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Gaining mastery in the male bastion of marine fishing: A spotlight on a seagoing fisherwoman from West Bengal

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Short communication

Abstract

The case study of Smt. Minakshi Manna, a seagoing fisherwoman from Dakshin Purusottampur in the East Midnapur district of West Bengal, illuminates the remarkable journey of a woman who defied traditional gender norms to excel in the male-dominated marine fishing sector. Over 35 years, she has mastered the field of marine fishing, transitioning from estuarine bag net fishing to operating motorized gillnetters in the sea. Against this background, it was decided to conduct a technoeconomic evaluation of the fishing method employed by her to assess the economic efficiency. The study revealed that the average operating cost per trip amounted to Rs. 15,245/-, while the gross revenue generated was Rs.25,385/-, resulting in a net operating income of Rs. 10,140/-. The majority of the operating costs (more than 86%) were attributed to crew wages and diesel expenses. The analysis also assessed the Capital Productivity at 0.60 and the Gross Value Added as a percentage of Gross Revenue at 80.68. The labour productivity was calculated at 46.67 kg/crew/trip whereas the input-output ratio stood at 0.19. These findings provide valuable insights into the economic performance and sustainability of Smt Minakshi Manna's fishing operations. Society's perception of women in marine fishing is evolving, with Minakshi being recognized for her skills, resilience, and contributions to the fishing industry. Challenges persist, including limited access to subsidies, and institutional finance. However, Minakshi remains content with her occupation, finding satisfaction in her work despite the constraints. Minakshi's success story highlights the potential for women's empowerment in the fisheries sector and calls for increased visibility and acknowledgement of their contributions.

Keywords: Fisherwoman, seagoing, economic analysis, motorised craft

Introduction

Gender researches reveal that despite the important role women play in agricultural production, they remain disadvantaged in numerous respects. Furthermore, many non-tangible assets, such as social capital, human capital, rights and decision-making power, are more difficult for women to access. According to an FAO study (FAO, 2011), had they enjoyed the same access to productive resources as men, women could boost yield by 20-30%, raising the overall agricultural output in developing countries by 2.5-4%. This gain in production could lessen the number of hungry people in the world by 12-17%, besides increasing women's income. The economic development of women and men depends on the availability of income-generating activities, their formation as groups, rewarding of their efforts and skills and their ability to participate equally (Kumar *et al.*, 2019).

Coastal areas have their distinct ecology which determines the livelihood strategies of the people. Women play an important role in fishing communities all over the world. This role encompasses social and economic responsibilities and duties, both within and outside the family, including marketing, processing and also harvesting of aquatic products. Developmental efforts over the last few decades have made it clear that sustained improvements in the productivity and the lives of fisherfolk depend on the recognition of this crucial role of women, in supplementing family income and maintaining the social and cultural foundations of the fishing communities. In this context, this study documents the success story of a seagoing fisherwoman from West Bengal, Smt. Minakshi Manna is the only seagoing fisherwoman from Dakshin Purusottampur of East Midnapur district in West Bengal who made her identity in the male bastion of the marine fishing sector.

Material and methods

The study was conducted during the year 2023-24 at Dakshin Purusottampur of East Midnapur district in West Bengal (Fig. 1). The socio-personal profile was documented by extracting data through the interview method using a semi-structured questionnaire. The information on investment, operational expenses and returns of the motorised boat-gill net blend were gathered. Information on the amount and estimation of various species caught by the unit; labour share costs and wages including food, stores and other provisions; fuel (energy) expenses; expenses on craft and gear repair and maintenance and other operational costs; expenses of different inputs; auction charges, and taxes; capital costs involving investment of fishing craft and gears; information on boat and nets and personnel details were gathered using a pre-tested schedule.

Primary information was gathered for the investigation. The investigation of the monetary exhibition of fishing technique was evaluated by working out the working expense per trip, gross income and net income per trip. The capital and labour profitability were worked out utilizing working proportion and catch per trip (Sathiadhas, 1989). By and large, working proportion, net income, capital profitability, labour efficiency (kg/person/trip), input-output proportions, Gross Value Added and Gross Value Added as a percentage of Gross Revenue were worked out as the pointers of financial proficiency as done in other marine fishing studies (Narayanakumar *et al.*, 2009; Raju *et al.*, 2022a, 2022b; Roul *et al.*, 2023).

Cost-return proportions were utilized to quantify the overall input and output efficiency in terms of value. Working cost proportion relates variable expenses to gross revenue. The



Fig. 1. Map showing the study area

income or the gross revenue of a unit is the whole of total worth by multiplying the amounts of various species/groups with their respective prices.

Input-Output Ratio = Input expenses/Total Revenue.......(1) Operating Ratio = Operating expenses/Total Revenue.......(2)

The essential information was gathered on working expenses per trip, which incorporated the expenses of fuel, labour compensation, food costs, sell-off charges, fix and upkeep and other everyday costs for completing the fishing tasks. The operating expense per trip was in this manner determined as follows;

Operating Cost/trip = (Fuel + labour charges + food costs + selloff charges + fix and upkeep charges + Other expenses)(3)

The gross income per trip was determined from the species composition of catch and value per species. The gross income per trip was assessed as follows;

11	
GR per trip = $\Sigma q_i p_i$	(4)

i=1

Where,

qi is the amount of catch in kg of the ith assortment pi is the value per kg of fish of the ith assortment

Labour efficiency = Catch (kg) / Number of Crew.....(5) Net Cash Flow (NCF) = Gross Revenue – Operational Costs (6)

The net cash flow is regarded as an award for entrepreneurship.

Gross Value Added (GVA) = Net Cash Flow + Labour costs..... (7)

The gross worth added shows the arrival of the fishing vessel tasks to the economy and is useful for making future fisheries sector investment and expenditure decisions.

GVA to revenue = GVA / Gross revenue from landings...... (8)

The GVA to revenue figure is expressed as a percentage and provides for the portion of income that adds to the economy through the creation factors (Carvalho *et al.*, 2020).

Results and discussion

Smt. Minakshi Manna from Dakshin Purusottampur in East Midnapur district of West Bengal is 58 years old with no formal education, who is married and belongs to a joint family of 14 members (Fig. 2A). The joint family consists of four adult male members, five adult female members and five children. The family owns a thatched house. Her sole occupation is marine fishing, with 35 years of experience in sea-going. On an average, she is engaged for 240 days in fishing and its marketing.

Her major source of information related to fisheries was television, friends and relatives, and neighbours. The formal sources were the Department of Fisheries and private input dealers. She also had a good linkage with the Digha Regional Station of ICAR-CMFRI, through regular participation in stakeholder meetings and workshops. Her social participation behaviour was explicit from her membership in the Soula Fisherman & Fish Trader Association. Gender discrimination in family decision-making was not observed, as the major investment decision-making pattern was with the involvement of both men and women in the family.

From the analysis of her daily routine, it could be observed that on an average she was spending about 16 hours per day in fishing and disposing of the catches. Access to institutional finance was nil, and the major sources of finance for the business were private money lenders. Smt. Minakshi Manna's livelihood solely depended on a motorised craft (Fig. 2B), mostly operating gillnets (Fig. 2C) and occasionally hooks and lines, and performing single-day (10 hours) fishing operations. The craft is 11.3 metres OAL with an engine power of 22 H.P. The diesel requirement was 30 litres per trip. The crew size was 6 (Table 1), and the average catch per trip was 280 kg.

The major species landed in gillnets were *Tenualosa ilisha*, Anodontostoma chacunda, Coilia dussumeiri, C. ramacarati, Setipinna spp., Thryssa spp., Harpadon nehereus, Trichiurus lepturus, Lepturacanthus Savala, Scoliodon laticaudus,



Fig. 2. A) Smt Minakshi Manna, a seagoing fisherwoman from Dakshin Purusottampur, West Bengal; B) Motorised fishing craft; C) Gillnet operated from motorised fishing craft; D) Transportation of catch to auction centre

Plicofollis dussumieri, P. tenuispinis, Osteogeneiosus militaris, Chrysochir aureus, Pterotolithus maculatus, Otolithoides pama, Panna heterolepis, Pennahia ovata, Otolithes ruber, Johninus spp., Polynemus paradiseus, Portunus sanguinolantus, P. pelagicus and Penaeus spp. Similarly, the major species that landed in hook and line were sharks, large-sized rays, groupers, needlefishes, eel, cobia, queen fishes, seer fishes, catfishes, large-sized polynemids and large-sized croakers. The different channels the landings go through from the landing centre were the wholesale and retail markets of Balisahi, Ramnagar, Contai, Darua, Pichabani, Mandaramani, Sapua (Fig. 2D).

The economic analysis of motorised craft with gill net of Smt Minakshi Manna showed that the average operating cost per trip was Rs. 15,245/- with a gross revenue of Rs.25,385/-. Thus, earning a net operating income of Rs.10,140/-. Fifty per cent of gross revenue was paid as crew share after deducting input costs from the gross revenue. Wages for crew and expenses on diesel accounted for more than 86% of the total operating cost. It was observed that Capital Productivity was 0.60. The Gross Value Added as a percentage of Gross Revenue was 80.68. The labour productivity was worked out to be 46.67 kg/crew/trip and the input-output ratio was 0.19 (Table 2).

Smt Minakshi Manna's decision to venture into sea-going fishing was influenced several factors. Being born into a poor family, she even couldn't get a minimum education, forced to support her parents in agricultural activities for her family's subsistence during childhood. At an early age, she was married to a poor fisherman who was fishing with bottom set bag nets (locally known as *Behundi jal*) in the estuarine area and mouth of the river Soula as the only source of income, with lack of access to agricultural lands for cultivation. Due to the financial crunch in hiring crew for the onboard activities, Smt Minakshi decided to join hands with her husband in the fishing activities. With the increasing financial needs brought about by her growing family, they shifted from bag net fishing to gillnet fishing (inboard motorised gillnetter) for venturing into the sea.

Table 1. Technical	profile of fishing	equipment	and fishing p	oattern of	Smt. Minaksh	i Manna

No.	Particulars	Gillnetter	
1	Overall Length (OAL) (feet)	39.37	
2	Engine (H.P)	22	
3	Number of Crew	6	
4	Depth of Fishing (metres)	80	
5	Distance to the fishing ground (km)	30	
6	Number of hauls/trip	1	
7	Duration of haul (hours)	3-4	

Table 2. Average operating	cost and returns	per trip (SDF) (Rs.) of Smt. Minakshi Manna
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No.	Category	Components	Gillnetter
1	Labour	Crew wages (Rs.)	10340 (6783)
2		Crew bata value (Rs.)	200 (1.31)
3		Salary of drivers (Rs.)	-
		Sub-total labour costs (Rs.)	10540 (69.14)
4	Inputs	Fuel cost (Rs.)	2880 (18.89)
5		Auction charges (Rs.)	1015(6.66)
6		Other charges (Rs.)	810 (5.31)
		Sub-total input costs (Rs.)	4705 (30.86)
		Total operating cost (Rs.) (labour cost + input cost)	15245
7	Output	Catch (kg)	280
8		Gross revenue (Rs.)	25385
9	Indicators	Net operating income (Rs.)	10140
10		Capital productivity	0.60
11		Labour productivity	46.67
12		Input-output ratio	0.19
13		Gross value added (Rs.)	20480
14		% GVA to GR	80.68

Note: Figures in parenthesis indicate % to total operating cost

Currently, she continues to marine fishing along with her husband and sons due to a combination of economic necessity, personal interest, and a desire for autonomy and empowerment in her livelihood choices. Sea-going fishing offers her significant potential for income generation, especially in the region where other livelihood options are limited and less lucrative. Additionally, Smt Minakshi has gathered skills and experience that suited marine fishing, making it a practical choice for her livelihood. Understanding the importance of supplementing their income to meet the expanding requirements of their household, they united their efforts in the pursuit of fishing. By combining their strengths and resources, they aimed to secure a more stable financial foundation for their family. This collaborative approach not only addressed their immediate financial needs but also strengthened their bond as partners, as they worked together to navigate the challenges of the fishing industry.

In 2023, Smt Minakshi achieved a remarkable feat when she caught a bumper catch of hilsa of 1000-1200 kg valued at Rs. 5.0 lakhs. This significant accomplishment not only underscored her skill and expertise as a fisherwoman but also brought substantial economic benefits to her family. Such an achievement not only signifies her dedication and perseverance but also serves as a testament to the opportunities and rewards that can be found in the marine fishing profession. Society's perception of fisherwomen participating in marine fishing can vary significantly depending on cultural, social, and economic factors. Traditionally, fishing has been a male-dominated profession in many societies, and women's involvement in sea fishing has often been limited or overlooked. However, recently in many communities, there has been a shift in perception, and fisherwomen are increasingly recognized for their contributions to the fishing industry. Smt Minakshi Manna is one among them, who pioneered in breaking gender stereotypes and contributing to the economic sustainability of her family. She also gained self-esteem and social respect for her skills, resilience, and ability to navigate the challenges of the sea.

She expressed that she was fully satisfied with her present occupation, as she has been involved in this for about 35 years. She perceived that the general business environment and working conditions were good and she was satisfied with her present nature of work. A few challenges reported were the non-availability of washrooms for women and drinking water facilities at landing centres, lack of access to subsidies, and poor access to developmental and welfare schemes. The other socio-cultural and economic constraints reported were poor access to institutional finance, tedious field operations and lack of access to dynamic market information. Gender disparity in benefit sharing, hazards/ health risks, stereotypes regarding women's economic contributions, exploitation, and conflicts were not perceived. Strengthening the infrastructural facilities at the landing centres such as shelters, washrooms and sources of potable water was the perceived need.

Conclusion

Smt Minakshi Manna stands out in marine fisheries, while women in fishing communities worldwide typically focus on pre- and post-harvest roles like marketing and processing. Her dedication contributes significantly to her family's income and supports the social and cultural framework of her community. Her achievements highlight the need for greater recognition of women's contributions within the fisheries sector.

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Author contributions

Conceptualization: JCJ, SSR, SKR; Methodology: SKR; SSR; Data Collection: SKR; Data Analysis: JCJ, SSR; Writing Original Draft: SKR, JCJ, SSR; Writing Review and Editing: SKR, JCJ, SSR; Supervision: SKR

Data availability

The data are available and can be requested from the corresponding author.

Conflict of interests

The authors declare that they have no conflict of financial or non-financial interests that could have influenced the outcome or interpretation of the results.

Ethical statement

No ethical approval is required as the study does not include activities that require ethical approval or involve protected organisms/ human subjects/ collection of sensitive samples/ protected environments.

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