



# Socio-economic Status and Fishing Practices among Boat Owners in Batticaloa District, Sri Lanka

Rukshan Calistus Croos <sup>a++</sup>, Naveenkumar Mahidha <sup>b#</sup>,  
Deepak Murugavel <sup>b#</sup>, Arumugam Muthuvel <sup>b†\*</sup>  
and Kanchana Shankar <sup>b‡</sup>

<sup>a</sup> Department of Fisheries, Ministry of Fisheries, Sri Lanka.

<sup>b</sup> Centre of Advanced Study in Marine Biology, Faculty of Marine Sciences, Annamalai University, Parangipettai – 608502, Tamil Nadu, India.

## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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## ABSTRACT

Residents of the Batticaloa region of Sri Lanka depend on marine fishing, a major livelihood source for individuals in villages and towns. A comprehensive survey was conducted to determine local boat owner's socioeconomic status and fishing operations. A detailed questionnaire was prepared

<sup>++</sup> Assistant Director;

<sup>#</sup> PhD in Coastal Aquaculture;

<sup>†</sup> Associate Professor;

<sup>‡</sup> Senior Research Fellow;

\*Corresponding author: Email: [arumnplab@gmail.com](mailto:arumnplab@gmail.com);

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and data were collected from 74 boat owners. The collected data was about the socio-economic status, fishing period, crafts, and gears to analyze the fishing operations of the study area. The collected data was used to determine demographic characteristics like age, marital status, and literacy. Also helps to evaluate the living standards, and access the basic amenities including that are employment, basic utilities, and appliances. To these data, the socio-economic impacts of fluctuating income among the fishing communities are evaluated. The present result described that 30% of the respondents were in the age group of 50 to 59 years and 95% of respondents were married. The literacy rate of the respondents was 95.9% for fishing boat owners. The fishing boat owners have houses with basic utilities and appliances. Electricity and water sources are available in 100% of respondents' houses. 97% of the respondent's houses have landline or mobile and motorized transport. 76.58% of respondents had difficulties getting the appliances to prepare food. Additionally, FAO policies and programs that in practice to promote & sustain the fishing activities and develop the economic condition of the fisherman are analyzed. This study revealed that the economic status of fishing boat owners fluctuated around the poverty line, secondary and low-level workers such as skippers, crew members, and others were heavily affected.

**Keywords:** Fisheries management; socioeconomic status; fishing communities; boat ownership; poverty alleviation; fishing operation.

## 1. INTRODUCTION

In the world, fishing is an important livelihood option for millions of people, they are engaged in fishing and fish trading over the years. Batticaloa is the oldest coastal district in Sri Lanka offering an important livelihood option for the dwellers of the coastal line since ancient times. It offers great opportunities for livelihood activities, particularly providing resources to the people such as fishing and tourism. 1.5% of the total fish production is obtained from one of the coastal areas of the Batticaloa district in the total fish production of the island of Sri Lanka (Jeyarajah et al., 2015), (Green Tech Consultants et al., 2009). Other than the marine resources estuaries and lagoons are also present in that region. The Batticaloa Lagoon is one of the largest estuarine lagoons and the largest coastal water body in the Batticaloa district. In that, 14.3% of the population depending fisheries for their income and it occupies an area of 168 km<sup>2</sup> and is 56 km long (Santharoban et al., 2005), (NARA et al., 2015), (Thayananth et al., 2008). Two bar mouths are connected to the Batticaloa lagoon, known as Palameenmadu and Kallar (Thayananth et al., 2008). In India, a study was conducted on "Socio-economic analysis of marine fishermen in India". In this study, different parameters such as family size, age structure, educational and occupational pattern, customs, beliefs, and the standard of living of the coastal fishermen household have been analyzed (Narayanakumar et al., 2000). A Similar study was conducted in the Digha coast, West Bengal in India about the Socioeconomic status of the fisherman community. The different parameters

studied in this study are Religion, Usage of medicine, Experience in fishing, income and its source, Sanitary facilities, Water facilities, Health facilities, Housing condition, Type of house, Ownership of the house, educational status, and age group (Tripathy et al., 2023). These studies are used as the major reference for this study.

In Sri Lanka, small-scale fishing is highly they are doing. The marine fisheries in Sri Lanka also depend on small-scale fishing. It is not only an important source of seafood for people but also a main social and economic contributor to the country (Azmi et al., 2020). Numerous challenges are faced by fishing boat owners in the Batticaloa that impact their socio-economic status. These challenges include environmental degradation, fluctuating fish stocks, and limited access to modern fishing technologies. In Addition, socioeconomic factors such as income levels, education, and access to financial resources in the livelihood of these fishing communities (Santhanam et al., 2012). The average income of the fishing boat owners in Batticaloa is often unstable and insufficient to meet their daily needs. Traditional fishing methods are also relied on by many fishermen, which are less efficient and lower catches than modern techniques (Udayanganie et al., 2021). The lack of infrastructure and support services creates a situation of economic vulnerabilities in these fishermen's communities (Kuganathan et al., 2021). The government must understand the socio-economic conditions and fishing operations of fishing boat owners as essential for developing effective policies and interventions aimed at improving their livelihoods.

This study aimed to provide a comprehensive analysis of the socio-economic profile and fishing operations of fishing boat owners in Batticaloa District, highlighting the key factors that influence their economic condition and fishing operations. It helps to address the problems faced by the fishermen and fishing boat owners due to low income and poverty. Additionally, the reason behind these issues can be identified by this study (Santhanam, V., 2012). The results can suggest the policy and developmental program implications to improve the economic conditions of the fishing communities. In addition, the fishing operation can be analyzed in detail via this study. It helps to propose skill programs to develop fishing and raise awareness of the fishing laws.

## 2. MATERIALS AND METHODS

### 2.1 Study Area

The data were collected from the fishing boat owners in the coastal villages and towns in the Batticaloa district in Sri Lanka. Batticaloa is one of the coastal districts in the Eastern part of Sri Lanka and occupies the Central Part of the Eastern Province. It covers a land area of approximately 2633.1 square Km and its geographical coordinates are 7° 43' 0" North, 81° 42' 0" East (Jeyarajah et al., 2015). The Batticaloa Lagoon is the third-largest estuary and

the highest-productive brackish water body on the East coast of Sri Lanka (Aruniya et al., 2024).

### 2.2 Data Collection and Statistical Analysis

The data were collected from different places in **Batticaloa District, Sri Lanka for three months (September to November) in 2023. A random sample of 74 fishing boat owners was studied.** The data from the respondents (fishing boat owners) was collected via the interview method (Tripathy et al., 2023). **They are from seven places with high fishing activities in the study area.** This study's respondents are limited to 7 places including fishing villages and towns in the Batticaloa District. The data analyzed in Microsoft Excel (Version 2021) uses simple statistical test methods to analyze and numerically tabulate the collected data (Tripathy et al., 2023). In particular, the data were stratified by descriptive analysis methods like Age group, religious status, marital status, Educational Status, and Literacy in the Language, Children's participation in business, education, and other economic activities are shown in graphical diagrams. After that Housing Conditions and Facilities, Basic Utilities/Appliances, Fishing Period, Investments in Gears and Craft, Revenue Sharing, and Operational Expenditure the percentage were calculated and displayed in the tables.

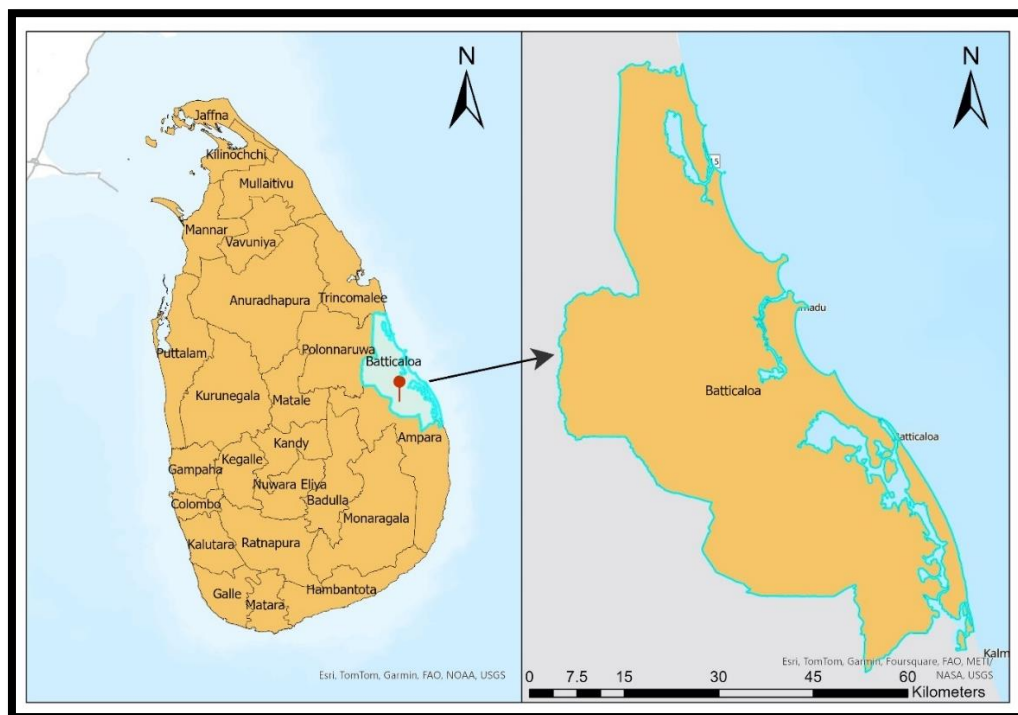


Fig. 1. Study Area map of Batticaloa district, Sri Lanka

Additionally, this study examined the FAO policies and programs practices in Batticaloa district, Sri Lanka to promote and sustain fishing activities while enhancing the economic conditions of fishermen.

### 3. RESULTS AND DISCUSSION

#### 3.1 Age Group

According to this study, the majority of fishing boat owners 38% belong to the age group 40-49 years, whereas 30% belong to the 50-59 years and 14% belong to the 30-39 years age group. Only 7% of fishing boat owners belong to the 20-29 age group and 5% are above the 60-69 age group. Also, 7% of boat owners who do not specify their age for some reason are graphically shown in Fig. 2. This data reflects that most fishing boat owners belong to the middle-aged group (Islam et al. 2017). Only 5% of the boat owners are highly aged 60-69 years and the very young age group is 20-29 years.

#### 3.2 Religious Status

The socioeconomic profile of fishing boat owners is associated with individuals' religious affiliations and practices (Akter et al., (2023). Muslim, Hindu, Buddhism, and Christianity are the religions that are followed in Sri Lanka. Of our respondents, 89.2% of fishing boat owners have been reported as Muslim and 10.8% reported Sri Lankan Tamil as graphically shown in Fig. 3. In

this study referred to Sri Lankan Tamils, not all are Hindus, it included Buddhism and Christianity. There is also a significant minority of people are follow Christianity (McGilvray et al., 2008).

#### 3.3 Marital Status

The marital status refers to the position of being married or unmarried. This study found that 94.6% are married and 5.4% are unmarried among the fishing boat owners is graphically shown in Fig. 4.

#### 3.4 Educational Status and Literacy in the Language

According to this study, fishing boat owners from the Batticaloa district of Sri Lanka show varying levels of education. Specifically, 48.6% of people studied up to Ordinary level (OL) in Tamil, 12.2% of people studied up to Advanced level (AL) in Tamil, 18.9% of boat owners studied up to grade 10, 5.4% of boat owners studied up to grade 9, another 5.4% of boat owners studied up to grade 8, 4.1% of boat owners studied up to grade 11, 1.4% of boat owners studied up to grade 5 and 4.1% have zero literacy in education shown in Fig. 5a. It revealed that the literacy rate of the respondents is 95.9% in respondents. The fishing boat owners and their families are 95% literate in Tamil and 5% in other regional languages, which is graphically shown in Fig. 5b.

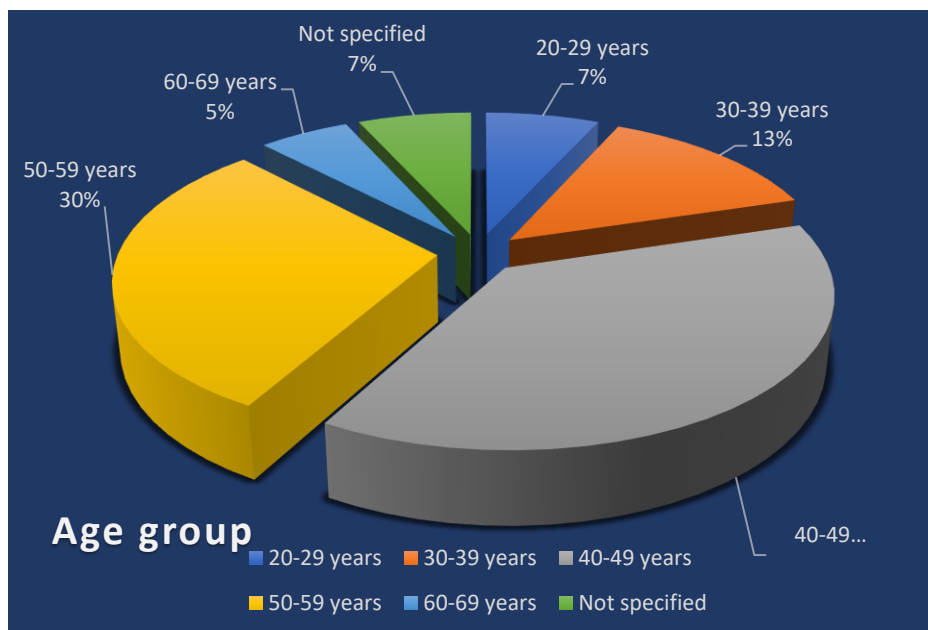


Fig. 2. Age distribution of fishing boat owners in Batticaloa, Sri Lanka

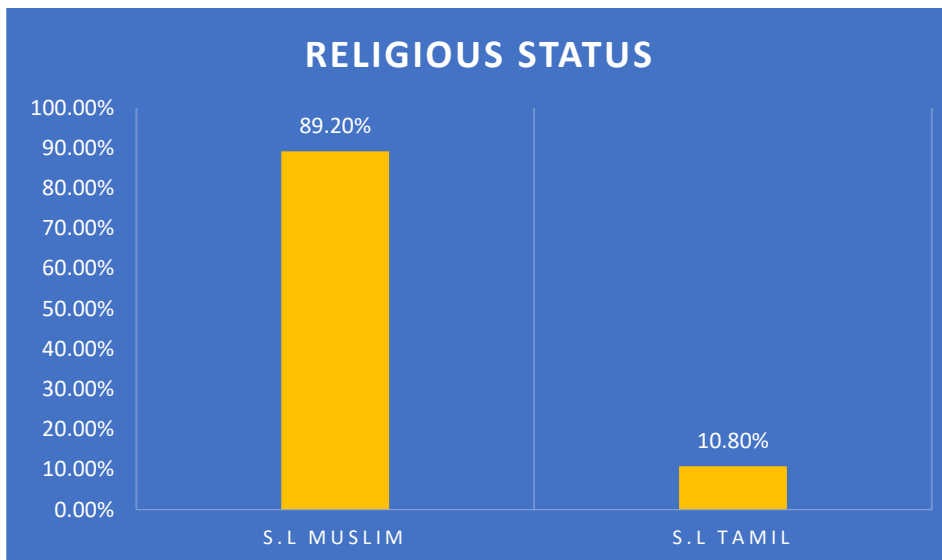


Fig. 3. The religious status of fishing boat owners in Batticaloa, Sri Lanka

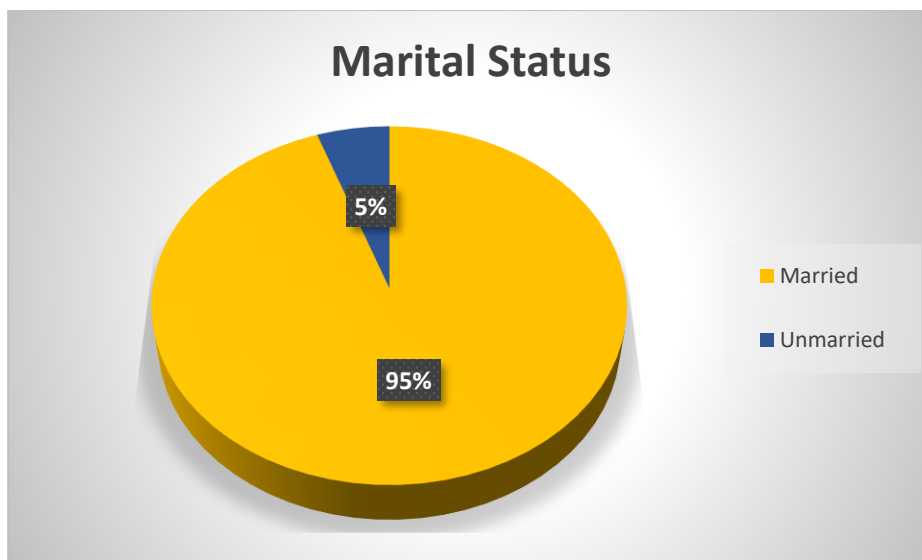


Fig. 4. Marital status of fishing boat owners in Batticaloa, Sri Lanka

### 3.5 Children's Participation in Business, Education, and Other Economic Activities

In the fishing boat owner's family, different numbers of people perform various activities the distribution of children in business management follows as - 1 child in the family (74.3%), 2 children in the family (23%), and 3 children in the family (2.7%). After that, in schooling-1 child in the family (55.4%), 2 children in the family (35.1%), and 3 children in the family (9.5%), the distribution of children performing other economic activities - 1 child in the family (74.3%)

and 2 children in the family (25.7%) they are performing other economics activities like shopkeeping and domestic business was graphically shown in Fig. 6.

### 3.6 Housing Conditions and Facilities

Socioeconomic status is calculated by the conditions and facilities of the respondent's house. The house will indicate the livelihood standard. The walls of fishing boat owners found that 60% had cement walls, 37.33% had a brick wall and 2.67% had hollow block walls. The roofing of 73.33% had tile roofs, 10.67% had an asbestos roof, 5.33% had tin roofs, 2.67% had

thatched roofs, and 2.67% had tin and tile combined roofs. The floor was made of cement in 62.67% of houses and floor tiles in 37.33% of houses. In the houses of fishing boat owners water sources and latrine facilities are available 100% are shown in Table 1.

### 3.7 Basic Utilities/Appliances

A (Yes or No) question is used to gather basic utilities/appliance availability. 100% of the fishing

boat owner's houses have been found with electricity. LP gas is available in only 24.32% of houses, while firewood is used in the rest of 75.68% of houses to prepare food, refrigerators have been found in 100% of dwellings, TV is found in 97.30% of houses, telephone (landline or mobile) available in 97% of houses and motorized transports are also used by 97% of houses are shown in Table 2.

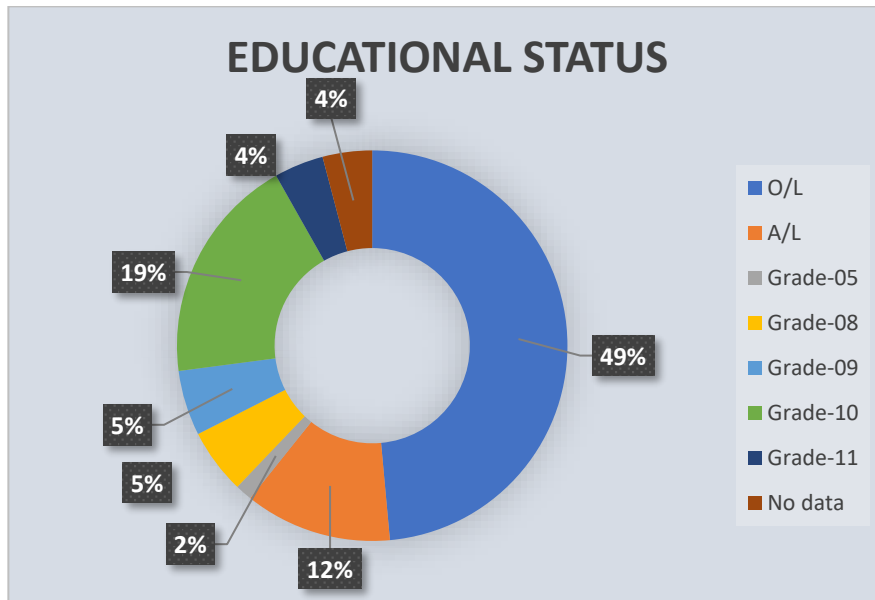


Fig. 5a. Educational Status of Fishing Boat Owners in Batticaloa, Sri Lanka

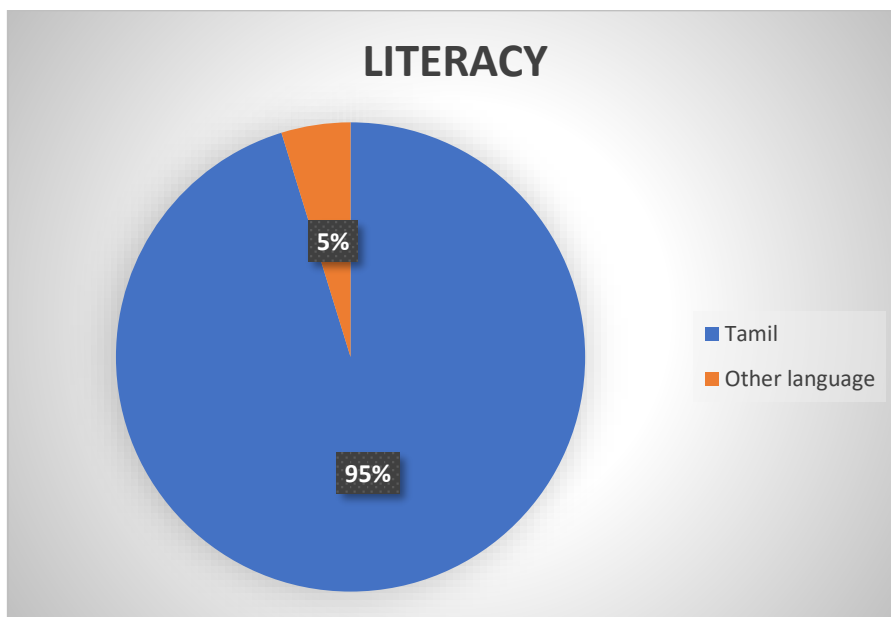


Fig. 5b. Literacy in the Language of fishing boat owners in Batticaloa, Sri Lanka

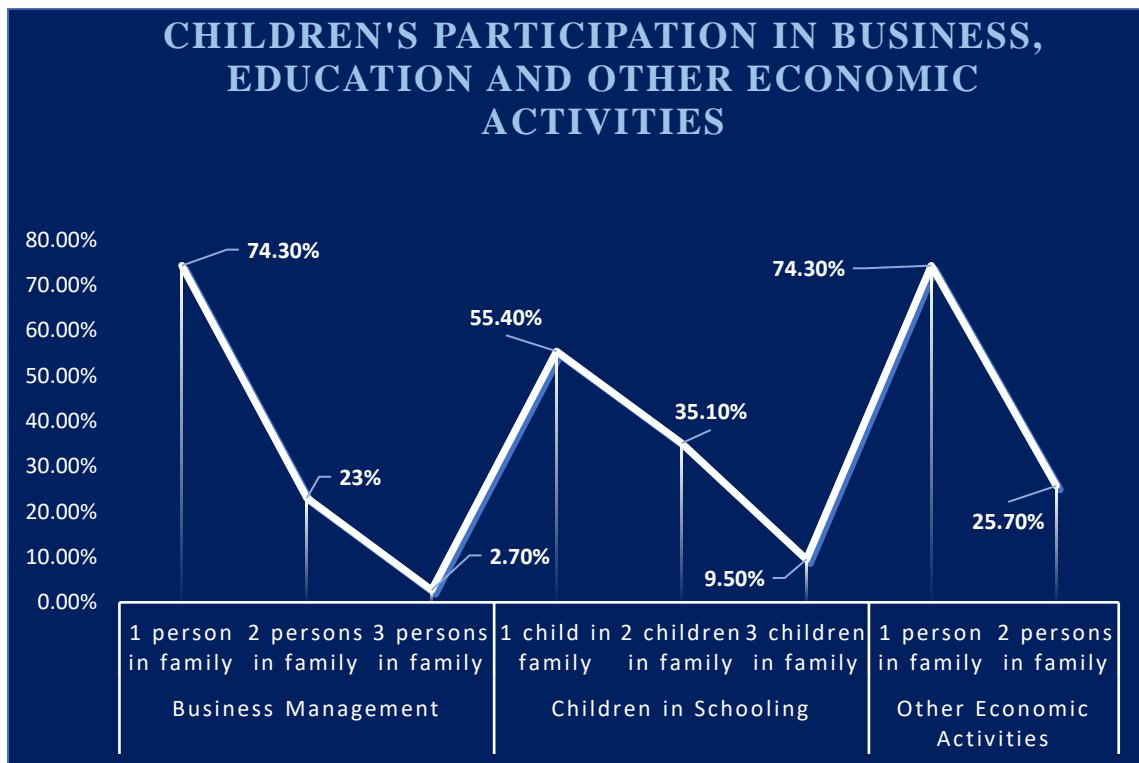


Fig. 6. Children's participation in business, education, and other economic activities of fishing boat owners in Batticaloa, Sri Lanka

Table 1. Housing conditions and facilities of the fishing boat owners

S no:	Category	Material	Percentage (%)
1.	Roofing	Tiles	73.33%
2.		Asbestos	10.67%
3.		Tin	5.33%
4.		Thatched	2.67%
5.		Tin, Tiles	2.67%
6.	Walls	Cement	60.00%
7.		Bricks	37.33%
8.		Blocks	2.67%
9.	Floor	Cement	62.67%
10.		Floor Tiles	37.33%
11.	Water Source	Available	100.00%
12.	Latrine	Available	100.00%

Table 2. Basic utilities/appliances of the fishing boat owners

S no:	Facility	Availability	Percentage
13.	Electricity	Yes	100%
14.	Food preparation Method	LP Gas	24.32%
		Firewood	75.68%
15.	Refrigerators	Yes	100%
16.	Television	Yes	97.30%
17.	Telephone (Landline or Mobile)	Yes	97%
18.	Motorized Transport	Yes	97%

**Table 3. The investments in crafts and gears**

S.no	Gears and Craft	Amount (LKR-Sri Lankan Rupee)
19.	Craft price range	60,00,000 to 2,70,00,000 LKR
20.	Insurance for Crafts	17,000 to 2,20,000 LKR
21.	Gears price range (Nets)	15,000,000 to 25,000,000 LKR
22.	VMS (Vessel Monitoring System)	36,000 to 76,000 LKR
23.	Gear (Long Line)	100,000 to 200,000 LKR

**Table 4. The revenue sharing among the Owner, Skipper, and Crew members**

S.no	Stakeholders	Revenue in LKR-Sri Lankan Rupee
24.	Owners	7,000 to 20,00,000 LKR
25.	Skipper	1,800 to 10,00,000 LKR
26.	Crew members	1,800 to 10,00,000 LKR

**Table 5. The operational expenditure of crafts**

S.no	Provisions for Crafts	Expenditure in LKR-Sri Lankan Rupee
27.	Food & Beverages	15,000 to 1,50,000 LKR
28.	Fuel & Oil	60,000 to 1,75,000 LKR
29.	Ice	18,000 to 1,00,000 LKR
30.	Bait	5,000 to 50,000 LKR
31.	Other provisions	5,000 to 1,00,000 LKR
32.	Repair & Maintenance	2,00,000 to 10,000,000 LKR

**Table 6. FAO policies and programs**

S.no	Policies and Programs	Scope
1.	FAO National Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported, and Unregulated (IUU) Fishing (FAO., 2008).	To prevent, deter, and eliminate IUU fishing, ensuring sustainable fisheries in Sri Lanka.
2.	Fisheries and Aquatic Resources Act, No. 2 of 1996 (FAO., 1996).	To manage, regulate, conserve, and develop fisheries and aquatic resources in Sri Lanka.
3.	FAO Regional Workshop on IUU Fishing (FAO., 2006).	To assist countries in developing national plans of action to combat IUU fishing.
4.	FAO Fisheries and Aquaculture Projects (FAO., 2021).	To enhance fisheries management and promote sustainable fishing practices.
5.	IFAD Project on Post-Tsunami Rehabilitation I (FAD., 2010).	To rehabilitate and develop the fishing industry in Sri Lanka post-2004 tsunami.
6.	FAO Microfinance in Fisheries (FAO., 2015).	To provide access to credit for small-scale fishers and boat owners for purchasing necessary equipment.
7.	FAO Community-Based Fisheries Management (FAO., 2020).	To empower fishing communities in decision-making processes for sustainable fisheries management.
8.	FAO Climate Change Adaptation in Fisheries (FAO., 2018).	To build the resilience of fishing communities to climate change impacts and promote sustainable practices.

### 3.8 Fishing Period

Fishing happens throughout the year in Batticaloa, Sri Lanka. They operate IMUL

(Inboard Multi-day Use Long liner) boats up to 7 to 24 days/month in a year and EEZ (Exclusive Economic Zone) & Deepsea vessels are operated up to 14 to 20 days/month in a year.



The fishing ban period in Batticaloa, Sri Lanka typically occurs in the monsoon season to protect fish populations and ensure sustainable fishing practices.

### **3.9 Investments in Gears and Craft, Revenue Sharing, and Operational Expenditure of Crafts (Tables 3, 4, and 5.)**

FAO policies and programs that practices in Batticaloa district, Sri Lanka are shown in Table 6.

The Socioeconomic study helps to understand the living conditions, economic status, the challenges and opportunities that are faced by the specific community or people and provides the basic pieces of information about their living style. In the study area of the Batticaloa district the following data are collected that are Age Group, Religious Status, Marital Status, Educational Status and Literacy in the Language, Children's participation in business, education and other economic activities, Housing Conditions and Facilities, Basic Utilities/Appliances, Fishing Period, and Investments in Gears and Craft, Revenue Sharing and Operational Expenditure. It helps to analyze the socioeconomic profile and fishing operation of the fishing boat owners in the study area. This study indicates that aged persons are highly involved in fishing-related business. Only a few of the next-generation children participate in their business. Most of the fishing boat owners in this study are married.

The boat owners had literacy in the Tamil language. They didn't have higher education, most of them studied up to 11<sup>th</sup> grade only. Most of the fishing boat owner's children are going to school, and some of the grown children are participating in the fishing business. Also, they are participating in other economic activities like shopkeeping and small-scale businesses. They are living in normal houses with basic utilities and appliances. Most of them have motorized transport and mobile or landlines in their houses. They are doing the fishing throughout the year. There is also the fishing ban period for specific species are followed to help fish for their reproduction and growth. The fishing boat owners are investing a large amount of money in crafts & gears, gadgets like sonar, and VMS (Vessel Monitoring System). Also, they have to invest money for the basic needs of the fishing

operation like fuel, food & beverages, ice, oil, bait, and other provisions.

This study detailly denotes the socioeconomic status of the fishing boat owners fluctuating around the poverty line because of the unstable income and high capital investment. Also, it affects the secondary and low-level workers. They are suffering below the poverty line and they are forced to search the other works and businesses for their livelihood. This unstable income and high capital investment are happening due to the economic crisis and instability that happened in Sri Lanka. It increases the fuel, basic goods, and food prices. It affects all industries and sectors including fishing. So, the fisherman communities suffer from these problems.

## **4. CONCLUSION**

Fishing is one of the most significant sources of income for the residents around the Coastal region of the Batticaloa District, Sri Lanka. They mainly depend on the marine capture fisheries to maintain the life of the fishing boat owners and secondary-level workers in the fishing community. This study reveals that the socioeconomic profile of the fishing boat owners in the study area, reveals a fragile state, fluctuating around the poverty line. Despite marine fishing being the primary source for fishing boat owners, they suffer from various types of challenges including high operational costs and capital investment, fluctuating and low revenue, and limited income diversification, contributing to their precarious financial situation. This all happens because of the economic crisis in Sri Lanka due to the COVID-19 pandemic, wars in other nations indirectly, corruption, political instability, excessive borrowing, and economic mismanagement. This study suggests that establishing a stable and efficient government is paramount for fostering national stability and economic growth. Additionally, developing & supporting programs should be conducted in the coastal region to support the fishing communities who are fishing boat owners and secondary & low-level workers in fishing.

## **DISCLAIMER (ARTIFICIAL INTELLIGENCE)**

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generative AI technology and as well as all input prompts provided to the generative AI technology.

Details of the AI usage are given below:

1. Grammarly 2024
2. Microsoft Copilot-2024

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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