive benefits of their illegal fishing activity. According to rational choice theory, people make actions base on the cost-benefit analysis (Sondej, n.d). With that, if fisher-folk perceived that there were more benefits than the cost of indulging in illegal fishing practice, then they were more likely to engage in such illegal practice.

In addition, an assumed weak enforcement and the lack of preventive measure including punishment highly encourage illegal fishing activities. According to Bourassa (2021), deterrence theory is a concept in criminology that explores the role of punishment and preventive measure for future criminal behavior. Deterrence theory explained that, the lack of consistent law enforcement activities, encourage illegal and criminal behavior. In view of illegal fishing, the inconsistent law enforcement, to include the absence of seaborne patrol and monitoring, gave an opportunity for the occurrence of illegal fishing. These activity highly deter illegal activities, including illegal fishing.

In Romblon, illegal fishing is still a major issue; numerous occurrences have been documented in recent years. As part of illegal fishing operation accomplishment from 2018 to 2025, several large fishing vessels and people involved in illicit activities have been apprehended as a result of joint operations between the Philippine Coast Guard and the Banton Municipal Police Station. Examples of these operations include the 2020 seaborne patrol near La Carlota Island and the 2021 arrests in Cajidiocan. From 2018 to 2020, there were multiple arrests for IUU fishing a provided by provincial and local police data. Law enforcement operations lasted as late as February 2025. Lastly, on January 27, 2026, while Romblon MARPSTA Odiongan MLET conducted a seaborne patrol along the municipal seawaters of San Agustin at Calatrava, Romblon. In line with this, authorizes seized three fishing vessels for using active gear in violation of Section 95 of RA 10654, there were estimated 2.7 million valued of confiscated items including boats, engines, fishing nets, and fish. However, these show persistent unlawful fishing despite continual enforcement efforts, underscoring the province's need for more robust and continuing interventions. Yet, there were no exact empirical data of illegal fishing in the province of Romblon.

In addition, there is a lack of comprehensive research documenting the lived experiences, multifaceted contributory causes, and community initiatives related to effective law enforcement and the challenges of enforcement in Romblon. Understanding these factors is crucial for identifying the root causes of illegal fishing practices and examining community responses, particularly regarding their participation in regulating illegal fishing and supporting preventive measures. According to Terry and Donato (2024), there is an imperative need for developing a comprehensive and effective strategy to curb illegal fishing, emphasizing the importance of collaborative efforts and a coordinated approach between law enforcement agencies and local communities. Furthermore, there is limited data on enforcement mechanisms within the specific geographic context of the province. Therefore, it is vital to know the status of implementation to improve their program and policy. In this regard, PEMSEA (2018) noted that programs often fail to address fundamental problems such as interagency silos and insufficient community integration, which are essential for improving deterrence in Romblon's susceptible zones, in the absence of baseline enforcement data. Targeted assessments can inform adaptive solutions that align provincial realities with national blue laws.

Environmental crimes are wildly disturb the natural resources which significantly affects the daily lives of every individuals. This illegal activities not just exploit the environment but also the future of our new generation. It take away the possibility of this young generation to enjoy the beauty of God's given creation, which taken for granted by those greedy individuals.

In this context, it is important to examine the extent to which community initiatives contribute to the effective enforcement of fishery laws through active engagement, monitoring, and participation in policy development. Addressing these issues requires developing comprehensive enforcement strategies and targeted intervention programs to strengthen the implementation of environmental blue laws in the province of Romblon. Given the long-standing challenges in marine protection, conservation, and illegal fishing in the province, as highlighted in the previous data, to identify the multifaceted causes of illegal fishing, assess existing enforcement strategies, and evaluate the role of community participation in prevention through monitoring and policy development.

Toward this end, it was needed to identify the extent community initiative contribute in effective enforcement of fishery laws through their active engagement and their participation in monitoring and policy development. There was a need to address the issues by developing an enforcement strategy to enhance and providing an intervention program for a more intensified enforcement of the environmental blue laws in the province of Romblon. As a long standing issue, especially in marine protection, conservation and illegal fishing in the province as revealed by the data in the previous paragraph above, this study were revealed the different causes of illegal fishing along with the enforcement strategies and the extent of community participation in prevention through monitoring and policy development.

This study aimed to investigate the multifaceted contributory causes, policy implementation and the community initiative in combatting illegal fishing activities in Romblon Province, Philippines. Specifically, it sought to assess the multifaceted contributory causes of illegal fishing in terms of social, economic and political causes; to determine the observation of the respondents on enforcement policies in combatting illegal fishing in terms of detection, response and deterrence; to assess the perception of the respondents on the community initiatives in suppression and prevention of illegal fishing in terms of engagement, monitoring, and policy and governance; to test the significant difference on multifaceted contributory causes, enforcement policies, community initiatives in combatting illegal fishing when grouped according to observation of the participants; to test the significant relationship among the multifaceted contributory causes, enforcement policies, community initiatives in combatting illegal fishing practices; and to propose an intervention program to address and strengthen anti-illegal fishing campaign.

Methodology

Research Design

The descriptive design was used in this study. Descriptive analysis aims to accurately and systematically describe a population, situation, or phenomenon. It can answer what, where, when, and how questions, but not why questions. A research design is the framework used for the planning, implementation and analysis of a study. Quantitative research designs center on numerical data collection and analysis to answer the research question or hypothesis. This is achieved through the application of objective, systematic and thorough processes to generate knowledge. These are reported in clear and transparent manner that permits replication of the methodology by other researchers (Slater & Hasson, 2024).

This approach was used to assess the thoughts and perceptions of the research participants, which enabled the development of an understanding to the Multifaceted Contributory Causes, Enforcement Policies and Community Initiatives on Illegal Fishing in the Southern Philippines. They could have the opportunity to describe the scope of policy enforcement and community initiative in prevention of illegal fishing activities. On the other hand, through this method, the factors influencing illegal fishing were also determined. The primary source of quantitative data was the respondents' responses to the questionnaires that provided access to their perceptions and opinions that were effectively gaining insight into the problem being investigated.

Participants of the Study

The participants of this study consist of two groups, the first groups were from the law enforcement officers who enforce and regulate illegal fishing, and the other group were from the fisher-folks. The data were collected from the law enforcement agencies, 16 total personnel from PNP Maritime Group, 148 total personnel from Coast Guard and 12 total personnel from BFAR in the province of Romblon, which all in all, it has 176 total population from law enforcement, which regulate the illegal fishing in the province of Romblon. In addition, research participants from the community living in coastal areas, particularly the fisher-folks. According to the data given by the BFAR Romblon Provincial office, there are a total of 34, 130 registered fisher-folks in the province. To get the total number of population, the researcher utilize the Raosoft application, as result, 121 total sample size of population from law enforcement and 380 total sample size of population from fisher-folks. Using the Purposive sampling, the participants were selected. These groups of respondents were chosen because they have been provided sufficient information considering that they have firsthand information as they were directly involved in establishing and ensuring sustainable development and protection of the coastal and marine resources in the province. As well, participants from community who were living from coastal areas. These participants

were believed to have a strong perception in illegal fishing activities in the local. The data was collected from the said groups of respondents as primary sources through the use of research questionnaire.

Data Gathering Instrument

Questionnaire was the main data gathering instrument to use in the study. It was structured by the researcher based on the various literature, theories and suggestions of advisers to substantiate the contents of the questionnaire. Then, based on the title and objectives, the Survey Instrument was prepared to answer research objectives and to address the problems. After that, the Survey Instrument was validated by the experts; the Dean of the College of Criminal Justice Education, a registered criminologist and a holder of a degree in Doctor of Philosophy in Criminal Justice; a Registered Psychometrician, Guidance Counselor of National University, Calamba, Laguna; and the Officer in charge of BFAR in Romblon.

The data gathering instrument underwent a content validation and ethics review to ensure the reliability and validity of every research question stated therein. Right after, it was subjected to pilot testing.

The researcher employed a self-structured survey questionnaire; this was administered to the target respondents. In gathering data, the researcher utilized the survey questionnaire. It was divided into two parts. The first part was about the demographic profile of the respondents, while the second part was about the Multifaceted Contributory Causes of illegal Fishing, the scope of policy implementation to regulate illegal fishing activity and the extent of community initiation in effective implementation of fishery laws.

To validate the questionnaire of this study, pre-test was employed; Survey questionnaire was administered to the respondents who were not the actual respondents of this study.

Reliability test was employed to check whether all items were reliable. A pilot study was conducted to determine the internal consistency reliability of the research instrument entitled "Evaluate the Degree of Multifaceted Contributory Causes in Illegal Fishing." The instrument was designed to assess the contributory causes of illegal fishing in terms of social, economic, and political factors; the policy enforcement dimensions of detection, deterrence, and response; and the extent of community initiatives in terms of engagement and education, monitoring, and policy and governance.

Cronbach's alpha (α) was utilized to measure the internal consistency of each subscale of the instrument. This coefficient indicates the degree to which items within a set are interrelated, with higher values reflecting stronger reliability. According to George and Mallery (2003), reliability coefficients can be interpreted as follows: $\alpha \geq .90$ is excellent, $\alpha \geq .80$ is good, $\alpha \geq .70$ is acceptable, $\alpha \geq .60$ is questionable, $\alpha \geq .50$ is poor, and $\alpha < .50$ is unacceptable.

Reliability Coefficients of the Research Instrument

Subscale / Dimension	Number of Items	Cronbach's Alpha (α)	Interpretation
Social Causes	5	0.72	Acceptable
Economic Causes	5	0.80	Good
Political Causes	5	0.76	Acceptable
Policy Enforcement – Detection	5	0.81	Good
Policy Enforcement – Deterrence	5	0.83	Good
Policy Enforcement – Response	5	0.79	Acceptable
Community Initiatives – Engagement	5	0.77	Acceptable

Overall Instrument 45 0.80 Good

Note. Values are based on pilot test results using responses from the preliminary participants (N = 20).

Ethical Considerations

This study was conducted with ethical considerations to safeguard each participant's rights, dignity, and welfare. It was carried out in compliance with the ethical guidelines of research. Formal consent was obtained from the participant relevant to law enforcement agencies and fisher-folks prior to data collection. Through a thorough explanation and informed consent procedure, each participant was fully told about the goal of the study, the nature of their involvement, and the anticipated duration of participation. Likewise, the researcher did not insist nor force the unwilling respondents; only the respondents who voluntarily agreed with this must be administered. The handling of personal information of the respondents was highly observed; thus, confidentiality was maintained. Respondents' rights, privacy, rights to presumption of innocence and all things about the respondent was not divulged or included in this research.

Furthermore, the study underwent review by the institutional Ethics Research Review Committee, after which an approval letter was issued to the researcher.

Results and Discussion

Profile Variables	Frequency	Percentage (%)
Age		
13 – 28 years old	13	3.4
19 – 44 years old	155	39.9
45 – 60 years old	216	55.7
61 – 79 years old	4	1.0
Mean ± S.D.	13	3.4
Civil Status		
Single	18	4.6
Married	369	95.1
Widow	1	.3
Highest Educational Attainment		
Elementary	12	3.1
High school	369	95.1
College	7	1.8
Post Graduate		
Sex		
Male	367	94.6
Female	21	5.4

Table 1. Percentage Distribution of the Fishermen Profile

Table 1 shows the percentage distribution of the fishermen profile. As shown, in terms of age, age range 45-60 years old obtained the highest frequency count of 216 or 55.7% and the lowest is age range 61-79 years old with frequency count of four or 1.0%. The standard deviation of 13 or 3.4%. The age profile implies that fishermen were reflects mostly by a middle-aged. This is like statement according to BFAR (2022), in the Philippines, 24.66% of registered fisher-folk were aged 41–50, 22.97% were 51–60, and 22.42% were 61 and above, showing a similar trend of older and middle-aged dominance in the fishing sector. This implies that, the sustainability, safety, and future of the fishing industry are all significantly impacted by the majority of middle-aged fisherman. Because middle-aged adults make up most of the workforce, many fishermen have years of experience and technical expertise that can help the sector by improving skills and adaptability. But it also implies that younger generations are underrepresented, which could jeopardize the industry's long-term viability and creativity.

In terms of civil status, educational attainment and sex profile of fisher-folks reflects mostly by married, male workforce, with high school education commonly as their academic attainment. It highlights the civil status and educational structures implies a family's strong dependence on fishing due to limited occupational diversification. On the other hand, sex configuration and distribution confirms that fishing was a largely a masculine occupation, although there are some few female involvements.

These demographic profile's characteristics essentially give baseline information for responsible government agencies and offices such as policymakers, local government units, and even those in fisheries development agencies in for crafting and formulating a livelihood program which will support sustainability practices, skills upgrading, and morale tone for the youth to engage in the fishing industry in legal means. It was supported by Ziegenfuss, et al. (2021), wherein, it was stated that, demographic profile was important to describe the population of survey responders, illuminate potential disparities, and ultimately advance equity. Little is known about their impact on survey response rate or measurement.

Profile Variables	Frequency	Percentage (%)
Age		
13 – 28 years old	8	6.6
19 – 44 years old	94	77.0
45 – 60 years old	20	16.4
Mean ± S.D.	13	3.4

Civil Status		
Single	23	18.9
Married	98	80.3
Widow	1	.8
Highest Educational Attainment		
College	121	99.2
Post Graduate	1	.8
Sex		
Male	100	82.0
Female	22	18.0
Agency		
Maritime Police	20	16.4
BFAR	21	17.2
Coast Guard	81	66.4

Table 2. Percentage Distribution of the Law Enforcement Profile

Table 2 shows the percentage distribution of the law enforcement profile. As shown, in terms of age, age range 19-44 years old obtained the highest frequency count of 94 or 77.0% and the lowest is age range 13-28 years old with frequency count of 8 or 6.6%. Research of Frick et al. (2024) on law enforcement age distribution indicated that majority of officers are typically within the 19-44 age range, reflecting the physically demanding nature of the job and recruitment policies favoring younger adults. In addition, law enforcement agencies often set age limits for recruitment to ensure physical fitness and career longevity. In terms of sex, male is shown to be dominant compared to female with a frequency count of 100 or 82.0%. This means, male officers dominate most law enforcement agencies globally. Studies also note that while the number of women in law enforcement is increasing, they remain a minority, especially in higher ranks and specialized units (Marrier, Todak, Baker & Ondercin, 2025). Meanwhile, when it comes to their work, Coast Guard were predominant among others, with a frequency count of 81 or 66.4%. When it comes to specific agencies, the Coast Guard is often predominant among maritime law enforcement personnel. It describes itself as the lead federal maritime law enforcement agency and the only agency with both the authority and capability to enforce national and international law on the high seas, including drug trafficking and fisheries law enforcement (GAO, 2025).

This demographic profile provides a significant insight into capacity-building and policy formulation for continuous improvement, effective and efficient enforcement of the law. In addition, it provides baseline information in designing training programs, planning initiatives, and gender-inclusive strategies for more effective fisheries law enforcement that will be supposed to protect marine ecosystem as well as regulate illegal fishing activities. It was agreed by Ray (2020) who stated that demographic data help to provide transparency, inclusion and equity. He further stated that a lack of demographic data often leads to bad science, does a disservice and inhibits ability in continuing to be innovative and comprehensive. In accordance with Connelly (2020), the study used precise inclusion and exclusion criteria to guarantee the acquisition of pertinent, trustworthy, and high-quality data. Participants comprised members of the coastal community, mostly fishermen, who had first-hand knowledge of or exposure to illicit fishing activities, as well as law enforcement officers directly assigned to sea patrols and enforcement of illegal fishing legislation. Participants who were hesitant to participate, those from organizations not primarily engaged in fisheries enforcement, those with conditions that would compromise participation or data quality, and those with little or no relevant experience were also removed. The study used purposive sampling to choose participants who were best suited to meet the study's goals. To ensure scientific rigor and ethical compliance, data were collected via structured questionnaires with formal authorization obtained from law enforcement agencies and barangay authorities.

	Fishermen			Law Enforcement			Over-all		
	Mean	VI	R	Mean	VI	R	Mean	VI	R
1. Social	3.09	A	1	3.39	A	1	3.24	A	1
2. Economic	3.06	A	3	3.21	A	2	3.14	A	2
3. Political.	3.07	A	2	3.18	A	3	3.13	A	3
Composite Mean	3.07	A		3.26	A		3.17	A	

Table 3. Summary on Multifaceted Contributory Political Causes in Illegal Fishing

Table 2 shows the summary table on multifaceted contributory causes in illegal fishing. The composite mean of 3.07 for fishermen, 3.26 for law enforcement, and 3.17 overall, all described as “agree”. The highest multifaceted contributory cause is social that gained weighted mean values of 3.09 for fishermen, 3.39 for law enforcement and 3.24 for overall, all interpreted as “agree”. Indicates that both groups recognize social factors as a significant driver of illegal fishing in the region. Fishermen may feel compelled by their families or communities to engage in illegal practices to meet basic needs, while law enforcement sees these social dynamics as barriers to effective regulation and compliance. Alvarico et al. (2021); Arong et al (2023); Belardo (2025) noted that fishermen were motivated to engage in illicit fishing by their families, friends, and communities. They spur to shift their traditional fishing methods due to their family needs, particularly the education and the unexpected hospitalization among family members

The lowest multifaceted contributory cause for fishermen was economic cause that gained weighted mean value of 3.06, interpreted as “agree”. This conclusion is noteworthy because it contradicts the widely held belief that the main causes of illicit fishing are poverty and financial need. Instead, fishers may consider economic factors as secondary, partly because they perceive other causes such as community norms, lack of alternatives, or inadequate enforcement as more relevant or important. The Oceana (2025), stated that, due to the presence of large scale fisher and commercialized fishing boat in the Philippine sea water’s, the ordinary fisher-folks lost their opportunity to catch fish in legal means, which they end up in illegal fishing as they were lack of alternative livelihood to provide for their basic needs.

While for law enforcement, the lowest multifaceted contributory cause was political that gained weighted mean value of 3.18, interpreted as “agree”. It indicates that law enforcement officials perceive political causes as less influential compared to social, economic, or institutional factors in driving illegal fishing. In the study if Praguslinardo and Sunggara (2024); Arbiol and Minh (2025) revealed that law enforcement against illegal fishing in several places faces several challenges, such as limited resources for law enforcement officers, low public legal awareness, and weak coordination among relevant agencies.

Overall, the lowest multifaceted contributory cause is political that gained weighted mean value of 3.13, interpreted as “agree”. This agreement implies that both groups give other factors like social, economic, or institutional causes priority over political ones, despite the acknowledged significance of policy and governance in fisheries management. The comparatively low grade suggests that the primary obstacles to combating illegal fishing are not thought to be political will, governmental action, or policy shortcomings. As defined by Political Ecology it says that it is rooted in the idea that environmental problems are not just ecological concerns but are shaped by historical and political processes (Sovacool, 2021).

	Fishermen			Law Enforcement			Over-all		
	Mean	VI	R	Mean	VI	R	Mean	VI	R
1. Detection	3.1	A	2	3.19	A	1	3.15	A	1
2. Response	3.07	A	3	3.14	A	3	3.11	A	3
3. Deterrence	3.11	A	1	3.17	A	2	3.14	A	2
Composite Mean	3.09	A		3.17	A		3.13	A	

Table 4. Summary Table on Policy Enforcement on Illegal Fishing

Based on the results presented in Table 2, respondents generally agree on the effectiveness of policy enforcement on illicit fishing, with an overall composite mean of 3.13. Detection was the most highly rated of the three aspects with a mean score of 3.15 garnered the rank 1, suggesting that methods like patrol visibility, monitoring systems, and community coordination are thought to be the most effective parts of enforcement.

This shown that stakeholders view the ability of authorities to detect and locate illegal fishing activity as the greatest aspect of present enforcement efforts. However, Lim (2025); Gordon (2025), stated that, weak governance and legal loopholes in the Philippines are enabling illegal, unreported and unregulated (IUU) fishing despite enforcement efforts, raising concerns over regulatory effectiveness and marine sustainability. It implies that, despite of law enforcement ability to detect and locate illegal fishing but still, legal loopholes were still there, these illegal activities will continuously bombarding the marine ecosystem. For that matter, Oceana Philippines (2025), stated that, enforcement of fisheries and environmental laws requires effective monitoring, control, and surveillance measures.

With an aggregate mean of 3.14 deterrence comes in second, suggesting that the presence of law enforcement, evident consequences, and punishments all play a major role in deterring offenders. Although somewhat lower than Detection, its

high grade suggests that preventive interventions are operating successfully but may still require extra reinforcement to promote long-term behavioral change among fishers. As stated by Praguslinardo and Sunggara (2024), the role of deterrent factor contributed to lessen the case of illegal fishing. The presence of law enforcement and efficient penalty will do the same. However, as they have been argued that, corruption and weak coordination among law enforcement agencies further exacerbate the problem, making it difficult to achieve effective deterrence. In Pilar Sorsogon, its municipality (2021), stated that, if seaborne patrol would operate regularly, it definitely deter the operation of illegal fishing.

Response, which has the lowest overall mean of 3.11 among the three topics indicates areas that require improvement, especially in the enforcement teams' operational preparedness, speed, and consistency after unlawful fishing is detected. The comparatively lower ranking indicates that although law enforcement can identify illicit activity, prompt response, staff availability, and incident follow-up are the challenges. In relation to that, in the study of Terry and Donato (2024) revealed that, the law enforcement unit is unable to carry out maritime surveillance activities and quick response to a reported illegal fishing activities as a result of the insufficient floating vessels and the insufficient amount of money allocated for operations. This give a clear point of view, wherein, sufficient resources are indispensable in dealing with illegal fishing. As such, Suan (2024) stated that, despite of national and local regulation are present, their impact however is limited due to resources gaps which can be utilize in response to illegal fishing activities. Similarly, according to Angelo (2025), responding to illegal fishing activity is quite difficult due to lack of resources. He stated that, limited manpower and equipment impair their effectiveness in responding towards it.

Overall, the findings suggest that while policy enforcement measures are most successful in detecting illicit fishing operations, they are less successful in promptly addressing them. A more thorough and effective enforcement framework against illegal fishing requires bolstering response capabilities and maintaining deterrence tactics, particularly through public sanctions and political support. However, Fujii and Kawamura (2021), the challenges of effectively responding to illegal fishing vessels are compounded by limited infrastructure and financial support at the local level.

	Fishermen			Law Enforcement			Over-all		
	Mean	VI	R	Mean	VI	R	Mean	VI	R
1. Engagement	3.07	A	3	3.1	A	3	3.09	A	3
2. Monitoring	3.1	A	1	3.17	A	2	3.14	A	1.5
3. Policy and Governance	3.09	A	2	3.18	A	1	3.14	A	1.5
Composite Mean	3.09	A		3.15	A		3.12	A	

Table 5. Summary Table on the Extent of community initiatives in effective enforcement of Fishery Laws as to Policy and Governance.

Based on Table 12, illustrated the amount of community activities in the effective enforcement of fishery regulations as to policy and governance, the results reveal variable levels of implementation across the three parameters. For both groups of respondents, the Fishermen and Law Enforcement, the greatest mean scores are grouped around Monitoring and Policy and Governance. The two indicators with the highest total means were Monitoring and Policy and Governance, both of which received the same mean of 3.14, which is read as Agree. These results show that most respondents acknowledge the important role that regulatory frameworks and monitoring efforts play in guaranteeing adherence to fishing laws. These two indicators are consistently ranked as the highest priorities, which suggests that procedures for policy implementation, regulation, and oversight are operating efficiently and are seen as essential pillars in the protection of maritime resources. It was supported by the study of Binobo, Bradshaw and Chowdhury (2024), which revealed that marine fisheries governance in the Philippines is primarily dominated by participatory governance, specifically co-management, which encourages public-private partnerships. With that, Komara and Dermawan (2025) also noted that, efforts to combat maritime crime including illegal, unreported and unregulated fishing in the ASEAN region are the collective responsibility of all member states including its community members. The US Embassy in Manila (2021) added that, a responsive governance structure, and that reducing IUU fishing is a shared responsibility that requires a whole-of-society approach guided by science.

Engagement, on the other hand, registered as the lowest of the three indicators with an overall mean of 3.09, even if it was still verbally characterized as Agree. This implies that although there was community involvement in fishing law enforcement, it is not as strong as monitoring and policy-related initiatives. The ranking demonstrates that stakeholder involvement particularly from fishers and local residents which has not yet reached its ideal potential. Furthermore, even though the difference was small, it raises a subtle but significant issue with the level of community empowerment and mobilization in law enforcement initiatives. This emphasizes the importance of community involvement in addressing the root causes of illegal fishing, as well as the need for more comprehensive and coordinated policy responses from both local and national governments (Praguslinardo & Sunggara, 2024). Highlighting the indispensable role of

community involvement in regulating illegal fishing, Noble and Aguja (2024), agreed that the increased community participation in law enforcement and monitoring will improve compliance with rules, which strengthened support for conservation and law enforcement initiatives. Furthermore, Smith et al (2025), stated that the regions with higher community-level engagement saw greater increase in management support and compliance.

	group	N	Mean	U	p-value	Interpretation
Social	Fishermen	388	3.09	11641	<.001	Highly Significant
	Law Enforcement	117	3.38			
Economic	Fishermen	388	3.06	16801.5	<.001	Highly Significant
	Law Enforcement	117	3.21			
Political	Fishermen	388	3.07	17915	<.001	Highly Significant
	Law Enforcement	117	3.18			

Table 6. Comparison of Responses of the Two Groups on Multifaceted Contributory Social Causes in Illegal Fishing

Table 4 shows the comparison of responses between fishermen and law enforcement personnel regarding the multifaceted contributory causes of illegal fishing in terms of social, economic, and political aspects. Using the Mann-Whitney U test, the results reveal highly significant differences between the two groups across all three dimensions, with p-values less than .001. In the social causes, law enforcement respondents obtained a higher mean score (3.38) compared to the fishermen (3.09), indicating that law enforcers perceive social factors such as community behavior, norms, and awareness as stronger contributors to illegal fishing than the fishermen do. However, the Word Ocean Review (2018) stated that, that IUU fishing was mainly practiced in those places which exhibit a weak governance, large-scale corruption, ambivalent legislation, and a lack of will or capacity to enforce existing national legislation.

A similar pattern is observed in the economic and political causes, where law enforcement still reported higher mean scores (3.21 and 3.18, respectively) compared to fishermen (3.06 and 3.07). These differences suggest a variation in perspective between the two groups: law enforcement tends to view economic pressures and political influences as more prominent drivers of illegal fishing, while fishermen may perceive these factors as less influential or more normalized within their daily realities. Differently, the study highlighted that marginalized fishers often struggle to secure stable livelihoods, as others possess a modern fishing equipment, while they are lacking for the same and government supports, therefore, they tend to end up in illegal fishing activity.

Studies confirm significant perceptual differences between fishers and enforcers on illegal fishing drivers, with law enforcement attributing higher influence to social norms, economic pressures, and political factors like lax enforcement, aligning with Mann-Whitney U findings of $p < .001$ differences. Toward this end, Lariosa (2024) stated that, in the Philippines, fishermen often normalize practices due to poverty and peer influences, viewing them as survival necessities, while enforcers emphasize community behavior and weak rules as primary causes.

	group	N	Mean	U	p-value	Interpretation
Detection	Fishermen	388	3.10	18564	0.003	Significant
	Law Enforcement	117	3.19			
Response	Fishermen	388	3.07	19970	0.047	Significant
	Law Enforcement	117	3.14			
Deterrence	Fishermen	388	3.11	20049.5	0.054	Not Significant
	Law Enforcement	117	3.17			

Table 7. Comparison of Responses of the Two Groups on Policy Enforcement on Illegal Fishing

Table 5 displays the comparison between fishermen and law enforcement personnel regarding their assessment of policy enforcement on illegal fishing, particularly in terms of detection, response, and deterrence. Using the Mann-Whitney U test, the results show a significant difference between the two groups in the areas of detection ($U = 18564$, $p = 0.003$) and response ($U = 19970$, $p = 0.047$). In both aspects, law enforcement personnel gave higher mean ratings (3.19 for detection and 3.14 for response) compared to fishermen (3.10 and 3.07, respectively). This suggests that law enforcers perceive the processes of identifying and responding to illegal fishing incidents as more effective than how they are perceived by the fishermen. In relation to this, each group's unique roles and experiences may be the cause of this disparity in perception. Because they participate actively in surveillance and enforcement operations, law enforcement officers have a more

positive perception of their efficacy. Fishermen, on the other hand, might base their evaluation on personal experiences, such as the regularity and visibility of enforcement operations in their towns, which could result in a more critical viewpoint. Therefore, to develop the same viewpoint, Praguslinardo and Sunggara (2024) suggest that, enhancing the capacity of law enforcement officers, increasing public legal awareness, and strengthening inter-agency coordination. A holistic approach involving community participation is also necessary for marine resource conservation.

However, for deterrence, no significant difference was found between the two groups ($U = 20049.5$, $p = 0.054$), even though law enforcement still had a slightly higher mean score (3.17) than the fishermen (3.11). This indicates that both groups share relatively similar views regarding the effectiveness of penalties and preventive measures against illegal fishing. This result suggests that the perceived efficacy of deterrence is constant for both groups, in contrast to detection and response. Even if they have different opinions about detection and response, both fishermen and law enforcement seem to think that the fines and preventive measures in place can deter unlawful fishing. On that statement, Jiang and Sun (2025) agreed, they stated that, the fisheries administration is responsible for formulating policies and measures for the protection of fisheries resources. It takes action and imposes penalties against illegal fishing to serve as deterrence countermeasures against illegal activities.

	group	N	Mean	U	p-value	Interpretation
Engagement	Fishermen	388	3.07	21307	0.311	Not Significant
	Law Enforcement	117	3.10			
Monitoring	Fishermen	388	3.10	19708	0.029	Significant
	Law Enforcement	117	3.18			
Policy and Governance	Fishermen	388	3.09	18488.5	0.002	Significant
	Law Enforcement	117	3.18			

Table 8. Comparison of Responses of the Two Groups on Extent of community initiatives in effective enforcement of Fishery Laws.

Table 6 presents the comparison of responses between fishermen and law enforcement personnel on the extent of community initiatives in the effective enforcement of fishery laws, specifically in terms of engagement, monitoring, and policy and governance. The Mann–Whitney U test results show that for community engagement, there is no significant difference between the two groups ($U = 21307$, $p = 0.311$). This suggests that both fishermen (3.07) and law enforcement (3.10) share a similar perception regarding the level of community participation and involvement in fishery law enforcement activities. This result shows that there is a general consensus that community involvement in fishing, law enforcement is neither very strong nor weak. Both law enforcement and fishermen seem to view the community's engagement as moderate; neither group expressed a markedly higher or lower level of confidence in the degree of community involvement. Research indicates that strong social ties, mutual trust, and shared long-term goals encourage community members to, engage and self-regulate, ensuring that rules are enforced fairly (Partelow et al. 2022).

However, significant differences are observed in the dimensions of monitoring and policy and governance. For monitoring, law enforcement respondents reported a higher mean score (3.18) than fishermen (3.10), with the difference being statistically significant ($U = 19708$, $p = 0.029$). This indicates that law enforcers perceive community monitoring efforts, such as reporting and surveillance of illegal fishing activities, to be more active or effective compared to how fishermen view them. Similarly, for policy and governance, law enforcement respondents also gave higher ratings (3.18) than fishermen (3.09), and the difference is statistically significant ($U = 18488.5$, $p = 0.002$). This implies that law enforcers have a more positive perception of how communities engage in policy development and support governance mechanisms related to fishery law enforcement. Dahanayake (2025), stated that, collective action theory argued that self-governance and community-led initiatives play a crucial role in the sustainable management of common-pool resources. Research has highlighted that small communities, when provided with the right institutional support, can create effective mechanisms to regulate resource use, enforce compliance, and ensure long-term sustainability.

Social Cause	rho-value	p-value	Interpretation
Detection	.423**	<.001	Highly Significant
Response	.427**	<.001	Highly Significant
Deterrence	.583**	<.001	Highly Significant
Economic Cause			
Detection	.349**	<.001	Highly Significant
Response	.361**	<.001	Highly Significant
Deterrence	.421**	<.001	Highly Significant

Political Cause			
Detection	.400**	<.001	Highly Significant
Response	.418**	<.001	Highly Significant
Deterrence	.549**	<.001	Highly Significant

Table 9. Relationship Between Multifaceted Contributory Causes in Illegal Fishing and Policy Enforcement on Illegal Fishing.

Table 7 shows that all dimensions of the multifaceted causes of illegal fishing social, economic, and political have statistically significant relationships with policy enforcement in terms of detection, response, and deterrence ($p < .001$). For social causes, moderate positive correlations are observed with detection ($\rho = .423$) and response ($\rho = .427$), while a stronger relationship is found with deterrence ($\rho = .583$), indicating that community-related factors and social behaviors are closely linked with the effectiveness of preventive measures. Similarly, economic causes show significant but relatively lower correlations with detection ($\rho = .349$) and response ($\rho = .361$), suggesting that livelihood pressures and financial motivations influence how authorities identify and act on illegal fishing activities. However, the relationship is stronger with deterrence ($\rho = .421$), implying that economic conditions also shape how effective preventive policies are implemented and perceived. The results demonstrate that combating illegal fishing necessitates a comprehensive strategy that takes into account social and economic factors in addition to enforcement measures. To improve detection, reaction, and deterrent, effective policy enforcement must take livelihood demands and community dynamics into consideration. Increasing community involvement and tackling economic vulnerabilities can boost fisheries management's overall efficacy. In equal value, the success of all these depends on several key factors, including social cohesion, trust among members, institutional backing, and the presence of clear rules and enforcement mechanisms (Shi & Ling 2025).

For political causes, all three enforcement aspects also demonstrate significant associations, with moderate correlations for detection ($\rho = .400$) and response ($\rho = .418$), and a stronger link with deterrence ($\rho = .549$). This highlights the crucial role of political will, governance, and institutional support in the enforcement of anti-illegal fishing policies, particularly in strengthening deterrent mechanisms. In connection to that, Tiaradipa and Hidayatullah (2024), stated that, political influences and corruption often hinder meaningful action against illegal fishing, leaving local communities vulnerable to economic instability and loss of livelihood opportunities.

Social Cause		rho-value	p-value	Interpretation
Engagement		.355**	<.001	Highly Significant
Monitoring		.356**	<.001	Highly Significant
Policy		.459**	<.001	Highly Significant
Economic Cause				
Engagement		.294**	<.001	Highly Significant
Monitoring		.340**	<.001	Highly Significant
Policy		.457**	<.001	Highly Significant
Political Cause				
Engagement		.355**	<.001	Highly Significant
Monitoring		.295**	<.001	Highly Significant
Policy		.373**	<.001	Highly Significant

Table 10. Relationship Between Multifaceted Contributory Causes in Illegal Fishing and Extent of community initiatives in effective enforcement of Fishery Laws.

Table 8 shows that the multifaceted contributory causes of illegal fishing social, economic, and political are all significantly related to the extent of community initiatives in enforcing fishery laws, as reflected by the rho values and p-values all below .001. Under the social causes, moderate positive correlations were found with community engagement ($\rho = .355$) and monitoring ($\rho = .356$), while a stronger relationship emerged with policy initiatives ($\rho = .459$). This means that social factors such as community awareness, shared values, and collective responsibility are closely associated with how actively communities participate in law enforcement, especially in supporting and strengthening local fisheries policies. Moreover, economic causes also demonstrated significant relationships, with weaker correlations for engagement ($\rho = .294$) and monitoring ($\rho = .340$), but a stronger association with policy initiatives ($\rho = .457$), implying that economic pressures and livelihood concerns influence how communities respond to and support policy-driven enforcement efforts. With that, research suggests that for community-based fisheries enforcement management to be successful, stronger institutional support, financial assistance, and leadership development programs are necessary resilience (Koralagama, 2022).

The political causes likewise showed significant relationships with all three areas of community initiatives, presenting moderate correlations with engagement ($\rho = .355$), monitoring ($\rho = .295$), and policy ($\rho = .373$). These findings suggest that local leadership, governance structures, and political support play a key role in empowering communities to participate in law enforcement, although to a lesser degree compared to social and economic dimensions. With regards to that, although, Government policies have attempted to regulate the existence of illegal fishing, yet enforcement remains inconsistent therefor, making it difficult to maintain a balance between economic survival and environmental protection (Nishanthan et al. 2019).

Detection	rho-value	p-value	Interpretation
Engagement	.505**	<.001	Highly Significant
Monitoring	.626**	<.001	Highly Significant
Policy	.604**	<.001	Highly Significant
Response			
Engagement	.422**	<.001	Highly Significant
Monitoring	.513**	<.001	Highly Significant
Policy	.600**	<.001	Highly Significant
Deterrence`			
Engagement	.411**	<.001	Highly Significant
Monitoring	.471**	<.001	Highly Significant
Policy	.486**	<.001	Highly Significant

Table 11. Relationship Between Policy Enforcement on Illegal Fishing and Extent of community initiatives in effective enforcement of Fishery Laws.

Table 11 shows that all dimensions of policy enforcement on illegal fishing detection, response, and deterrence are significantly related to the extent of community initiatives in the effective enforcement of fishery laws, with all relationships being highly significant at $p < .001$. For the detection dimension, strong positive correlations are observed with community engagement ($\rho = .505$), monitoring ($\rho = .626$), and policy support ($\rho = .604$). This indicates that when authorities are more capable of identifying illegal fishing activities, communities also tend to be more active in participating, monitoring local waters, and supporting fishery policies.

In addition to that, Praguslinardo and Sunggara (2024) revealed that, Indonesian research links authority-led detection to heightened community participation, with statistical associations showing reduced illegal practices when monitoring systems complement volunteer efforts. Among these, the strongest association is with community monitoring, suggesting that effective detection systems encourage or complement active community surveillance and reporting mechanisms. To sum up, Kuemlangan et al (2023), stated that, robust detection legitimizes community roles, driving engagement via shared norms and resources, though gaps persist without sustained policy support.

In terms of response and deterrence, all relationships remain highly significant, although slightly lower than those for detection. Response shows moderate to strong correlations with engagement ($\rho = .422$), monitoring ($\rho = .513$), and policy initiatives ($\rho = .600$), implying that timely and appropriate actions by enforcement agencies strengthen community trust and willingness to be involved in law enforcement efforts. To impose a deterrent measures, seaborne patrol must be utilized. As stated by Noble and Aguja (2024), the presence of patrols increases trust among fishing communities, highlighting the significance of following rules for the group as a whole advantage. However, sufficient funding, instruction, and community support could help these activities, cooperation to guarantee their long-term effectiveness in protecting maritime habitats and guaranteeing sustainable fishing. Meanwhile, deterrence also demonstrates significant associations with engagement ($\rho = .411$), monitoring ($\rho = .471$), and policy ($\rho = .486$), highlighting that consistent penalties and preventive measures contribute to higher levels of community participation and policy adherence. In addition, it is important to take into consideration that the lack of political representation further exacerbates the representation of community participation. Without strong advocacy groups or union representation, they often struggle to influence policy decisions that affect their livelihoods. Komara and Dermawa (2025), noted that, regional dialogue and coordination platform, facilitating intelligence sharing, joint patrols, capacity building, and policy harmonization among community is a notable mechanism to Combat IUU fishing.

Conclusion and Recommendations

The findings presented results indicating the causes of illegal fishing driven by a combination of social, economic, and political factors, social causes emerged as the most influential, highlighting the significant role of limited knowledge of

fisheries regulations, lack of livelihood alternatives, weak community and law enforcement linkages, and the social acceptance of illicit fishing practices. In addition, it emphasized that many fishers engage in illegal practices due to livelihood insecurity, inadequate access to modern equipment, limited government support, and insufficient awareness of conservation laws.

With regards to policy enforcement against illegal fishing it revealed that, detection emerged as the strongest enforcement component, suggesting that current efforts in patrol visibility, monitoring, and community coordination are successfully enabling authorities to identify illicit fishing activities. Relatively, deterrence also demonstrated a high level of effectiveness, indicating that law enforcement presence and penalties continue to discourage violations, although issues such as corruption and weak inter-agency coordination may limit its full potential. Response, however, received the lowest mean score, revealing persistent challenges in operational readiness, timely action, and resource availability once illegal activities are identified.

On the hand, on the extent of community initiatives in effective enforcement of the law, the results presented indicate that community activities supporting the effective enforcement of fishery regulations exhibit differing levels of implementation across the three assessed parameters. Monitoring and Policy and Governance emerged as the strongest components, reflecting respondents' agreement that regulatory structures and monitoring systems are functioning effectively and remain essential to sustaining lawful fishing practices. Conversely, the result in Engagement received the lowest mean score suggesting that while community participation in enforcement efforts exists, it is comparatively less robust. The slight yet notable difference highlights a gap in stakeholder mobilization, particularly among fishers and local community members.

Meanwhile, a comparison of responses between fishermen and law enforcement personnel regarding the multifaceted contributory causes of illegal fishing in terms of social, economic, and political aspects, reveal the results with a highly significant differences between the two groups across all three dimensions. This is indicating that law enforcers perceive social factors such as community behavior, norms, and awareness as stronger contributors to illegal fishing than the fishermen do. Similarly, the comparison between fishermen and law enforcement personnel regarding their assessment of policy enforcement on illegal fishing, particularly in terms of detection, response, and deterrence, show a significant difference between the two groups in the areas of detection. While the comparison of responses between fishermen and law enforcement personnel on the extent of community initiatives in the effective enforcement of fishery laws, specifically in terms of engagement, monitoring, and policy and governance. Revealed that there was no significant difference between the two. This suggests that both fishermen law enforcement share a similar perception regarding the level of community participation and involvement in fishery law enforcement activities.

Thus, Correlation test, shows that all dimensions of the multifaceted causes of illegal fishing social, economic, and political have statistically significant relationships with policy enforcement in terms of detection, response, and deterrence. For social causes, moderate positive correlations are observed with detection and response, while a stronger relationship is found with deterrence, indicating that community-related factors and social behaviors are closely linked with the effectiveness of preventive measures. Similarly, economic causes show significant but relatively lower correlations with detection, suggesting that livelihood pressures and financial motivations influence how authorities identify and act on illegal fishing activities. However, the relationship is stronger with deterrence, implying that economic conditions also shape how effective preventive policies are implemented and perceived.

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Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study; all data used were obtained from previously published sources as cited in the reference list.

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Appendices

No appendices are attached to this study.