



## Assessment Of Socioeconomic Status And Livelihood Index Among Small-Scale Fishermen Along The Kakinada Coast, Andhra Pradesh, India.

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Article History	Abstract
Received: Revised: Accepted:	This present study provides an overview of the socio-economic characteristics and livelihood capitals of small-scale fishermen (SSF) in Kakinada Coast, Andhra Pradesh, India. It highlights key parameters such as age, sex, household structure, occupational status, income, and expenditure. The study also examines the five central capitals that influence the livelihoods of SSF: human, natural, financial, physical, and social capital. The majority of SSF in Kakinada Coast are in the prime working age group (25-54), with fishing being their primary occupation. The average household size is 4.81, with an average of 2.51 male members and 2.30 female members. Male SSF dominate the community, accounting for 96% of respondents, while females make up only 4%. The physical assets of SSF include large and small boats, fishing gears, drying racks, spades, radios, cooking pots, and jars. Access to natural capital, such as land, open water, usable forest, and aquatic resources, is limited for floating fishers. SSF have a limited level of human capital, including knowledge, skills, education, mental health, disease frequency, and access to training. The livelihood assessment index indicates that SSF possess a moderate level of human, financial, physical, natural, and social capital.
CC License CC-BY-NC-SA 4.0	<b>Keywords:</b> Socio-economic status, livelihood index, small scale fishermen, Kakinada coast

### 1. INTRODUCTION:

The importance of small-scale fisheries (SSF) in promoting human development has garnered heightened recognition, particularly with the adoption of sustainable development goals. Globally, small-scale fisheries play a pivotal role in ensuring food and nutrition security, as well as sustaining the livelihoods of coastal communities. Their contributions extend beyond mere economic aspects, encompassing vital support for the well-being of these communities worldwide. In essence, small-scale fisheries are integral to the fabric of

human development, addressing critical issues such as livelihoods, food security, and the overall welfare of coastal populations [1]

Small-scale fisheries (SSF) based livelihoods face a myriad of challenges that jeopardize their sustainability. Overfishing and destructive fishing practices, coupled with inappropriate coastal development and land-based pollution, pose significant threats to the productivity of the resource base. Inefficient fish handling and post-harvest practices, along with inadequate infrastructure, contribute to high discards and post-harvest losses. Moreover, the cumulative impacts of a changing climate, such as shifts in species abundance and range, increasing ocean acidity, deoxygenation, and unpredictable weather patterns, further undermine the certainty and increase risks associated with fishing activities [2,3].

The situation is exacerbated by the fact that highly productive SSF often coincide with globally valuable ecosystems in the equatorial tropics, leading to a tension between growth-oriented domestic fisheries policies and the international conservation movement. Despite these challenges, key concepts like sustainable livelihood and the emerging idea of "livelihood resilience" offer valuable perspectives for navigating the complexities of SSF-based livelihoods [4]. Notably, the concept of livelihood resilience acts as a bridge between resilience and the livelihood approach, representing the capacity of livelihoods to maintain or enhance their functions in the face of shocks. This involves strategic adaptations that promote sustainability and stability amidst ongoing changes. However, it is crucial to note that these concepts have yet to be empirically investigated, despite existing conceptualizations [5].

The Kakinada coast of Andhra Pradesh, a part of Bay of Bengal coastal line and the topography extends up to mangrove ecosystem and estuary. This coastal study is one of the livelihood opportunities to many fisherman communities which includes small scale coastal fishermen, Deep-sea fishermen, commercial fishermen, Artisanal fishermen and recreational fishermen communities [6,7].

The present study focuses on evaluation of socio-economic status of small-scale fishermen (SSF) community belongs to the Kakinada coastal region of Andhra Pradesh. The exploration of livelihood resilience in fisheries not only plays a crucial role in advancing conceptual frameworks but also contributes to the development of methodologies for studying intricate social challenges within ocean coastal environments. The knowledge derived from employing inclusive, people-centric concepts and employing rigorous research approaches contributes to the generation of high-quality scientific insights. These insights, in turn, provide valuable input for informing ocean policies and shaping management interventions designed to address evolving challenges in ocean and coastal areas.

## 2. Materials and Methods:

### 2.1. Study Area and Sampling Procedure:

Kakinada, a port city and major growth centre on the east coast of India. The Kakinada coastal line provides livelihood opportunities to the fishermen communities. In the present study. A total of 102, SSF house hold heads were interviewed to evaluate their socio-economic status during September 2022. The questionnaire was developed with slight modification with reference to the... which involved livelihood capitals such as human, natural, financial, physical and social capitals represented in table 1. All the monetary values are represented as US \$, Where 1 US \$ = Approximately 79 INR during the study period.

**Table 1: Variables of the livelihood capitals assessment of SSF community of Kakinada Coast.**

Name of the Capital	Indicators/Components	Description
Human Capital	Education levels	Illiterate to schooling
	Skill	Amount of fish catch/day
	Knowledge	% of fishermen with good ground fishing knowledge
	Mental health	Access to various recreational activities
	Disease frequency	Times/household/Month
Financial Capital	Access to training	Trained by Govt Organizations/NGOs
	Income	Amount of Income/Month/Household
	Savings	Amount of Savings/

	Loan from NGOs/Dadonder/Informal Institution's	Month/Household Amount of loan/year/household
Physical Capital	Large boat/small boat/fishing nets/gears	Number of physical capitals and value
	Other accessories	Value
Natural Capital	Land	Decimals
	Access to open water/useable forest/Aquatic resources	% of respondents
Social Capital	Mutual trust and reliability	
	Sharing socially held knowledge	
	Relationship with neighbours	% of respondents
	Participation of women in decision making	
	Associations	% of respondent's members of NGOs, Union council, Local institutions

**2.2. Livelihoods framework of small-scale fishermen:** Livelihood refers to the means of living, involving capabilities, assets, and activities. The sustainable livelihood approach, pioneered by the UK's Department for International Development, is widely applied in diverse fields like poverty alleviation and environmental management. Household livelihoods depend on access to various assets: human, natural, financial, physical, and social capital. Substitutability among these assets determines livelihood flexibility. For Small scale fishermen community five capitals are central. The framework guides studies on poverty, resource management, and tourism. Household food poverty is assessed through calorie intake, primarily influenced by their catch.

**2.3. Empirical analysis:** Various statistical measures, including averages, percentages, and ratios, were computed and displayed in both tabular and graphical formats to assess socioeconomic characteristics and livelihood capitals. Additionally, the Livelihood Assessment Index (LAI) was calculated, and the Foster-Greer-Thorbecke (FGT) index was utilized to gauge the food poverty of small-scale fishermen (SSF).  
Livelihood of small-scale fishermen =  $f$  (human, financial, physical, natural, and social capital).

### 3. Results and Discussion:

**3.1. Socio-economic characteristics SSF:** The present study evaluated the socio-economic status of small-scale fishermen community belongs to Kakinada Coast, Andhra Pradesh, India. Age, sex, household structure, occupational status, Income and expenditure are key parameters evaluated in this study and the results are represented in table 2. Majority (97.74%) of the SSF were found in prime working age group (25-54) which may be due to their enhanced physical strength. The average size of the HH was 4.81 and average member of male and female in the family was 2.51 and 2.30 respectively. Out of 102 respondents, male SSF are dominated (96%) whereas only 4% of SSF are females. In this study, the fishing was considered as primary occupation (92.7%) while few of are also involved in ferrying and fish business as secondary occupation (7.3%) and the most of the fishermen gained knowledge about fishing from their predecessors. The majority of respondents income and expenditure lies between 150-200 \$ (53.92% and 58.82% respectively).

**3.2. Livelihood status of SSF:** Human, physical, natural, social and financial capitals were evaluated to assess the livelihood status of SSF.

Human capital includes the education, skill, knowledge, attitude, training, ability, physical and mental health together these enable to pursue SSF livelihood strategies and measured using the descriptive techniques [8,9]. Out of the all respondents only 6.86% fishermen are educated in the present study table 3. In most cases, the women in SSF households participate actively in fishing along with the household works. Many of the respondents are well known about the Kakinada Bay environment. Since many of them required training to develop the skills in fishing practice and only 7% respondents accessing training from NGOs and Government Organizations. The unhygienic life style, lack of sanitation, pure drinking water and proper

treatment, disease frequency is high among SSF (4.6 times/household/month). The fishing skill of SSF vary from individual to individual and maximum skill of SSF was found 2.01-4kg/day in the present study.

The various financial assets individuals possess, including income, savings, credits, and remittances, constitute financial capital, offering diverse opportunities for their livelihoods. This valuable resource can be utilized to acquire different forms of capital, such as natural capital (e.g., land), physical capital (e.g., fishing equipment), and human capital (e.g., education or training). Furthermore, an individual's financial capital can enhance their social capital, as a favourable socio-economic status often aligns with a strong financial position [10,11]. Table 2 showing the financial capital (income and expenditure of SSF).

Physical capital refers to the essential infrastructure that facilitates individuals in pursuing their livelihoods, including aspects like transportation, housing, water, energy, communications, and production equipment. Table 4 outlines the physical assets accessible to floating fishers. Among these, the most substantial contribution to their physical capital comes from the boats, with large and small boats constituting approximately 23.52% and 2.9% of the total physical assets, respectively. The large boats, which lack mechanization, serve as both living quarters and storage for fishing gear. On the other hand, the smaller boats, equipped with low-horsepower engines, are employed for semi-mechanized fishing activities. Additionally, the fishing net stands out as a crucial physical asset for floating fishers, being the primary tool for catching fish [12,13].

Natural capital refers to the availability, quality, and quantity of natural resources, with a crucial emphasis on people's access to and control over these resources. To assess natural capital, participants were queried about their access to land, usable forest and timber, aquatic resources, and freshwater, with calculations performed using descriptive techniques. The floating fishers lacked land for constructing homes or engaging in cultivation, having been landless for generations and residing in large boats. Access to drinking water was limited for most floating fishers, as they lacked nearby tube wells or alternative water sources [4,5].

**Table 2: Socio-economic characteristics of the sampled small-scale fishermen**

<b>Characteristics</b>	<b>Percentage (%) of respondents</b>
<b>Age of household heads (years)</b>	
0-14 (Children)	0
15-24 (Early working age)	0
25-54 (Prime working age)	97.74
55-64 (Mature working age)	2.3
65 > (Elder)	0
<b>House hold structure</b>	
Average household size	4.81
Average male member	2.51
Average female member	2.30
<b>Sex of respondents</b>	
Male	96
Female	4
<b>Occupational status of HH head</b>	
Fishing	92.74
Fish Business	6.274
Ferrying	0.98
<b>Monthly income per household (\$)</b>	
Below \$100	0
100-150	28.43
150-200	53.92
200 >	17.64
<b>Monthly expenditure per household (\$)</b>	
Below \$100	27.45
100-150	58.82
150-200	9.80
200 >	2.94

**Table 3: Status of human capitals of selected respondents**

Indicators	Value
<b>Education (% respondents)</b>	
Illiterate	59.80
Capable of sign	10.78
Primary	22.54
Secondary	6.86
<b>Skill (amount of catch in kg/day)</b>	
Less than 2kg/day (%)	11.76
2.01-4 kg/day (%)	43.13
4.01-6 kg/day (%)	5.88
Above 6 kg/day (%)	39.21
Knowledge about well-known fishing ground (%)	58.82
Access to training (%)	7.84
Disease frequency (times/household/month) (%)	4.6

**Table 4: Physical assets, Associations, Natural capital and training capitals**

Component	% of respondents
<b>Physical assets</b>	
Large boat	23.52
Small boat	2.9
No own boat	16.66
Fishing gears	45.09
Drying racks	1.96
Spade	2.9
Radio	1.96
Cooking pots	2.9
Jars	1.96
<b>Associations</b>	
NGOs	5.8
Member of fish cooperative societies	4.9
Member of Union council	5.8
Involvement with local institution	4.9
None of the above	78.43
<b>Natural Capital</b>	
Own land	14.70
Access to open water	80.39
Access to useable forest	2.94
Access to aquatic resources	0.98
<b>Training</b>	
Government Organizations	6.86
NGOs	0.98
No Training	92.15

The study employed the Livelihood Assessment Index (LAI) to analyze the livelihood status of floating fishermen. The comprehensive index value indicated that they possessed a limited level of human capital, encompassing aspects such as knowledge, skills, education, mental health, frequency of diseases, and access to training (Table 5).

**Table 5: Livelihood capitals & Livelihood assessment index.**

Livelihood Capitals	Values of capitals
Human	0.411
Financial	0.027
Physical	0.271
Natural	0.301
Social	0.618

**Conclusion:**

The study focused on evaluating the socio-economic status and livelihood index of small-scale fishermen along the Kakinada Coast in Andhra Pradesh, India. The findings revealed that the fishermen possessed a limited level of human capital, including knowledge, skills, education, mental health, and access to training. The majority of the respondents had a monthly income between \$150-200, and their expenditure also fell within the same range. The study highlighted the challenges faced by small-scale fisheries, such as overfishing, destructive practices, and the impact of climate change. The concept of livelihood resilience was introduced as a means to navigate these challenges and promote sustainability and stability in the face of ongoing changes. However, further empirical investigations are needed to explore these concepts in depth. Overall, the study provided valuable insights into the socio-economic status and livelihoods of small-scale fishermen in the Kakinada Coast region.

**Author Contribution:**

**TVR:** Methodology, Investigation, Writing the original manuscript

**AM:** Data curation, validation

**PVN:** Editing, Reviewing the manuscript

**NS:** Conceptualization, Methodology, Reviewing the manuscript

**References:**

1. Islam M M, Sallu S, Hubacek K and Paavola J 2014 Vulnerability of fishery-based livelihoods to the impacts of climate variability and change: Insights from coastal Bangladesh *Reg. Environ. Chang.* **14** 281–94
2. Makwinja R, Kaunda E, Mengistou S, Alemiew T, Njaya F, Kosamu I B M and Kaonga C C 2021 Lake Malombe fishing communities' livelihood, vulnerability, and adaptation strategies *Curr. Res. Environ. Sustain.* **3** 100055
3. Tikadar K K, Islam M J, Saha S M, Alam M M, Barman S K and Rahman M A 2022 Livelihood status of small-scale fishermen and determinants of their income: Insights from north-eastern floodplains of Bangladesh *Geogr. Sustain.* **3** 204–13
4. Purcell S W, Crona B I, Lalavanua W and Eriksson H 2017 Distribution of economic returns in small-scale fisheries for international markets: A value-chain analysis *Mar. Policy* **86** 9–16
5. Mangubhai S and Lawless S 2021 Exploring gender inclusion in small-scale fisheries management and development in Melanesia *Mar. Policy* **123** 104287
6. Richmond L and Casali L 2022 The role of social capital in fishing community sustainability: Spiraling down and up in a rural California port *Mar. Policy* **137** 104934
7. Amadu I, Armah F A, Aheto D W and Adongo C A 2021 A study on livelihood resilience in the small-scale fisheries of Ghana using a structural equation modelling approach *Ocean Coast. Manag.* **215** 105952
8. Stacey N, Gibson E, Loneragan N R, Warren C, Wiryawan B, Adhuri D S, Steenbergen D J and Fitriana R 2021 Developing sustainable small-scale fisheries livelihoods in Indonesia: Trends, enabling and constraining factors, and future opportunities *Mar. Policy* **132** 104654
9. Garcia Lozano A J, Decker Sparks J L, Durgana D P, Farthing C M, Fitzpatrick J, Krough-Poulsen B, McDonald G, McDonald S, Ota Y, Sarto N, Cisneros-Montemayor A M, Lout G, Finkbeiner E and Kittinger J N 2022 Decent work in fisheries: Current trends and key considerations for future research and policy *Mar. Policy* **136**
10. Onyango H O, Ochiewo J, Aura C M, Kayanda R, Sunil S S, Otuo P W, Obuya J A and Njiru J M 2021 The Lost Coin: Redefining the economic and financial value of small-scale fisheries, the case of Lake Victoria, Kenya *Soc. Sci. Humanit. Open* **4** 100221
11. Selvaraj J J, Guerrero D, Cifuentes-Ossa M A and Guzmán Alvis Á I 2022 The economic vulnerability of fishing households to climate change in the south Pacific region of Colombia *Heliyon* **8**
12. Ahmed M, Saha S M, Hossain M E, Khan M A and Prodhan M M H 2021 Assessment of livelihood and food poverty status of the floating fishermen in riverine system of Bangladesh *Soc. Sci. Humanit. Open* **4** 100219
13. Runde A, Hallwass G and Silvano R A M 2020 Fishers' Knowledge Indicates Extensive Socioecological Impacts Downstream of Proposed Dams in a Tropical River *One Earth* **2** 255–68