RESEARCH ARTICLE

Gender Participation in the Capture and Marketing Sectors of the Glass Eel Fisheries in Aparri, Cagayan, Philippines

Leon A. Antonio, Jr[1,2*], Evelyn C. Ame[2], Emma L. Ballad[2], Marites Ramos-Castro[1], Isagani P. Angeles Jr.[1], Maryjoy Libatique-Asprec[1]

[1] *Provincial Institute of Fisheries-Isabela State University-Roxas Campus, Roxas, Isabela*
[2] *DA-Bureau of Fisheries and Aquatic Resources Region 02 Government Center, Carig, Tuguegarao City, Philippines*

ABSTRACT

The contribution of women in the fisheries sector is often underappreciated and under-valued because fisheries have long been considered a male-dominated sector. Studies have shown, however, that countries that value women's involvement in this sector have reached high levels of economic growth and social well-being. Thus, the present study assessed the women's participation in the capture and marketing sectors of the glass eel fisheries in the five coastal villages surrounding the mouth of Cagayan River in Aparri, Cagayan, Philippines. A household interview and a small group discussion were conducted to gather relevant and in-depth data on the different aspects like socioeconomic status, present roles, activities, responsibilities, access to and control over resources, and problems and constraints of both genders in the study area. Results have shown that out of the 146 respondents consisting of glass eel gatherers and consolidators, 95% are men and only 5% are women. The results showed that women have the ability to complement the family's monthly income. However, they were limited by their reproductive roles and domestic responsibilities. Their engagement in the fishing sector is focused more on the pre- and post-harvest activities. Both sexes have equal access to productive resources, but men control the majority of them. Increasing the involvement of women in the formulation of policies and programs towards the management of available natural resources will lead to increased development and empowerment.

*Corresponding Author: *antonioleonjr88@gmail.com*
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1. INTRODUCTION

The fisheries sector has long been considered a male domain, signifying a sense of adventure and risk valued by men but from which women are often excluded (The WorldFish Center 2010). Women play a significant role in the fisheries world (Bennett 2005); however, their contributions to the sector are often overlooked, under-estimated, and under-valued (Mutia et al. 2020). Leendertse (1990) revealed that women are being marginalized in the fisheries sector and their involvement is limited to small-scale.

Gender inequality has been existing in the fisheries sector for many years. In particular, Harper et al. (2013) stated that women are restricted in resource access and decision-making (Thorpe et al. 2014). However, there is already increasing evidence that countries that have performed well towards achieving gender equity have also reached higher levels of economic growth and social well-being in general (World Economic Forum 2008). Women have a significant involvement in the industry, and their participation is focused on facilitating the smooth flow of the fisheries' value chains. They are engaged in the pre- and post-harvest subsistence tasks and in household management which offers support in the fishing activities of men (Walker 2001).

Different genders play different roles in fishing communities around the world. Failure to engage women in management efforts could lead to the loss of opportunities to improve conservation practices and ensure secure, viable livelihoods (Matthews et al. 2012). Porter (2006) added that lower

labor productivity within the sector and inefficient allocation of labor at household and national levels could also result from gender disparities in the fisheries sector. Issues on gender concerns can only be identified and addressed by looking at the various gender stereotypes and identifying the roles of both genders in the fishery sector (Medard et al. 2002). These gender issues are also observed in the Cagayan Valley region of the Philippines, particularly in Aparri, Cagayan, where women play significant roles in the glass eel fisheries, but their participation is often left unrecognized.

Previous studies have shown that the glass eel and elvers of the catadromous tropical eels migrate up the Cagayan River and continue their life cycle upstream (Yoshinaga et al. 2014). The proximity of the municipality of Aparri to the river makes it one of the major glass eel collection sites not just in the province of Cagayan (DA-NFRDI 2022) but in the whole country as well (Tabeta et al. 1976; Ame et al. 2013; Yoshinaga et al. 2014; Aoyama et al. 2015). The roles of women in the glass eel fisheries are very important but are not significantly recognized and valued. Thus, the present study aimed to assess the level of gender participation in the capture and marketing sectors of glass eel fisheries in Aparri Cagayan, and recommends measures on how to improve the lives of the fisherfolk in the industry. Specifically, it aimed to describe the socioeconomic profile of the fisherfolk involved in the capture and marketing sectors of the glass eel fisheries in Aparri, Cagayan; determine the roles of both genders involved in the glass eel fishery and marketing; determine the awareness level of both genders on access and control to resources, and formulate policy recommendations that will promote gender participation and equitability in the access to glass eel resources in Aparri, Cagayan.

2. MATERIALS AND METHODS

The study was conducted in five coastal villages of Aparri, namely Bisagu, Macanaya, Punta, Sanja, and Toran (Figure 1). These villages were considered due to the presence of active glass eel gatherers and consolidators in the area. The municipality of Aparri is located on the northernmost tip of the island of Luzon, where the delta at the mouth of the Cagayan River is an estuarine area where the water from the country's longest river system and the seawater from the Babuyan Channel meets.

Data collection and presentation were based on the Harvard Analytical Framework or Gender Roles Framework developed by researchers at the Harvard Institute for International Development in the USA, published in 1985 (Srinivas 2015). This was one of the first frameworks designed for gender analysis and focused principally on the division of labor and the activities and roles of both genders. This framework aims to determine and differentiate the work and resources of both men and women (March et al. 1999). Its four main components include the activity profile answering the question "who does what?", access and control profile identifying the resources used to carry out the work identified in the activity profile,

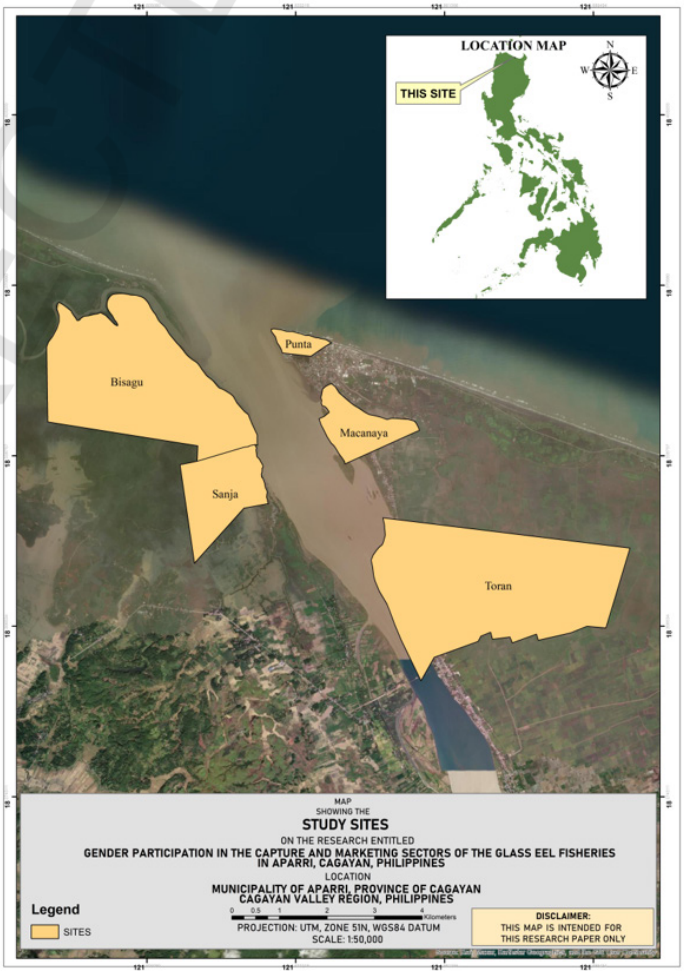

Figure 1. Map showing the study sites.

influencing factors on gender differences, and project cycle analysis examining the intervention of gender-disaggregated information.

Data were obtained from the interview of household members using a semi-structured questionnaire modified from Mutia et al. (2020). The survey questionnaire was divided into several sections: Socio-Economic Profile, Gender Roles, Productive Roles, Access to Productive Roles, Access and Control Over Resources, and Policy Recommendations.

The household survey provided relevant and in-depth data on the different aspects like socioeconomic status, present roles, activities, responsibilities, access to and control over resources, and problems and constraints of both genders in the study areas. The Small Group Discussion helped collect more detailed background information and expert insights into the current state of the municipality's glass eel capture and marketing sectors.

There were 597 glass eel gatherers within the municipality recorded by the Municipal Agriculture Office (MAO) of Aparri and the Zoological Society of London in the year 2013-2015, comprising 88% men and 12% women (Gollock et al. 2017, unpublished). However, the study of Tattao et al. (2023) confirmed that only approximately 200 are considered active. The Cochran online sample size determination method was employed at a 95% confidence level with a 5% margin of error and 5% precision to determine the sample size following the population size from the study of Tattoo et al. (2023) since there were no data recorded from the office of the MAO at present. Project respondents were chosen based on the level of their participation in glass eel fishery and marketing. Data from survey questionnaires were encoded and entered into a database system using Microsoft Excel software. Descriptive statistics such as mean, frequency distribution, and percentages were used to describe the variables using the Statistical Analysis in Social Science (SPSS) software version 27.

3. RESULTS

A total of 146 respondents were interviewed from the five (5) villages in the municipality of Aparri, particularly Toran, Sanja, Bisagu, Macanaya, and Punta. The respondents were chosen based on their participation in glass eel fishing and marketing, consisting of 141 gatherers and five consolidators. The sample consisted of 95% men and 5% women (Table 1).

3.1 Socioeconomic profile

The socioeconomic characteristics of the glass eel fishers and consolidators are presented in Table 1. Male respondents constituted 95%, while females constituted 5%. This shows that glass eel fishery and marketing are male-dominated in Aparri, Cagayan.

The majority (26.7%) of the respondents belonged to the 31–40 and 41–50 age groups, with a mean age of 45.5 years old for the eel gatherers and 46.6 years old for the consolidators (Table 2). Respondents

Table 1. Number of respondents by sector in Aparri, Cagayan.

Villages	Gender	RESPONDENTS (n = 146)			
		Gatherers (n = 141)		**Consolidators** (n = 5)	
		Frequency	Percentage (%)	Frequency	Percentage (%)
Toran	Men	35	24.0	0	0
	Women	0	0	1	0.7
Sanja	Men	42	28.8	2	1.4
	Women	3	2.1	0	0
Bisagu	Men	3	2.1	0	0
	Women	2	1.4	0	0
Macanaya	Men	30	20.5	0	0
	Women	0	0	0	0
Punta	Men	26	17.8	1	0.7
	Women	0	0	1	0.7
TOTAL		**141**		5	
	Men	136	93.1	3	2.1
	Women	5	3.4	2	1.4

Table 2. Demographic profile of the respondents.

Range	RESPONDENTS (n = 146)							
	Gatherer (n = 141)				Consolidator (n = 5)			
	Women (136)		Men (5)		Women (2)		Men (3)	
	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
Age								
21-30	0	0	14	9.6	0	0	0	0
31-40	1	0.7	37	25.3	1	0.7	0	0
41-50	1	0.7	36	24.6	0	0	2	1.4
51-60	3	2.1	31	21.2	1	0.7	2	1.4
61-70	0	0	15	10.3	0	0	0	0
>70	0	0	3	2.1	0	0	0	0
Civil Status								
Single	0	0	9	6.2	0	0	0	0
Married	4	2.8	117	80.1	1	0.7	3	2.1
Lived-in	1	0.7	6	4.1	1	0.7	0	0
Widowed	0	0	4	2.8	0	0	0	0
Educational Attainment								
Elementary	2	1.4	71	48.6	0	0	1	0.7
Secondary	3	2.1	49	33.6	1	0.7	1	0.7
Tertiary	0	0	14	9.6	1	0.7	1	0.7
Vocational	0	0	2	1.4	0	0	0	0
Never Attended School	0	0	0	0	0	0	0	0

from both sectors were mostly married (85.7%), while others were single (6.2%), living-in (5.5%), and widowed (2.8%). In terms of educational attainment, the majority of the gatherers have primary (50%) and secondary (35.7%) education (Table 2). Only 1.4% of them have reached tertiary levels. On the other hand, only 1.4% of the consolidators have reached secondary and tertiary levels and 0.7% primary level. These findings showed that education is accessible in the study sites.

Around 91.7% of the respondents from both the capture and marketing sectors have men as the head of the household (Table 3). Sixty-three percent have a household size of between 4–6 family members, and 93.8% of them have 1–3 family members engaged in glass eel fishing. As for the economic conditions of both sectors, the consolidators earned an average monthly income of PHP 46,800.00 compared to the meager income of the gatherers of just PHP 5,565.96 (Table 3).

3.2 Gender roles in fisheries

Gender roles as described by the International Labour Organization (2000) are activities attributed to women and men based on their perceived differences. These are socially determined, change over time and space, and are influenced by several aspects like social, cultural, and environmental factors characterizing a specific community, society, or historical period. It refers to both reproductive and productive roles.

3.2.1 Reproductive roles

The International Labour Organization (2000) refers to the reproductive roles as all activities necessary for the survival and maintenance of human life which include childbearing, looking after and educating children, cooking for food, washing clothes, or growing or foraging food for home use. Figure 2 shows that both men and women jointly served as primary providers (70.5%). Men on the other hand, are more responsible for decision-making (50%), while women are mostly responsible for budgeting (80.1%) and housekeeping (82.9%) within the family.

3.2.2 Productive roles

Mutia et al. (2020) defined productive roles as all activities related to the production of goods for

Table 3. Socioeconomic profile of the respondents.

Range	RESPONDENTS (n = 146)			
	Gatherers (n = 141)		Consolidators (n = 5)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Head of Household				
Men	130	89.0	4	2.7
Women	4	2.7	1	0.7
Both	7	4.8	0	0
Number of Family Members				
1-3	24	16.4	1	0.7
4-6	90	61.6	2	1.4
7-9	22	15.1	2	1.4
10-12	5	3.4	0	0
Number of Family Members Engaged in Fishing				
1-3	133	91.1	4	2.7
4-6	7	4.8	1	0.7
7-9	1	0.7	0	0
Income	Sector		Average monthly income (PHP)	
	Capture Sector		5,565.96	
	Marketing Sector		46,800.00	

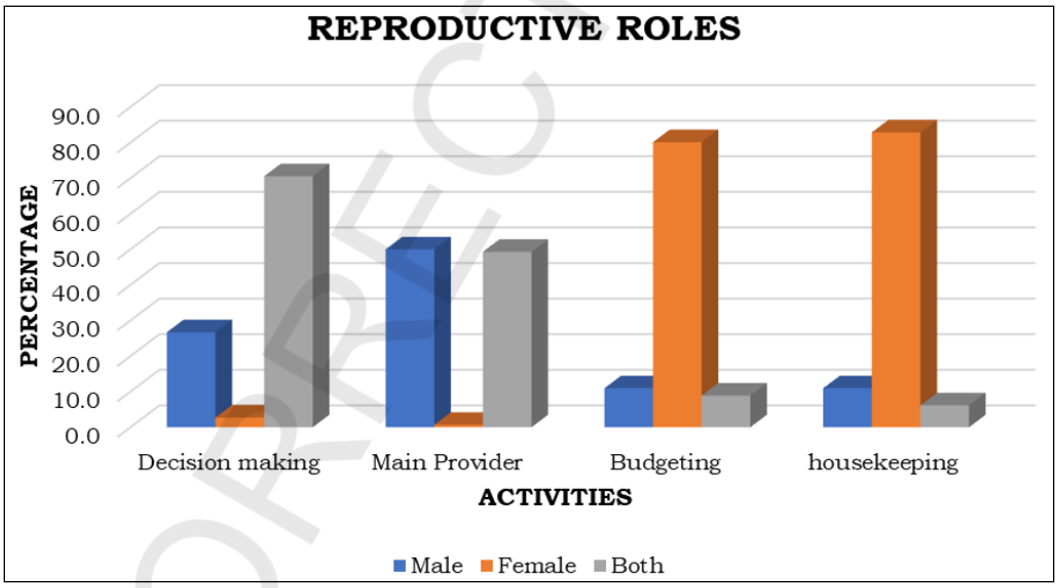

Figure 2. Reproductive roles of both genders in the glass eel fisheries in Aparri, Cagayan.

consumption or trade or income-generating activities, which include fishing, fish culturing, fish preserving and processing, marketing, and conserving and managing aquatic resources. In coastal communities where fishing is the main livelihood, there are clear roles for both genders of different ages and social statuses (Torel et al. 2020). They are involved in fisheries, but often in different activities (Harper et al. 2017). In the present study, the roles of both genders were categorized into two sectors: capture and marketing.

3.2.2.1 Capture fisheries

Fishing has been identified as a male-dominated occupation (Siason 2001) because of the laborious activities required during its operations. However, several studies presented the vital roles of

women in this sector. In Aparri, Cagayan, women engaged in the glass eel fishery play important roles in pre- and post-harvest activities, which offer additional family income. In the present study, most of the respondents (38.3%) are engaged in fishing activities for 11–20 years (36.9% male; 1.4% female) (Table 4), but the majority of them are nonboat owners (60.5%). Fyke net is the primary fishing gear used in catching glass eels, requiring at least 3–4 manpower implements during fishing operations (70.9%). Thus, glass eel gatherers operate in groups for ease of setting and hauling the nets. Most of the gatherers (92.2%) share their catches depending on the owner of the boat and the gear being used. Catches were divided into four parts (one for the boat, one for the gear, one for the engine and the rest will be shared by boat crews).

During the peak fishing season, most of the respondents (53.4%) spent 7–9 hours engaged in fishery activities catching an average of 569.3 grams of glass eels. Also, during this season, some male fishers (6.4%) can catch as much as 1,000 grams of glass eels, but the majority of them (46.8%) can only catch between 251–500 grams on average. However, during the lean months, the majority of the gatherers (78.9%) can only catch 151.53 grams of glass eels on average.

The mean daily profit for both genders is PHP 335.66, and the majority (96.4%) of the gatherers have a daily profit ranging from PHP 100–500. Both genders are responsible for the preparation of food and materials for fishing. The peak season for glass eel is observed during the months of August to February, while the lean season is from March to July. From September to December, the fishers observed an abundance of glass eels, but it was observed that fish caught during this period were weak due to increased water turbidity. Glass eels were solely sold to consolidators and stackers within the locality.

Aside from fishing as the main occupation, the respondents are also involved in different fisheries-related activities to supplement the household's needs (Table 5). Most of them are involved in the pre-fishing activities like gear or boat and food preparation, marketing activity like selling fishery products, and processing activities like drying, salting, and fermenting fish.

Table 4. Involvement of the respondents in the glass eel gathering

Range	GATHERERS (n = 141)			
	Men (n = 136)		Women (n = 5)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Length of involvement in fishing (years)				
0-10	19	13.5	0	0
11-20	52	36.9	2	1.4
21-30	29	20.6	2	1.4
31-40	23	16.3	1	0.7
41-50	9	6.4	0	0
51-60	4	2.8	0	0
Boat Ownership				
Boat owners	54	38.3	2	1.4
Non-boat owners	82	58.2	3	2.3
Number of crews				
1-2	33	23.4	0	0
3-4	96	68.1	4	2.8
5 and above	7	5.0	1	0.7
Sharing Scheme				
All	2	1.4	0	0
Equal Sharing	4	2.8	0	0
Depends on the boat/catch/gear owner	130	92.2	5	3.5
Number of hours of operation				
4-6	64	45.4	2	1.4
7-9	72	51.1	3	2.3

Continuation of Table 4. Involvement of the respondents in the glass eel gathering

Range	GATHERERS (n = 141)			
	Men (n = 136)		Women (n = 5)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Estimated volume of daily catch				
Peak Season (g)				
<250	25	17.7	0	0
251-500	64	45.4	2	1.4
501-750	36	25.5	2	1.4
751-1000	2	1.4	0	0
>1000	9	6.4	1	0.7
Lean Season (g)				
<250	108	76.6	3	2.3
251-500	27	19.1	2	1.4
501-750	1	0.7	0	0
>750	0	0	0	0
Buyers				
Consolidators	136	96.5	5	3.5
Profit (₱)				
100-500	132	93.6	4	2.8
501-1000	3	2.3	1	0.7
1001-1500	1	0.7	0	0
>1500	0	0	0	0
Preparation of materials and food for fishing				
Both	91	64.5	5	3.5
Women HH member	25	17.7	0	0
Men HH member	20	14.2	0	0

Table 5. Extra fisheries-related jobs of the glass eel gatherers

Extra fisheries-related activity	GATHERERS (n = 141)							
	Men (n = 136)				Women (n = 5)			
	Yes		No		Yes		No	
	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
Pre-fishing								
Gear/boat preparation	61	43.3	75	53.2	5	3.5	0	0
Food preparation	132	93.6	4	2.8	2	1.4	3	2.1
Marketing								
Selling of fishery products	61	43.3	75	53.2	2	1.4	3	2.1
Processing								
Drying	79	56.0	57	40.4	1	0.7	4	2.8
Salting	12	8.5	124	87.9	2	1.4	3	2.1
Fermentation	13	9.2	123	87.2	1	0.7	4	2.8

3.2.2.2 Marketing sectors

Both genders have been involved in the marketing of glass eels for an average of 13.6 years (40%) spending an average of 10.8 hours daily (80%) (Table 6). But the marketing sector has always been dominated by men (60%). During the peak glass eel fishing season, both genders can sell an average of 192,000 grams, while only an average of 34,000 grams are sold during the lean season.

3.2.3 Access to productive roles

Table 7 shows that only 8.2% of the respondents have 1–5 household members who belong to any organization. The majority of them (91.8%) do not belong to any local organizations in their community. Weeratunge et al. (2013) explain that membership in any formal organizations, such as fisheries associations or cooperatives, is more prevalent among men than women, but poor men can be excluded as well.

Twenty-one percent of the respondents from both sectors were noted to have loans or credits availed mostly by the women of the household, primarily from consolidators. Only 7.6% of the respondents received extension services from the government in the form of fuel subsidy, fiberglass reinforced plastic boats and fishing paraphernalia as part of the Department of Agriculture's Fuel Discount for Farmers and Fisherfolk and F/B Pagbabago Livelihood Programs.

3.2.4 Access and control over resources

"Access to" refers to right and opportunity, while "control over" refers to the power over productive resources (Mutia et al. 2020). Access to, use of, and control over productive resources are essential to ensuring the right to equality and an adequate standard of living (United Nations Women 2013). Table 8 shows that both men and women in the fishing and marketing sectors of the glass eel fisheries have access to and use of natural resources (land and water) and physical, social, and human capital, but men mostly have control over them.

Table 6. Involvement of men and women in glass eel consolidation

Range	CONSOLIDATORS (n = 5)			
	Men (n = 3)		Women (n = 2)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Length of involvement in glass eel trading				
0-10	1	20.0	1	20.0
11-20	2	40.0	0	0
21-30	0	0	1	20.0
Number of days spent in glass eel trading per week	23	16.3	1	0.7
Daily	3	60.0	2	40.0
Number of hours spent in eel trading per day	4	2.8	0	0
6-10	0	0	1	20.0
11-15	3	60.0	1	20.0
Product Destination				
Main Consolidator	1	20.0	0	0
Traders in Manila	2	40.0	1	20.0
Farms	0	0	1	20.0
Volume of glass eel sold (kg)	7	5.0	1	0.7
Peak Season (kg)				
<5000	1	20.0	0	0
25001-30000	1	20.0	1	20.0
>30000	1	20.0	1	20.0
Lean Season (g)				
<5000	1	20.0	1	20.0
25001-30000	1	20.0	0	0
>30000	1	20.0	1	20.0

Table 7. Access to financial and social services of the glass eel gatherers and consolidators

Membership to Organizations	RESPONDENTS (n = 146)			
	Men (n = 139)		Women (n = 7)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Number of HH members who are members of organizations				
1-5	10	6.8	2	1.4
None	129	88.4	5	3.4
Have loans or credits?				
Yes	30	20.5	1	0.7
No	109	74.7	6	4.1
For those who have loans, who usually avail loans in the family?				
Male	2	6.4	0	0
Female	17	54.8	1	3.2
Both	11	35.5	0	0
Received extension services?				
Yes	9	6.2	2	1.4
No	130	89.0	5	3.4
Type of extension services received				
Capital	7	63.6	1	9.0
Fishing Boats/Gears	5	45.5	0	0
Fuel Subsidy	9	81.8	2	18.2

Table 8. Summary of Access (A) and Control (C) over resources by men and women in the glass eel fisheries in Aparri, Cagayan.

RESOURCES	RESPONDENTS (n = 146)	
	Women (n = 7)	Men (n = 139)
Natural Resources		
Land Resources	A	AC
Water Resources	A	AC
Physical Capital		
Vehicle and Transportation	A	AC
Social Capital		
Membership in organizations	AC	AC
Human Capital		
Education	A	A

4. DISCUSSION

The present study found that the majority of glass eel fishers and consolidators in Aparri, Cagayan were men. This result is similar to the findings of Branch et al. (2002) in the subsistence and informal fishers in South Africa, of Weeratunge et al. (2011) in the Solomon Islands, and Mutia et al. (2020) in Lake Taal. Mutia et al. (2020) and Olowosegun et al. (2005) further stressed that women's engagement and participation in fishing can be credited to the fact that their husbands are fishermen.

The majority of the respondents in the present study are middle-aged adults who are responsible for providing the basic necessities of their households. This conforms to the findings of Olaoye (2010) in the states of Lagos and Ogun in Nigeria, wherein the majority of the fishers are in their ages considered to be economically active in order to undertake the arduous tasks associated with fishing. In Aparri, Cagayan, the reported average monthly income of the glass eel fishers was PHP 7,530.00 or PHP 90,360.00 annually. This was found to be lower than the national average annual family income of PHP 307,190.00 (Philippine Statistics Authority 2022). Tattao et al.

(2023) stressed that the household income of glass eel fishers in Aparri, Cagayan, can be affected by several factors, such as high climate change vulnerability of the eel fishery and mining activities, which limit their fishing capacity and eventually affect their income.

Women complement men in providing for the household. It was noted that women helped in the sorting of glass eels from the by-catch species caught by fyke net. This is similar to the findings of Mutia et al. (2020), where both genders are jointly serving the household as the primary providers and decision-makers. However, budgeting and housekeeping are exclusively done by women due to the laborious activities done by men, especially in fishing. These findings are supported by the work of Williams (2010) and Lentisco and Lee (2015), claiming that women serve as principal caregivers in households within small-scale fishing communities and are responsible for most domestic tasks, including cooking, cleaning, and childcare. They are also more responsible for providing food and nutrition security, taking care of other members of the family, and managing household finances.

Catches are divided into four parts: one for the boat, one for the gear, one for the engine, and the rest is divided among the boat crews. This is similar to the study of Mutia et al. (2020) in Lake Taal, where a 75:25 sharing scheme was practiced by the fishers, which means that 75% of the profit goes to the boat owner, and the remaining 25% goes to the fisher companion. In the preparation of food and materials for fishing, both genders responded that both men and women are responsible for the said activities, conforming with the findings of Walker (2001) that more commonly, women support men's fishing activities through their engagement in the pre- and post-harvest subsistence tasks and the household management while men are away at sea. The selling of catches to the local consolidators is due to the lack of access to traders in other areas due to transportation problems. Mutia et al. (2020) also obtained similar findings in Lake Taal, where the problem with transportation is the main reason the fisherfolks sell the products to the middlemen within the locality.

Both genders have limited access to financial capital due to fear of not being able to pay their loans and credits. The majority of those who availed are women. This conforms to the result of the study of Goetz and Sen Gupta (1994) and D'Espallier et al. (2011), wherein it found that women were found to be more responsible in having loans and credits since they have a higher capacity to pay back.

Both genders can access productive resources; however, mostly male respondents have control over almost all these resources. Arenas and Lentisco (2011) also proved that women have poorer access to resources and control over them than men. This is due to common notions that they are weaker to meet the physical demands of fishing, and their reproductive responsibilities commonly hinder them from being given equal access to resources with men. Siar (2003) also stated that the differences in access and control to resources are due to the unequal distribution of knowledge to both genders.

5. CONCLUSION

The glass eel fisheries in Aparri, Cagayan is open to both men and women; however, men dominate the use and control of the resource. Women's engagement in the fishing sector is focused more on pre- and post-harvest activities. They have the ability to complement the family's monthly income. However, a major limitation to women's contribution to fisheries is the unequal distribution of reproductive roles between men and women respondents brought by the need for women to remain within the household to attend to their domestic responsibilities. Both genders have access to productive resources. However, women have limited control over most of them.

6. RECOMMENDATIONS

Based on the results of this study, it is recommended that the government in cooperation with fisherfolk associations and non-government organizations to lead in organizing and capacitating cooperatives within the area to gain access to social services following the Harmonized Gender and Development Guidelines for Project Development, Implementation, Monitoring and Evaluation, capacitate men and women organizations on financial literacy, create linkages to lending institutions and development agencies, and ensure maximum access to other resources like educational and health care institutions, increase the involvement of women during the formulation of policies and programs towards the management of available natural resources that will lead them to increased development and empowerment, and conduct information dissemination to eel gatherers and consolidators on the current status of the glass eel in the area, involving both genders in crafting managements actions towards the conservation and management of the glass eel fisheries in Aparri, Cagayan.

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AUTHOR CONTRIBUTIONS

Antonio LA: Resources, Writing - Review and Editing, Methodology, Visualization and validation, Formal analysis. **Ame EC**: Conceptualization, Writing - Review and Editing, and Formal Analysis. ***Ballad EL:*** Conceptualization, Writing - Review and Editing, and Formal Analysis. **Ramos-Castro M**: Supervision, Validation, Writing - Review and Editing. **Angeles IP**: Supervision and Writing - Review and Editing. **Libatique-Asprec M**: Supervision and Writing - Review and Editing.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest in any way.

ETHICS STATEMENT

The authors obtained prior informed consent from all the participants included in this study.

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