Fishing Practices and TURF Compliance: An AGIL-Based Social Systems Analysis from Surigao del Sur, Philippines

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Abstract

The study explored fisher and household characteristics, fishing practices, and predictors of effective fishing in Ayoke Island with a Territorial Use Rights for Fishers (TURF), while applying Parsons' Social System Theory, AGIL, as the explanatory framework. The study's variables included economic capability (Adaptation), institutional support (Goal Attainment), enforcement factor (Integration), and sociocultural influence (Latency), along with sociodemographic characteristics of each fisher and his household (personal and household characteristics) to measure their significant effects on fishing practice. A mixed method with structured surveys and focus-group discussions was used to interview 117 fishers, and the data were processed and analyzed with descriptive statistics, the Pearson product-moment correlation test, and multiple regression analyses. Fishermen were predominantly male, relatively young, educated up to secondary level, showed strong place attachment, and possessed substantial fishing experience. Compliance with TURF regulations is significantly higher among long-term residents with increased experience with fishing. All AGIL variables significantly correlate with the practice of fishing, and all AGIL variables predicted effective fishing practice regardless of any sociodemographic variables included. The results suggest that economic ability, institutional support, sociocultural, and enforcement should all be included in any integrated coastal fisheries management plan. Based on these results, the study recommends a sustained holistic program to improve compliance, foster institutional support, and engage the active participation of fishers, particularly younger fishers, to enhance the long-term sustainability of coastal fisheries.

Keywords: Territorial Use Rights for Fisheries (TURF), coastal resource management, fishing practices, Social Systems Theory, Rural Sociology

Introduction

Human activities, such as illegal fishing and the use of prohibited techniques, have placed pressure on marine environments, leading to ecological degradation and socioeconomic problems such as food insecurity (White & Vogt, 2000). The loss of marine biodiversity has prompted policy measures to protect coastal environments and to limit coastal degradation (Bruno & Selig, 2007; Hoegh-Guldberg & Bruno, 2010). Coastal resource management instruments, especially Territorial Use Rights for Fisheries (TURF), are effective in addressing the common and high rate of unsustainable use of coastal resources. TURF allocates user rights to artisanal fishers in designated coastal zones and permits communities to manage the resource rather than focus on target species and their exploitation (Franco-Melendez, 2021; Afflerbach, 2014; Wilen et al., 2012).

TURFs ensure spatial rights, permit co-management, uphold community access, and institutionalize the TURF spatially. The introduction of TURFs can transform a community by altering the existing social norms, power structures, values, and the rules that affect the governance of coastal fisheries (Sanchez et al., 2021). Review of TURFs (in the Biobio Region of Chile) indicates only moderate levels of sustainability due to neglect of social elements, rather than only ecological components. Ethical and institutional aspects also require further development, thus rendering the TRUF at moderate levels of sustainability (Franco-Melendez, 2021). Additionally, co-management zones for fisheries can enhance income. One study observed an increase in mean income by 20% (Romero et al., 2021).

TURF success has spatial requirements and governance. Cooperatives govern TURFs in Japan and Chile, alleviating common-pool resource issues, encouraging adaptive management for food, income, and ecological sustainability (Wilen et al., 2012; Tsurita, 2018). Local government enforcement supports legitimacy, compliance, and connectivity (Oyanedel et al., 2018; Quynh et al., 2020); yet, enforcement remains challenging because of shifting fishing patterns, illegal fishing, and minimal ecological knowledge (Cerda, 2022; Davis, 2017), while economic incentives promote regulation compliance (Villena et al., 2005).

Philippine TURF research is scarce despite international recognition. Furthermore, the limited TURF studies in the Philippines are outdated, focusing only on acceptability, co-management, and participatory TURFs (Siar, 1991, 1992; Ferrer, 1991; Agbayani et al., 2000; Yacapin, 1995). The researchers aim to contribute to this research gap through the study of fishers' socio-demographics, economic capacity, institutional support and enforcement, and socio-cultural factors that may influence their fishing practices and their participation in TURFs in the Ayoke Island SFMAs. These transdisciplinary factors will determine an effective TURF to implement for sustainable fisheries governance, increased fisher livelihoods, and enhanced marine conservation efforts in the Philippines.

Theoretical Framework of the Study

This study employs Talcott Parsons' Social System Theory, which views society as a network of interrelated yet separate subsystems that make up different social systems. Parsons identifies four dimensions needed for a system to adapt and survive: Adaptation, the acquisition and allocation of material resources; Goal Attainment, the identification and achievement of common objectives; Integration, the coordination of and coherence among sub-units by institutions; and Latency, the maintenance and transmission of the system's culture (Ritzer, 2011). Society is a self-regulating ecosystem of patterned social interactions.

Applying this theory, the study assesses the adaptation of Ayoke Islanders' fishing practice. Fishing practice is the outcome variable; economic capacity (Adaptation), institutional support (Goal Attainment), enforcement factor (Integration), and sociocultural influence (Latency) are the mediators linking household and individual sociodemographic predictors as independent variables. Investigating these relationships explains how economic, institutional, regulatory, and sociocultural elements underpin the sustainable practice of fishing, highlighting the connectivity of social, economic, and ecological systems in the island's community-based fishery management system.

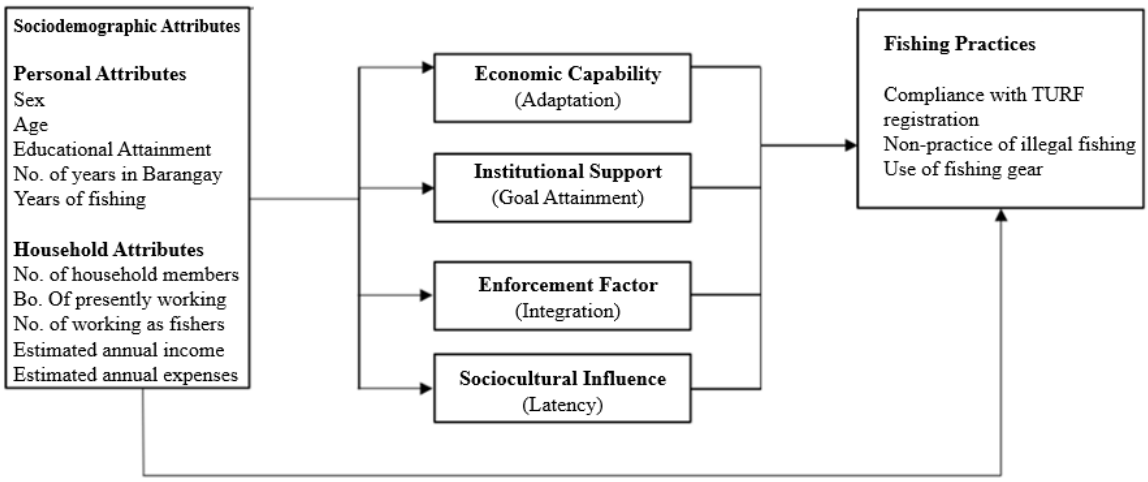

Figure 1. Theoretical Framework

Materials and Methods

2.1 Study area and collection

This research study employed a mixed-methods approach, which was selected to examine the behavioural focus of the study, such as fishing methods and fishermen's behaviours on Ayoke Island, Cantilan, Surigao del Sur. Mixed-methods research has its origins in the social sciences but has been applied to an enormous range of different fields (Wisdom & Creswell, 2013). The combination of both qualitative and quantitative approaches enhances the rigor and credibility of the findings while minimizing the deficiencies of each standalone approach. This particular research methodology enables a comprehensive examination of the different factors related to the fishing in the AISFMA area, with a focus on the behaviours and conditions of those fisheries.

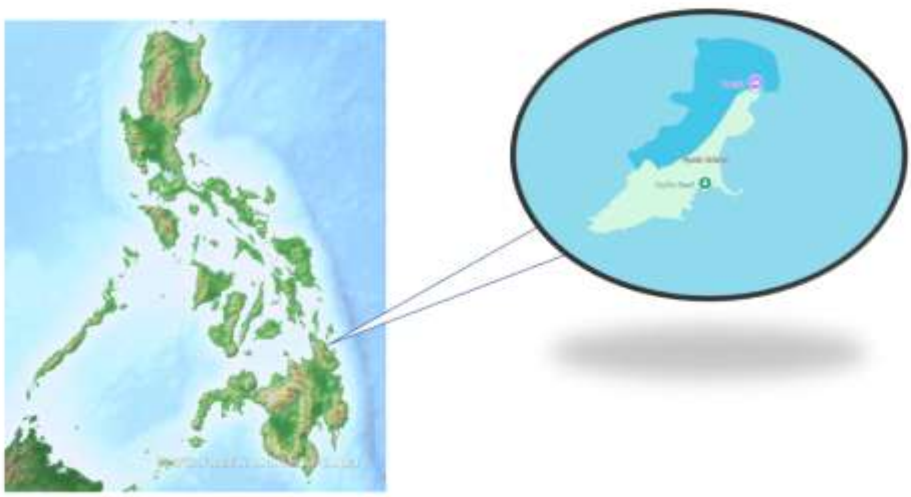

Fig. 2. Map of the Philippines and the Ayoke Island, Surigao del Sur
(Source: https://www.wvcwinterswijk.nl/world-map-of-philippines/)

2.2 Sampling and consent

The respondents were the fishers of Ayoke Island, which is a small island in Cantilan, Surigao del Sur, Philippines. The fishers of Ayoke Island are an important stakeholder group in the establishment of Territorial Use Rights for Fisheries (TURFs) because the fishers' livelihoods depend upon fishing, and they have limited alternative sources of income. Participants were eligible to participate in the study if they were adults (18 years or older, of any gender) and if they were directly or indirectly involved in capturing, cultivating, processing, and selling fish and other marine resources. The participants were selected using systematic random sampling from the official list of Ayoke Island fishers that the Municipal Agricultural Office provided. The sample size was calculated using the Cochran formula, which found that the study required a total of 117 participants. Ethical considerations of informed consent were followed during the data collection process.

2.3 Research instrument and analysis

For this study, a self-constructed survey questionnaire was used for the quantitative method. The first section of the instrument collected the sociodemographic variables for the individual and household. The second part investigated fishing behavior and employed a five-point Likert-type scale ranging from 1 'Never' to 5 'Always' for questions addressing economic ability, institutional support, enforcement, and socio-cultural variables. Quantitative data were analysed with descriptive statistics, Pearson product-moment correlation, and regression analyses to identify associations and significant predictors. In addition to this quantitative method, the qualitative method used focus-group discussions with six younger and older, male and female, higher- and lower-income fishers relative to their fishing income. In addition, key informant interviews were conducted with the TURF leaders, municipal agricultural office personnel, and NGO leaders. These provided contextual data to supplement the interpretation of the quantitative findings, and they were analysed by thematic analysis to further explore the issues affecting fishing behavior and the role of TURFs within the fisher communities.

Results and Discussions

3.1 Demographic Characteristics (Personal Attribute)

This section presents the results and findings of the study.

Table 1. Sociodemographic Characteristics of the Fishers (Personal Attribute)

Variable	**Frequency**	**Percent**
Sex		
Female	39	33
Male	78	67
Total	117	100
Age		
30 and below	46	39
31-40	34	29
41-50	26	22
51 and above	11	10
Total	117	100
Educational Attainment		
K-12	3	2
Elementary (E)	46	39
High School (H)	55	47
College (C)	13	12
Total	117	100
Years of Stay in the Barangay		
3-23	35	30
24-44	49	42
45-65	24	20
66-86	9	8
Total	117	100
Years of Fishing		
0-6	25	21
7-12	34	29
13-18	23	20
19-24	20	17
25-30	15	13
Total	117	100

Table 1 reports the fishers' sociodemographics (personal attributes) and details the fishers' characteristics. Fisherfolk who participate in the TURF program on Ayoke Island are predominantly male at 67% relative to females at 33%. Although women are primarily responsible for processing and selling marine products, the fishing profession is male-dominated. Fishers' ages are diverse, with those aged between 18 and 27 and those aged between 28 and 42 making up more than 50% of the sample, indicating that younger generations are beginning to take up the profession. The island has harsh waves and offers surfing, contributing to higher exposure for locals to the elements, leading to increased uptake by youth. Education levels also vary, with 47% having completed secondary school and 39% having completed primary school. The availability of secondary school on the island is limited, and students have to take a boat to school once a week. The number of years fishers have lived on the island also varies, though most have lived on the island between 24 and 44 years, indicating place attachment to the island. The number of years the fishers have fished also varies widely, with no one category dominating. Such a finding suggests that both novice and experienced fishers participate in the fishing activities in the community. Overall, these sociodemographic trends highlight the composition of TURF participants and demonstrate factors that impact it.

3.2 Demographic Characteristics (Household Attribute)

Table 2. Sociodemographic Characteristics of the Fishers (Household Attributes)

No. of Household Members	Frequency	Percent
0-2	19	16
3-5	74	64
6-8	23	20
Total	117	100
No. of Presently Working		
0-2	53	45
3-5	44	38
6-8	20	27
Total	117	100
Number of working as a Fisher		
0-0	6	5
1-1	61	52
2-2	35	30
3-3	15	13
Total	117	100
Estimated Annual Income		
0-30K	59	50
31K-60K	34	29
61K-90K	21	18
91K-120K	3	3
Total	117	100
Estimated Annual Expenses		
0-30K	74	63
31K-60K	29	25
61K-90K	10	9
91K-120K	4	3
Total	117	100

Table 2 shows the sociodemographic factors (household attributes) of fishers on Ayoke Island, exhibiting moderately sized households and economically dependent households. Households contain, on average, three to five members (64%), and 45% of households have no more than two earners, limiting the economic potential of the household. 52% of households have one included in earnings, but only 13% of households have three included fishers, showing a reliance on a small number of earning members. These observations are confirmed with annual income, with 50% of households earning 30,000 pesos or less and 63% spending this amount each year. These observations highlight that although fishing is the main source of income, households scrape by, allowing for little economic margin for making the household TURF system an economic investment for the long term. Therefore, once again, the successful implementation of the TURF cannot overlook these economic observations. Although implementing the system on household islands should still be the top priority through institutional oversight and enforcement, economic opportunity and educational opportunities should be added to the next phase of development. By satisfying these needs, people can participate economically freely in the fisheries and not feel economic pressure to avoid the systems, making them more successful (Davis, 2015; Villena et al., 2005).

3.3 Fishing Practices

Table 3. Fishing Practices: Compliance with Registration

Variable	Question	Weighted Mean	Interpretation
CWR1	I fish in the regulated area in the TURF.	2.62	Often
CWR2	I have a valid registration to fish in the regulated area of TURF.	3.11	Often
CWR3	I register my catch with the TURF.	2.73	Often
CWR4	I register my fishing equipment and gear.	2.90	Often
Mean		2.84	Often

Table 3 shows descriptive statistics for TURF registration and compliance. The overall level of compliance is significantly high (overall composite mean = 2.84). Compliance is highest for area registrations (mean = 3.11), then catch (mean = 2.73) and area (mean = 2.62) registrations. Thus, these findings indicate that fishers are typically aware of and compliant with at least the most significant oversight elements of the TURF, yet improvements are still desired (or even necessary) for compliance regarding the consistency of reporting and in the proper application of the use of the designated areas. Such relatively high levels of participation in gear and equipment registration (mean = 2.90), moreover, could suggest not only increased awareness of the accountability that the TURF program is intended to foster in association with responsible practices, but potentially that this awareness is driving the registration behaviors in the first place. Thus, these findings both indicate a promising level of knowledge of the program and its requirements while also indicating the necessity for additional outreach and learning opportunities to ensure compliance with and registration for all elements of TURF governance.

Table 4. Fishing Practices: Non-Practice of Illegal Fishing

Variable	Question	Weighted Mean	Interpretation
NPOIF5	I fish for prohibited species.	2.19	Seldom
NPOIF6	I use dynamite to fish.	1.32	Seldom
NPOIF7	I have used “tubli”(poison vine) to fish.	2.21	Seldom
NPOIF8	I have used chlorine in fishing.	2.11	Seldom
NPOIF9	I have used tear gas in fishing.	2.11	Seldom
NPOIF10	I have used “bituon” (fish poison tree) to catch fish.	2.10	Seldom
NPOIF11	I fish in closed areas.	2.10	Seldom
NPOIF12	I fish during the closed season.	2.07	Seldom
NPOIF13	I use explosives in fishing.	1.92	Seldom
NPOIF14	I use batteries for fishing.	1.85	Seldom
Mean		2.00	Seldom

Table 4 presents the extent of non-practice of illegal fishing in Ayoke Island fishers. Its analysis yields weighted means of less frequent use of illegal means such as dynamite, chlorine, tear gas, or explosives that show "seldom" within the scale. This depiction of the fishers' compliance with the regulation is successful since coastal resource management is to sustain the livelihoods of local fishers. The success of the TURFs depends on stakeholder engagement, especially from Ayoke Island fishers. As Franco-Melendez (2021) elaborated, social aspects inform the effectiveness of the TURFs, hence achieving a 61.3% "high" rating due to social interaction, instead of ranking "medium" for sustainability due to interactions for sustainability. An examination of differences in MEABR members and non-members shows many differences due to access to the program for members over a decade, as increased fish catches and biomass are also statistically significant (Romero, 2021). These various advantages reveal why engagement and community participation are vital because a well-implemented TURF and co-management schemes enhance the ecological systems and fishermen receive better livelihoods from the benefits of marine reserves (Cinner et al., 2014).

Table 5. Fishing Practices: Fishing Gear

Variable	Question	Weighted Mean	Interpretation

In fishing for marine resources, I use:			
FG1	Ondaw (hook and line)	2.29	Seldom
FG2	pana (spear)	2.32	Seldom
FG3	paw (floater)	2.02	Seldom
FG4	Bingwit (single hook-and-line)	1.68	Seldom
FG5	Palangri (multiple hook-and-line)	1.54	Seldom
FG6	Wakay (drifted single hook-and-line)	1.71	Seldom
FG7	Pukot pang Nokos (gill net for squid)	1.62	Seldom
FG8	Pukot Pamanagan (gill net for lobster)	1.68	Seldom
FG9	Pukot Palagod (drift gill net)	1.77	Seldom
FG10	Kayongkong ug Uyang-uyang (Jiggers)	2.17	Seldom
FG11	Pana na may suga (spearfishing with a gas lamp Petromax)	1.75	Seldom
FG12	(-)triple net	0.99	Never
FG13	(-)compressor	0.98	Never
FG14	(-)Superlight	1.02	Never
FG15	(-)Troll line	1.03	Never
Mean		1.70	Seldom

Table 5 reveals that fishers on Ayoke Island practice selective use of traditional and permitted fishing gear with an overall weighted mean of 1.70, or "Seldom". The use of allowed gear, like ondaw (hook and line) and pana (spear), is only slightly above "Seldom", while prohibited methods like the use of triple nets, compressors, superlight, and troll lines return around or below values of 1.03, or "Never". The latter two suggest strong compliance with TURF rules and avoidance of environmentally damaging practices. The use of traditional gear may suggest fisher compliance with the regulations or limitations in the ability to access modern gear, but it may also reflect the accepted culturally permissible fishing practices that Ayoke Island fishers use. These trends support the features of the previous sections that elaborate on how regulatory presence, community norms, and practical knowledge of those norms may maximize the extent of legal fishing according to TURF regulations.

3.4 Perceived Influence of Economic Capability (Adaptation)

Table 6. Perception of the fishers on the influence of Economic Capability (Adaptation) on their fishing practices

Variable	Question	Weighted Mean	Interpretation
EC1	My income from fishing is enough to support my family.	2.32	Seldom
EC2	I do not need to work other jobs to support my family.	1.89	Seldom
EC3	My income from fishing is regular and stable.	1.88	Seldom
EC4	I do not have to borrow money to support my family.	2.31	Seldom
EC5	My family (wife, children, family members) does not have to work to help me support the family's expenses because my fishing income is enough.	1.69	Seldom
EC6	I do not have any existing loans.	2.16	Seldom
EC7	I have enough money saved up in the bank.	1.22	Never
EC8	I can support my family (send my children to school and buy food for the family) with my income from fishing.	2.32	Seldom
EC9	I sell my catch.	3.15	Often
EC10	My family helps me sell my catch.	3.07	Often

EC11	The middlemen are fair with their demands on the type and price of catch.	3.13	Often
Mean		2.25	Seldom

Table 6 presents Fisher's economic capability in the TURF programme on Ayoke Island, averaging 2.25, thus they were economically constrained. Economic capacity is reflected in the indices of income sufficiency, savings, and fishery extraction. The fishers were unable to make a living by fishing alone to provide the livelihood needs of their family, and so had to depend on finding alternative sources of income, borrowing, and relying on the goodwill of relatives, particularly the latter for any financial transaction. The sale of the catch, support from family members, and fair treatment by market intermediaries compensated for some of the shortfalls. According to Talcott Parsons' AGIL model of the social system, the Adaptation function is weak, showing limited adaptation to external economic demands. TURFs have been established to improve the economic viability of small-scale fisheries, yet not enough progress has been made, although territorial rights remain a useful resource (Quynh et al, 2017). Evidence from Japanese and Chilean fisheries identified sociodemographic variables, self-interest incentives, and market-based mechanisms as vital for fishery management and livelihoods (Uchida, 2017; Arias et al., 2023). Expanding TURF programmes and market-based incentives may strengthen economic arrangements, lessen the need to rely on loans, and promote the sustainability of community-based fisheries (Adhuri et al., 2016).

3.5 Perceived Influence of Enforcement Factor (Goal Attainment)

Table 7. Perception of the fishers on the influence of the Enforcement Factor (Goal Attainment) on their fishing practices

Variable	Question	Weighted Mean	Interpretation
IF1	I see enforcement officers patrolling the waters on Ayoke Island regularly.	3.24	Often
IF2	I am aware of the TURF regulations.	4.31	Always
IF3	I know the close-open seasons in our TURF.	4.44	Always
IF4	I am aware of the boundaries established by the TURF for safeguarding purposes.	4.33	Always
IF5	I know the allowed and prohibited fishing gear in our TURF.	4.67	Always
IF6	I know the allowed amount of catch in the TURF.	4.71	Always
IF7	Fishing violators are fined in our municipality.	4.66	Always
IF8	Illegal fishing gear is confiscated once caught.	4.60	Always
IF9	I know someone who is imprisoned due to illegal fishing.	4.02	Frequently
IF10	The marine life wardens rigorously enforce the regulations.	4.30	Always
IF11	I see enforcement officers patrolling the waters on Ayoke Island regularly.	3.24	Often
IF12	I am aware of the TURF regulations.	4.31	Always
IF13	I know the close-open seasons in our TURF.	4.44	Always
IF14	I know the boundaries set by the TURF for protection.	4.33	Always
IF15	I know the allowed and prohibited fishing gear in our TURF.	4.67	Always
IF16	I know the allowed amount of catch in the TURF.	4.71	Always
IF17	Fishing violators are fined in our municipality.	4.66	Always
IF18	Illegal fishing gear is confiscated once caught.	4.60	Always
IF19	The fish wardens rigorously enforce regulations, particularly during closed seasons.	4.30	Always
Mean		4.07	Frequently

Table 7 indicates that fishers on Ayoke Island identify enforcement of the TURF program to be relatively strong; however, there are gaps in knowledge concerning prohibited gear, permitted catch, and penalties. This highlights a distinct difference between the legal enforcement of the program and the behavioral compliance with the program. Cerda (2022) names non-compliance, illegal practice, and limited ecological knowledge as reasons to attribute TURF failures, emphasising that enforcement must be accompanied by education to have a lasting impact. Using Talcott Parsons' AGIL model in a way that relates to Goal Attainment shows the model is failing because of poor communication and a lack of cohesion between islanders, which could potentially limit their shared goals. Evidence from Ayoke Island demonstrates that enforcement is ineffective without continuity, community engagement, and explanations of the rules. Patrols are meaningless if fishers do not know the rules or believe in the penalties. Economic considerations can also contribute to engagement because those under financial pressure may be less likely to support TURF programs unless sustainable options are created Villena et al., 2005; Davis, 2015). To ensure compliance, one must not only make operational changes but also provide financial solutions and build trust to properly engage the community and protect the fisheries.

3.6 Perceived Influence of Institutional Support (Integration)

Table 8. Perception of the fishers on the influence of Institutional Support (Integration) on their fishing practices

Variable	Question	Weighted Mean	Interpretation
IF1	There is a decent road available to help me better sell my catch.	2.74	Often
IF2	There is a funding organization that will help me obtain a loan to buy new fishing equipment.	1.74	Seldom
IF3	We have regular meetings in our TURF to give us updates.	2.60	Often
IF4	We can communicate our problems and concerns to our TURF leaders.	2.81	Often
IF5	Our TURF leaders work well with our barangay captains and councilors.	2.82	Often
IF6	We have regular skills training in our TURF to help us improve our catch.	2.73	Often
IF7	Our TURF regularly asks us about new ideas to improve our TURF.	2.47	Seldom
IF8	Our TURF helps me sell my catch.	2.62	Often
IF9	I am aware of the TURF regulations.	2.89	Often
IF10	I know the close-open seasons in our TURF.	3.44	Often
IF11	I know the boundaries set by the TURF for protection.	3.44	Often
IF12	I know the allowed and prohibited fishing gear in our TURF.	3.51	Often
IF13	I know the allowed amount of catch in the TURF.	3.13	Often
IF14	Our TURF does a good job of informing us of new policies.	3.12	Often
IF15	The LGU is sincere in the conservation of marine resources.	3.58	Frequently
Mean		2.91	Often

Table 8 indicates that fishers on Ayoke Island perceive institutional support to be moderate to high (mean 2.91). This includes enforcement officers surveying the area, financial assistance in loans, fishers attending community meetings and receiving training, and encouraging resource conservation, indicative of a stakeholder interest in actively participating. Applying Talcott Parsons' AGIL component, this pertains to the Integration function, ensuring the system remains cohesive and directs the interplay between its parts. Institutional support on Ayoke Island maintains the social cohesion of fishers, local leaders, and enforcement officers, allowing them to remain a cohesive unit. The evidence from Asia–Pacific countries shows that support rooted in culture and governments significantly influences public administration conduct and policy implementation (Chen, Kim & Ma, 2023). Fishers from Japanese and Chilean fisheries relate similar experiences in which cooperatives reinforce the incentive compatibility of community objectives for future resource use. Strengthening cooperative governance and actively engaging local government enhances transparency and accountability and positions a shared responsibility and vision using institutional arrangements as a foundation for effective fisheries management results (Wilen et al., 2012; Oyanedel et al., 2018; Quynh et al., 2020).

3.7 Perceived Influence of Sociocultural Influence (Latency)

Table 9. Perception of the fishers on the influence of the Sociocultural Influence (Latency) on their fishing practices

Variable	Question	Weighted Mean	Interpretation
SCI1	My family influences my fishing practices.	2.47	Seldom
SCI2	My friends in the MPA influence my fishing practices.	2.00	Seldom
SCI3	My faith in God influences my fishing practices.	2.76	Often
SCI4	I have strong support from my family when I fish.	3.18	Often
SCI5	I have good and loyal friends who help me abide by TURF regulations.	3.33	Often
SCI6	I believe the TURF is looking out for my welfare and that of my family.	2.62	Often
SCI7	I follow the regulations set forth by the TURF.	3.26	Often
SCI8	I do not see or know of anyone in the TURF who does not follow the TURF	2.12	Seldom
SCI9	I have never been fined before because of fishing.	2.21	Seldom
SCI10	I have never been in trouble with the law.	2.67	Often
SCI11	I am responsible for getting others to be involved in my TURF.	3.02	Often
SCI12	Our community is not tolerant of illegal fishing.	3.20	Often
SCI13	Our community has strong support for TURF regulations.	3.55	Frequently
SCI14	Our neighbors report to the authorities when they see illegal fishers.	2.99	Often
SCI15	Our community believes in the goals of TURF.	3.43	Often
Mean		2.85	Often

Table 9 presents a mean score of 2.85 for sociocultural influence, indicating that the fisherfolk's behavior and compliance under the TURF programme on Ayoke Island are significantly affected by sociocultural variables. Family, friends, spirituality, and community networks promote compliance with the programme's rules and reporting on individuals who break the law. As with findings within the Bugis and Makassar communities in South Sulawesi, local narratives and oral traditions significantly influence sociocultural behaviour and memory (Druce, 2016). On Ayoke Island, traditional values and relationships continue to promote fisherfolk's compliance with TURF restrictions, even in the absence of strong institutional or economic pressures. Within Parsons' AGIL framework, this pertains to the Latency (Pattern Maintenance) function, which is concerned with the maintenance of behaviours and values needed for stability within the system. Latency factors will ensure that cooperative behaviour remains, and the resource management scheme will continue to prosper. This is affirmed in anthropological research that recognises the need for understanding such factors in its quest to understand cultural factors in communal fisheries management (Macknight, 2016). The institutional application of the TURF designation contributes to the fisherfolk's participation in this scheme. Yet, it is these internalized sociocultural norms that underlie such a process. However, these factors may also be affected by globalisation, gender inequalities, and marginalization in policymaking. Hence, a strategy is required to make this community-based coastal resource management project a success (Stevens et al., 2015; Pelage et al., 2023).

3.8 Correlation Coefficients Between Factors

Table 10. Distribution of Correlation Coefficients Between Factors of Interaction and Fishing Practices

	Correlation Coefficient	P-Value	Direction and Strength of Relation
Economic Capability	0.567	0.000	Directly and positively related
Enforcement Factor	0.349	0.000	Directly and positively related
Institutional Support	0.509	0.000	Directly and positively related
Sociocultural Influence	0.648	0.000	Directly and positively related

Table 10 summarises the variables that significantly correlate with fishing practices on Ayoke Island. Economic capability shows a strong positive correlation ($r = 0.567$, $p < 0.001$), demonstrating that the availability of economic resources directly correlates with the increased effectiveness of fishing practices in the regulated area. Institutional support shows the same finding with a strong positive correlation ($r = 0.509$, $p < 0.001$), demonstrating the role of governance, training, and community programmes in strengthening regulation adherence. Sociocultural Influence shows the strongest correlation of all variables ($r = 0.648$, $p < 0.001$), demonstrating the impact that family, community networks, and cultural expectations have on the effectiveness of fishing practices. The enforcement factor also shows a moderate positive correlation ($r = 0.349$, $p < 0.001$), demonstrating how regulatory presence and adherence can lead to the increased effectiveness of regulated fishing practices. All of these variables show that they have been significantly impacted by fishing practices in Ayoke Island under the TURF regulation and that each variable plays a vital role in increasing regulation adherence and the effectiveness of these practices for the sustainability of the community-managed fisheries in the future.

3.9 Factors that significantly influence good fishing practices

Table 11. Factors that significantly influence good fishing practices in the area.

Predictor	Coefficient (Coef)	Standard Error (SE Coef)	T-Value (T)	P-Value (P)
Constant	0.7291	0.4399	1.66	0.100
Age	0.001374	0.005619	0.24	0.807
Educational Attainment	0.1331	0.1279	1.04	0.300
Gender	-0.1946	0.1487	-1.31	0.193
Years of Fishing	-0.01355	0.01092	-1.24	0.217
Years of Stay in the Brgy.	-0.001209	0.009587	-0.13	0.900
Economic Capability	0.61717	0.09818	6.29	0.000
Institutional Support	0.45758	0.07207	6.35	0.000
Sociocultural Influence	0.8241	0.1031	7.99	0.000
Enforcement Factor	0.30556	0.7652	3.99	0.000

Model Summary: S: 0.7318, R-Squared (R-Sq): 61.3%, Adjusted R-Squared (R-Sq(adj): 59.2%

In summary, Table 11 shows the main predictors of good fishing practices on Ayoke Island. Economic capability, institutional support, enforcement factor, and sociocultural influence are the most significant predictors of good fishing practices. The results highlight the importance of resource availability, institutional arrangements, local culture, and strong enforcement in promoting good practices. The non-significant effect of demographic variables, such as age, education level, gender, and years living on the island, shows that fishing practices are less about demographics and more about socioeconomic, cultural, and enforcement capacity. The model explains 61.3% of the variance in good fishing practices ($R^2 = 0.613$) with an adjusted value of 0.592, indicating that the model robustly explains these practices. These findings illustrate how sustainable fisheries management must include strengthening institutional, socioeconomic, and cultural support and enforcement capacity. Therefore, these findings significantly contribute to the management and preservation of marine resources so these critical ecosystems can continue to provide for local fishers in the years to come.

Conclusions

The results and discussion of the TURF study show that sustainable coastal resource management on Ayoke Island emerges from the interplay of the fishers' economic circumstances, institutions, enforcement, and sociocultural features. Based on Talcott Parsons' Social Systems Theory and its AGIL paradigm, the TURF programme can be conceptualised as a social system where Adaptation equals economic capacity, Goal Attainment equals enforcement, Integration equals institution support, and Latency or pattern maintenance is the sociocultural dimension. For effective coastal resource management, these subsystems must interact with each other to maintain the system's equilibrium. While local views on enforcement and institutional support are favourable, economic constraints and lack of policy awareness prevent optimal compliance and participation. Economic demands are lessened by the strong community ties the fishers have with each other, and common norms in the community influence the development of responsible fishing practices. Thus, the study demonstrates how the interconnected functioning of these four subsystems contributes to the social cohesion and ecological resilience of Ayoke Island's coastal fisheries management's social-ecological system.

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