

SOCIO-ECONOMIC DYNAMICS OF FISHING COMMUNITIES IN THE MIDDLE STRETCH OF RIVER GANGA

ANURAG SINGH, BASANTA KUMAR DAS*, SHREYA BHATTACHARYA, PIYASHI DEBROY,
GITASHREE THENGAL AND PRANAYA KUMAR PARIDA

The middle stretch of the Ganga River has historically been a vital fish production zone, supporting millions of riverine fishers and contributing significantly to local economies. The study, conducted in 2022-23 using a mixed-methods approach, covered 1,082 km across 135 fishing villages in 25 districts of Uttar Pradesh and Bihar. A total of 351 fishers were interviewed to assess their socio-economic status, fish catch data, and the challenges they face. During the summer season, Varanasi recorded the highest fish catch per boat at 2.69 tonnes, followed by Kaushambi with 2.45 tonnes, in Uttar Pradesh. The average monthly income of fishers was ₹8,430. The study highlights ongoing challenges such as low literacy, pollution, and destructive fishing practices. Strengthening gear regulations, promoting sustainable methods conserving fish stocks, and supporting community-based fisheries management are essential to improve livelihoods. These findings offer key insights for policy interventions aimed at empowering Ganga fishers and enhancing their role in nutritional security.

Introduction

The river Ganga is regarded as the “lifeline of India” due to its enormous cultural significance as the cradle of civilization. It supports a remarkable wealth of life as it flows through three geographic regions: the Himalayas, the Gangetic Plain, and the Coastal Zone^{1,2}. The river sustains millions of fishers, supporting 10–13 million riverine fisherfolk and around 300 freshwater fish species^{3,4}. Gangetic plain has been divided into three major parts; upper, middle and lower plains⁵. In the middle plains, Ganga receives major tributaries viz. Yamuna, Ghaghara, Gandak and Kosi originating from Himalayas.

The middle stretch of the Ganga River has historically been a principal fish production area, with significant annual fish catches in Uttar Pradesh. Varanasi records the highest catch at 7380 tonnes, followed by Prayagraj (5657 tonnes) and Ghazipur (4566 tonnes) sustaining millions of riverine fishers and contributing significantly to local

economies⁶. Also middle stretch is home to turtles, crocodiles, alligator and Gangetic dolphin along with active breeding sites.

Despite its ecological and economic significance, the fisheries of the middle stretch of the River Ganga face serious threats from habitat degradation, pollution, and overfishing, leading to a decline in fish stocks and adversely affecting fisher livelihoods^{7,8}. Although fishing communities play a crucial role in this region by supporting nutrition to millions, there is a lack of comprehensive information on their socio-economic conditions. Insufficient data on their social, cultural, and economic realities hampers efforts to improve their livelihoods. Understanding these dynamics is essential for formulating policies that promote sustainable livelihood opportunities.

The present study investigates key variables such as educational attainment, household structure, employment status, fishing experience, income generation, and overall livelihood patterns of fishers in the middle stretch of the Ganga.

ICAR-Central Inland Fisheries Research Institute, Barrackpore, Kolkata, West Bengal

* Corresponding author: basantakumard@gmail.com

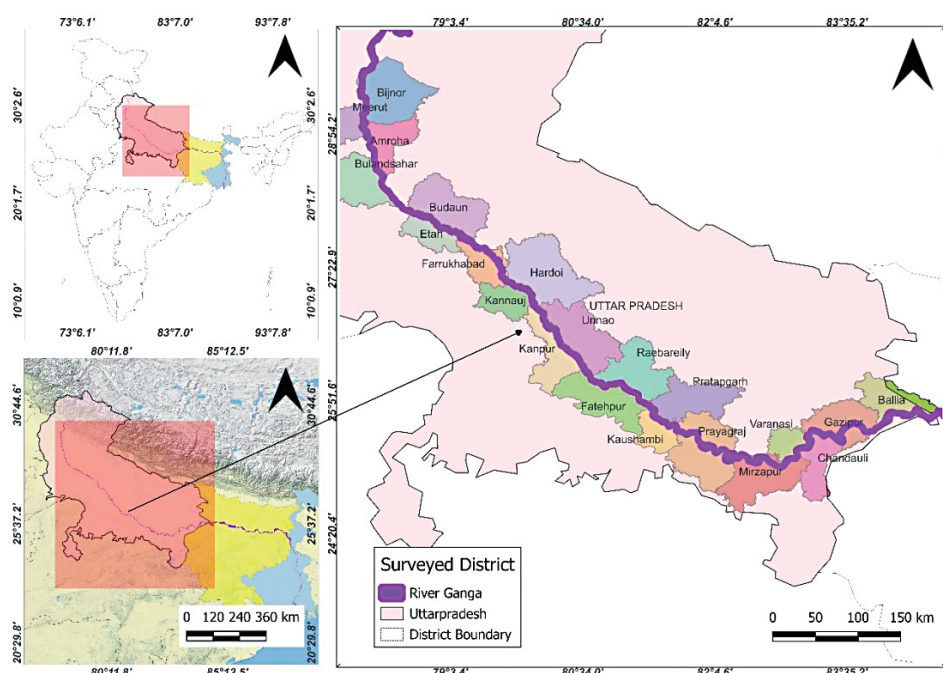


Fig. 1. Sampled villages along middle stretch of river Ganga

Materials and Methods

Study Area: The study was conducted across the middle stretch of river Ganga by using a mixed approach method for both qualitative and quantitative data during 2022-23. A total area of 1,082 km was covered, which comprised 135 fishing Villages from 25 districts of 2 two states that is middle stretch (Uttar Pradesh and Bihar,) was surveyed, and 351 fishermen were interviewed during the survey (Fig 1). The fish catch data were collected through the landing centre and village approach. A combination of methodologies was utilized to gather comprehensive data for this study. These included direct observation, household surveys incorporating semi-structured interview schedules, focused group discussions involving key informants such as community leaders and resource users, and data obtained from secondary sources

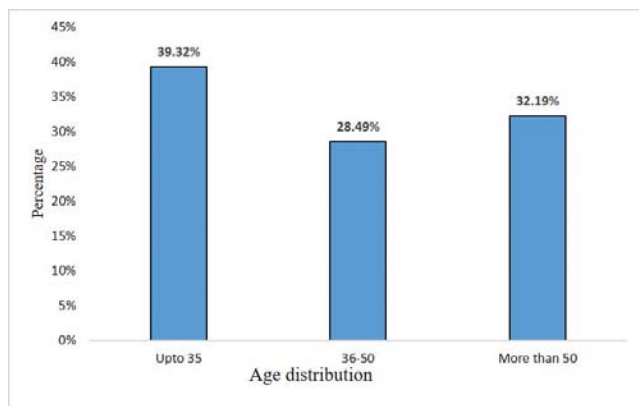


Fig. 1 Age distribution of fishers

such as state-wise fisher population censuses and fisheries records were used to gather information and triangulate results.

Data Analysis: The collected data were analyzed to identify the socio- economic status of River Ganga. This analysis involved a season-wise, and state-wise evaluation of fish catches, utilizing a multistage process that encompassed assessments at landing centres, through village-to-village surveys, and within market settings.

SWOT Analysis

The SWOT analysis for fisheries in the middle stretch of the River Ganga was conducted using both primary and secondary data. Primary data were collected through structured interviews, focus group discussions, and key informant interviews with local fishers, fisheries department officials, and NGOs in selected sites across Bihar and Uttar Pradesh. Secondary data were sourced from government reports, research publications, and institutional records related to fish catch, biodiversity, and river health.

Results and Discussion

Age Distribution: The age distribution of fishers in the middle stretch of the River Ganga showed a fairly balanced across different age groups. A significant proportion of the respondents (39.32%) are aged up to 35

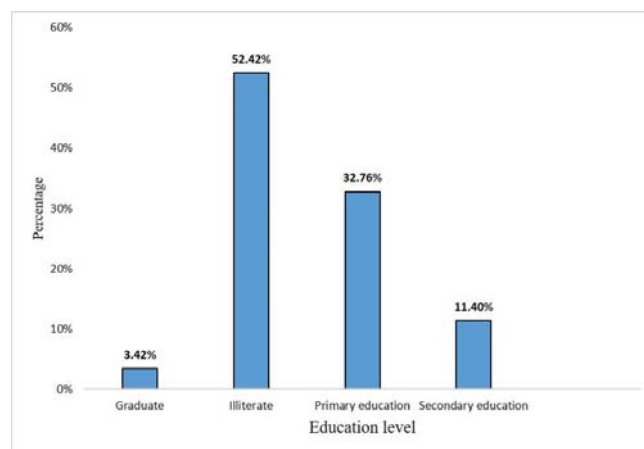


Fig. 2 Education Background of fishers

years, suggesting active involvement of the younger generation in fishing activities. Those in the age group of 36 to 50 years make up 28.49% of the population, while 32.19% are above 50 years of age.

Educational-Status: The educational profile of the fishers indicates a major concern in terms of literacy and access to formal education. A majority (52.42%) of the respondents are illiterate, which may act as a barrier to the adoption of modern fishing techniques, awareness of government schemes, and alternative livelihood opportunities. Around 32.76% have received only primary education, while 11.40% have completed secondary education. Notably, only 3.42% are graduates, showing that higher education is extremely limited among this group. This lack of education highlights the need for adult literacy programs and skill development initiatives.

Fishing Experience:

Fishing appears to be a long-standing occupation for most individuals in this region. Only 21.37% of the respondents have up to 10 years of fishing experience, indicating newer entrants into the profession. A substantial portion (32.19%) has 11–20 years of experience, while 23.08% have been engaged in fishing for 21–30 years. Additionally, 15.67% have 31–40 years of experience, and 7.12% have continued in the occupation for 41–50 years. A very small fraction (0.57%) reported fishing experience between 51–60 years. These figures reflect that fishing is often a lifelong livelihood, with deep-rooted dependence on the river for sustenance.

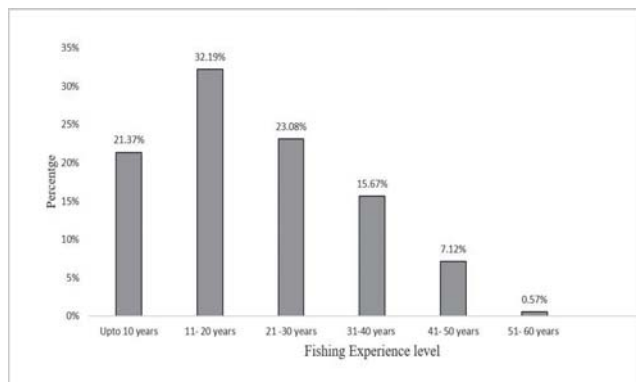


Fig. 3 Fishing Experience

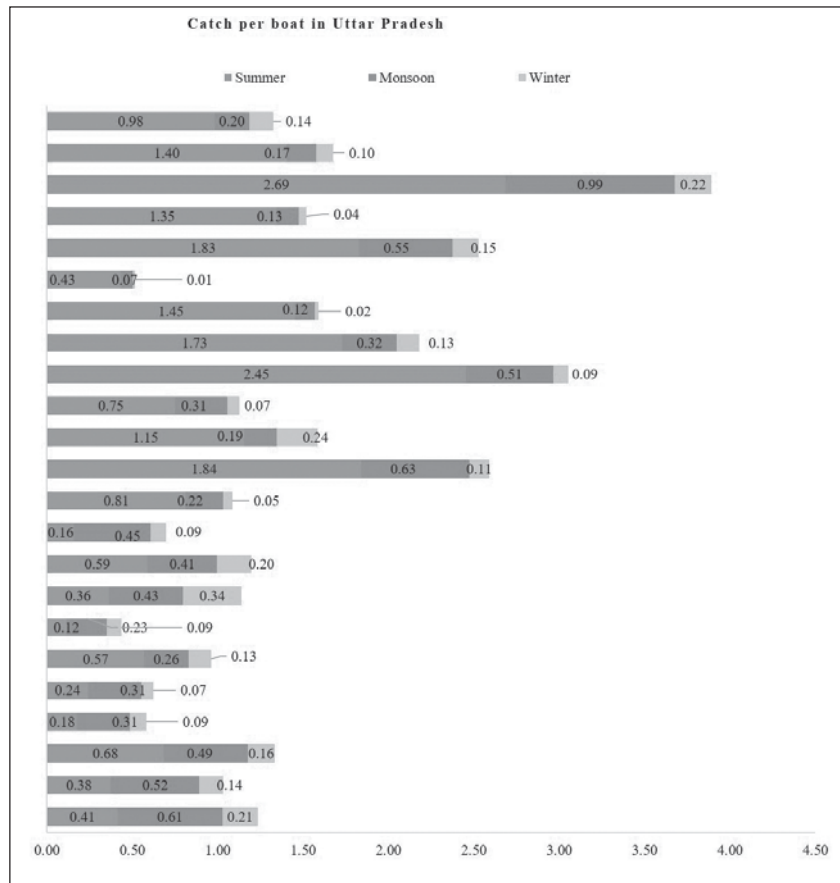


Fig. 4 CPUE in Uttar Pradesh

Catch Per Boat along the Middle Stretch of River Ganga in Uttar Pradesh: During the summer season along the middle stretch of the Ganga River in the districts of Uttar Pradesh, Varanasi recorded the highest fish catch per boat with 2.69 tonnes, followed by Kaushambi at 2.45 tonnes. But, Etah shows the lowest catch at 0.12 tonnes per boat. During the monsoon, Varanasi maintains the highest catch at 0.99 tonnes per boat, while Sant Ravidas Nagar records the lowest catch at 0.07 tonnes per boat. In

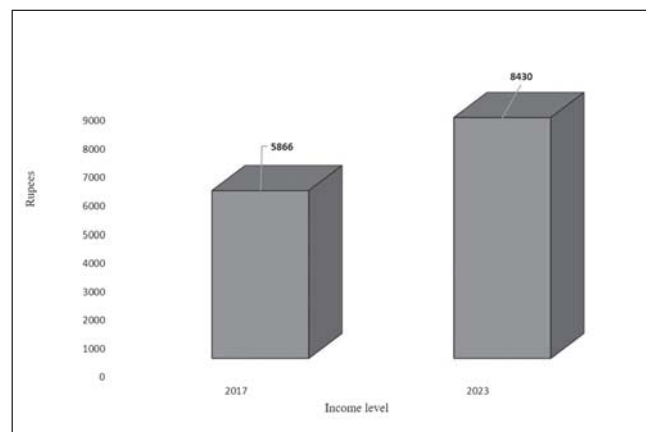


Fig. 5 Income Level of Fishers

winter, despite low catch landing across all districts, Farrukhabad has a relatively high catch of 0.34 tonnes per boat, while Prayagraj records the lowest catch at 0.02 tonnes per boat.

Average Income

The data indicates a notable increase in the average income of fishers in the middle stretch of the River Ganga between the years 2017 and 2023. In 2017, the average monthly income was ₹ 5,866, which rose to ₹ 8,430 in 2023. This reflects a growth of approximately 43.7% over a span of six years⁶.

This increase may be attributed to several factors such as improved fishing techniques, better market access, rising fish prices, or enhanced support through government schemes. However, it is also important to consider the impact of inflation during this period, which may have reduced the actual purchasing power of the fishers despite the increase in nominal income.

SWOT Analysis

A SWOT analysis reveals that traditional knowledge, women's participation in economic activities, and rich fish

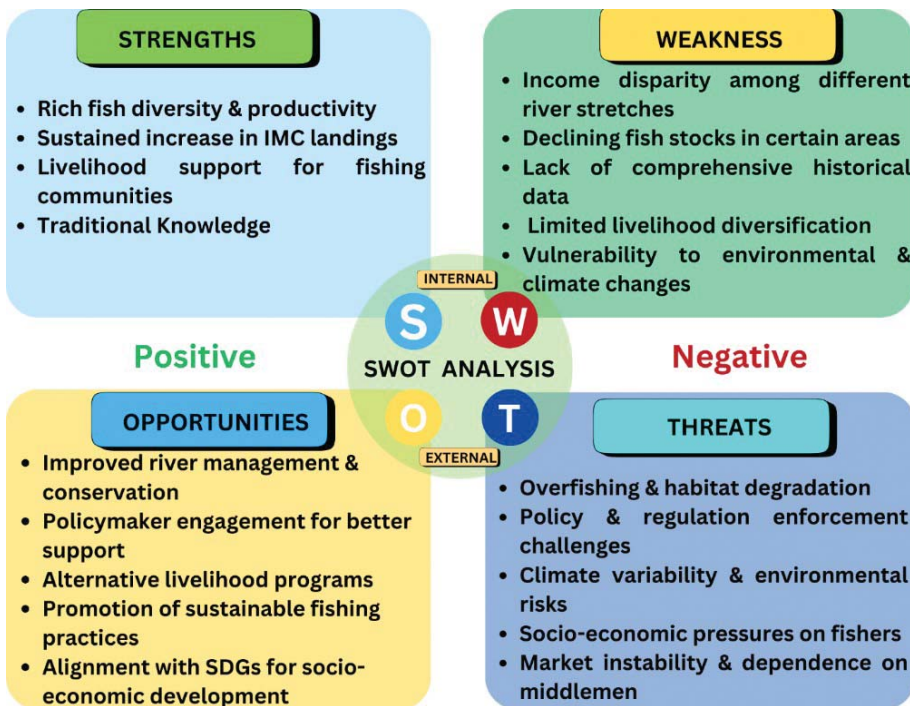


Fig. 6 SWOT Analysis of Fisheries in Middle Stretch of River Ganga

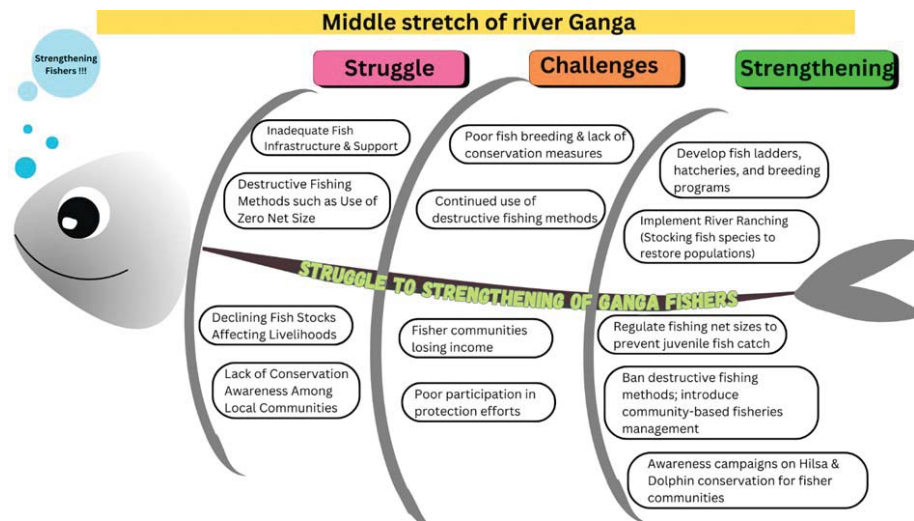


Fig. 7 Struggle to strengthen: A Framework for Fishers in the Middle Stretch of the River Ganga

diversity and sustained increased landings of Indian major carps in the middle stretch of river Ganga are key strengths that can be leveraged to maximize benefits for fishers. However, challenges persist, as fishers remain vulnerable to economic instability, climate change, and limited livelihood diversification.

Despite these challenges, there is significant potential to improve fisher livelihoods through enhanced river management, conservation efforts, awareness programs, and the promotion of sustainable fishing practices. At the same time, addressing critical threats such as destructive fishing, weak policy enforcement, and habitat degradation to secure a sustainable future for fisheries in the Ganga.

Way Forward: From Struggle to Strengthening Ganga Fishers

Fishers in the middle stretch of the River Ganga, especially in areas like Bihar and Uttar Pradesh, have faced many challenges such as falling fish catches, water pollution, frequent floods, and limited access to traditional fishing areas. However, with the help of evidence-based approaches and growing awareness, some positive changes are happening. Many fishers have begun to form cooperative societies to support each other and improve their

incomes. Programs like the National River Ranching Programme, led by ICAR-CIFRI under the National Mission for Clean Ganga, have also helped increase their earnings compared to the previous year.

Furthermore, stricter rules on mesh size, control of harmful fishing methods, more awareness programs, and support for community-based fisheries management are helping to improve the lives and livelihoods of fishers in the middle stretch of the River Ganga.

Conclusion

The study highlights that fishers in the middle stretch of the River Ganga continue to face multiple socio-economic challenges, including low literacy levels, pollution, use of destructive fishing gears and methods, and limited access to modern fishing practices. Despite these difficulties, positive signs are emerging in the form of increasing income levels, growing awareness, and the formation of cooperative societies. Programs like the National River Ranching Programme have also contributed to improving fishers' earnings and livelihood conditions.

Stricter regulations on gear types, promotion of sustainable fishing practices, and support for community-based fisheries management are further helping to strengthen the sector. The present study provides valuable insights that can help policymakers address the real constraints faced by fishers and develop targeted interventions. A detailed cost-benefit analysis would provide a clearer picture of their real economic well-being. By doing so, millions of fishers who depend on the Ganga for their livelihood and who contribute to the nutritional

security of millions can be better supported and empowered.

Acknowledgment

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