

LIVELIHOOD STATUS AND SOCIO-ECONOMIC CONDITION OF FISHERS OF RIVER GANGA

BASANTA KUMAR DAS^{a*}, PIYASHI DEBROY^b, APARNA ROY^c,
SUPRITI BAYEN^a AND HENA CHAKRABORTY^a

The Ganga basin is one of the most populated river basins in the world with 2.82 million fishers dependent on it to sustain their livelihood and nutritional security. The study describes the livelihood patterns of fishers including their social and ecological perceptions across the lower, middle and upper stretches in 24 districts of Uttarakhand, Uttar Pradesh, Bihar and West Bengal. The fishers in the lower stretch had the highest monthly average income of Rs. 7,283. They believe that construction of dams and barrages and overfishing caused by lack of compensation during fish ban period have resulted in serious decline of Ganga fisheries.

The Ganga basin is recognized as one of the most populated river basins in the world which is a rich repository of high biodiversity in aquatic flora and fauna in the world¹⁻³. Numerous fishers are dependent on the fisheries of river Ganga to sustain their livelihood and nutritional security. According to Govt. of India Census (2011) report⁴, the rich riverine ecosystem of Ganga supports around 2.82 million fisher folk. Fish along with fisheries resources of any riverine system provide an important role in improving social and economic status of fishers besides generating employment opportunities⁵. Based on Geological Survey of India's (GSI) information the total number of fishing villages in the Ganga river stretch is 3,795 which covers five states and 47 districts. However, the Ganga river system has experienced habitat degradation of fish fauna due to several anthropogenic

activities which may lead to rapid biodiversity loss including fish stock decline³. Fishing is considered as main occupation of fishers and contributes approximate 70% of total income of family in Bhagirathi-Hooghly stretch of river Ganga⁶. Not much exclusive information has been documented about the socio-economic conditions of Ganga fishers. Insufficient information regarding social, cultural and economic aspects creates difficulties in the improvement of livelihood avenues of fishers. It is therefore, imperative that the socio-economic conditions of fishers who earn their income and livelihood from river Ganga be highlighted and steps be taken for sustenance of their livelihood. Economic and socio-cultural analyses also help managers evaluate the benefits and costs of different activities, prioritize needs, and encourage policies that maximize societal benefits from natural resources. The present study describes in detail social and economic variables such as educational level, household pattern, job opportunity, involvement in fishing, fishing experience, income generation, trend of fisheries and livelihood pattern of fisherman communities at Ganga River stretch. The present study also sheds light on the changes in social and ecological aspects of fishers involved in small scale fisheries of the Ganges.

^a National Missions for Clean Ganga Laboratory, ICAR-Central Inland Fisheries Research Institute, Barrackpore, Kolkata-700120.

^b Economics and Policy Unit, ICAR-Central Inland Fisheries Research Institute, Barrackpore, Kolkata-700120.

^c Training and Extension Unit, ICAR-Central Inland Fisheries Research Institute, Barrackpore, Kolkata-700120.

* Corresponding author: basantakumard@gmail.com

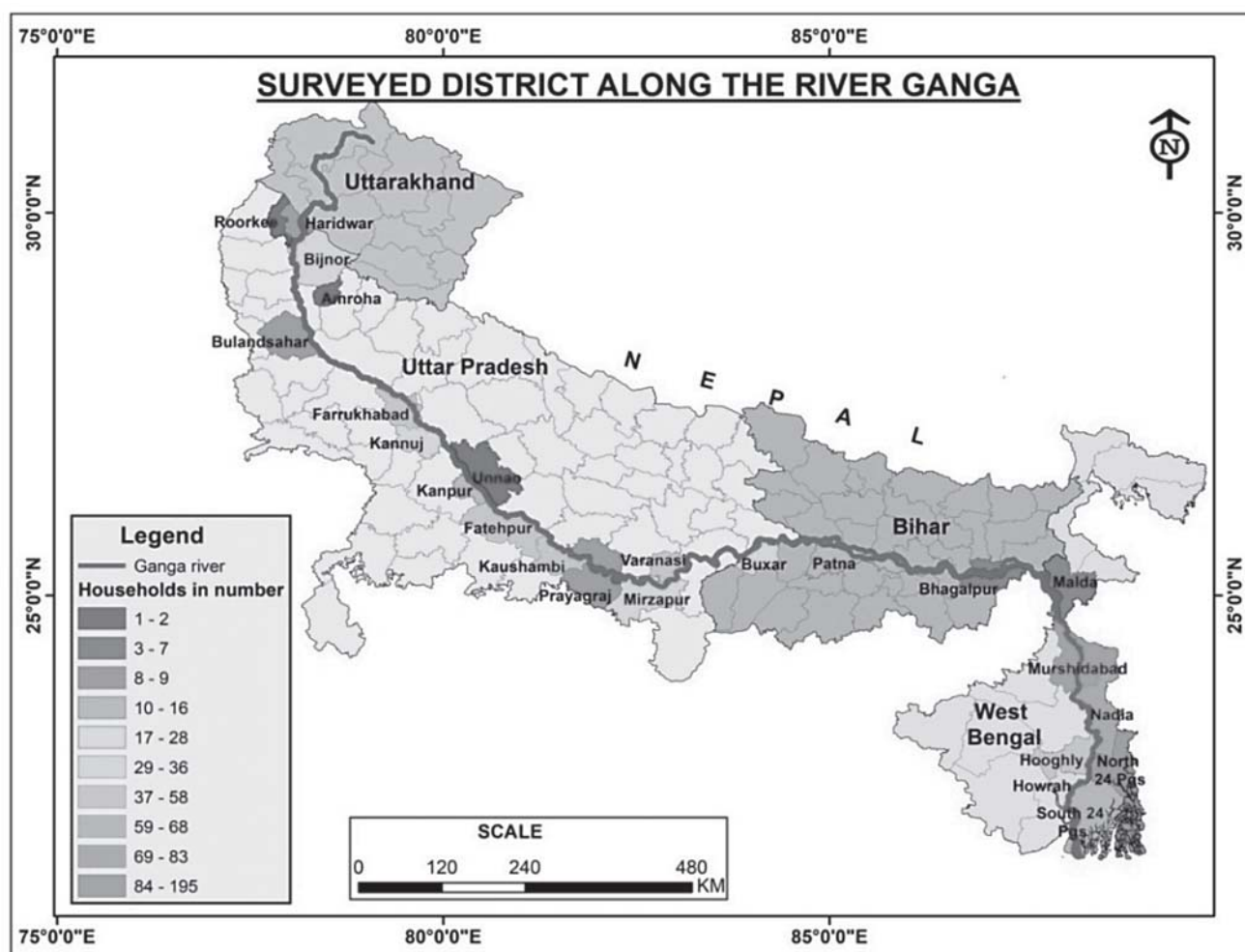


Fig. 1 Surveyed District along Ganga River (Source Das et al., 2022)⁷

Sampling Methodology

Data were collected using mixed approach method during 2017-2019. Focus-group discussions and community meetings were conducted to collect baseline information. Both qualitative and quantitative methods were deployed and followed by the board principle of participatory approaches.

A semi-structured interview schedule was developed and was used to collect data related to socio-personal and socioeconomic variables and the data thus obtained were statistically analyzed. Semi-structured schedules were prepared and finalized after pretesting in some nearby villages.

Study Area

The study was conducted across the lower, middle and upper stretch of the river Ganga in 24 selected districts covering states Uttarakhand, Uttar Pradesh, Bihar and West Bengal. Overall 141 villages (Uttarakhand=5; Uttar

Pradesh=116; Bihar=4; West Bengal=16) were surveyed and a total of 1059 fishermen were interviewed during the survey. A combination of direct observation, household surveys with semi-structured interview schedule, focused group discussion with key informants (community leaders and resource users); and data collected from secondary sources, such as state-wise fisher's population censuses and fisheries records, were used to gather information and triangulate results.

Fishermen Communities of Ganga River

Fishery sector engages millions of fishermen and secures daily livelihood of rural people⁸. The Ganga riverine fisheries are considered as small scale fisheries and provide food, nutrition, poverty alleviation, trade and secure livelihood of million fishers through generating income. The traditional fishing communities are belonging to Hindu and Muslim communities along Ganga basin. Scheduled Caste including Mallah, Kewat and Nisad, and their multiple sub-castes are dominant in Hindu community's fishers⁹. A major

number of fishers almost 60% involved in Hilsa fishery were belonging to the Scheduled Caste known as 'Malo' or 'Jele' community in West Bengal¹⁰.

Age Structure of Fishermen

The average age of fishermen in lower, middle and upper stretch of the river was found to be 44.06, 43.67 and 49.20 years respectively. In all the stretches maximum percentage of fishermen fell in the category of 40 to 50 years of age. Extent of youth (15 to 30 years of age) participation was less in all the three stretches with least youth participation found in the upper stretch. Uncertainty of income from riverine fishery may be the main reason behind it.

Education

The average years of school education received by the fishermen were 3.17 years, 3.55 years and 1.47 years respectively in lower, middle and upper stretch of the river. About 36.21%, 37.3% and 67.44% of fishermen belonged to the category of illiterate in lower, middle and upper stretch respectively. Around 21% of respondents were just literate in the upper stretch while in middle and lower stretch around 25% and 23% respondents respectively were found to have attended high school. Only in middle stretch three respondents were found to be graduates.

Fishing Experience

Fishing experience indicates the degree of association of the fishermen with the fishery. On average, fishermen of lower, middle and upper stretch had 29.04, 24.48 and 29.97 years of fishing experience. The maximum proportion in lower and upper stretch had 21 to 30 years of experience while for the middle stretch the highest proportion of fishermen had 11 to 20 years of experience

Income

Average monthly incomes of the fishermen were Rs. 7283, Rs. 5866, and Rs. 4345 in lower, middle and upper stretch of the river, respectively. In upper stretch, all of the respondents stated to have average income Rs. 5000 per month. Majority of the respondents in the middle and lower stretch reported to have monthly income in the range of Rs. 2000 to Rs. 6000

and Rs. 3000 to Rs. 12000 respectively. Average monthly incomes of fishers were analysed in district wise. Income from fishing activities were estimated Rs. 243, Rs. 196 and Rs. 145 per day per fisherman from lower, middle and upper of the river, respectively. Earlier, income from river fishing was reported as Rs. 40.03 per day per fisherman at the Bihar and Uttar Pradesh stretch of river Ganga¹¹. From the abovementioned study, it is observed the income from middle stretch of Ganga has been increased by Rs. 155.97 over a decadal period.

Occupational Pattern

Fishery is the primary occupation of the respondents. But, income is uncertain and seasonal in nature. In lower stretch 23.33% fishermen dependent on various types of work for earning additional money for their family. Most of the fishermen (25%) had fish selling as their secondary occupation followed by agricultural labourer (17.8%), other labour work (10.7%) and driving (10.7%). In middle stretch, 29.37% fishermen had secondary sources of income. Most of the fishermen were associated in labour work (41%) followed by spawn collection (16%) and agriculture (7.44%). In upper stretch, 85% fisherman engaged with daily labour activities followed by 9% in different agricultural activities and 6% in small business.

Culture and Belief Practices in Fishermen Communities

Fishers follow several traditional rituals based on their ancestor's believes and thus fishing is closely related with spiritualism and cultural beliefs for them. They also offer *puja* towards fishing boat and worship Goddess Ganga regularly as they believe she is the Goddess of the

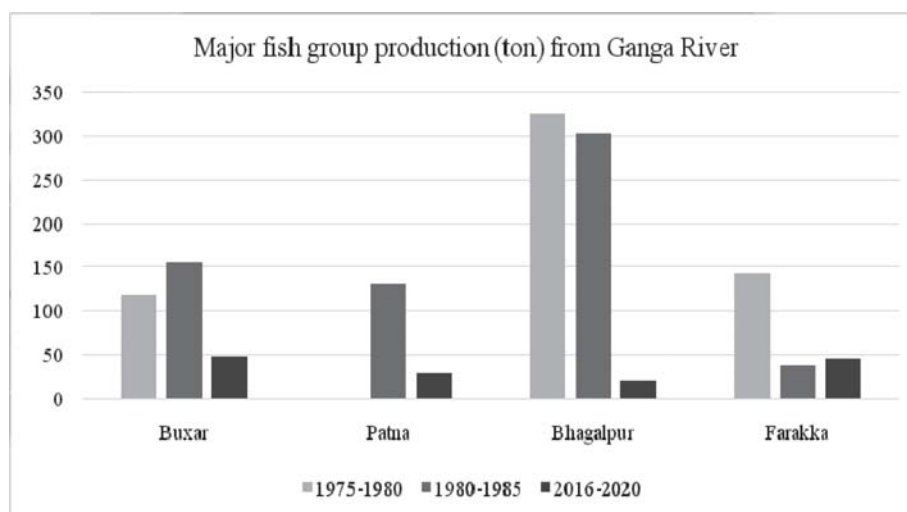


Fig. 2 Production of Major Fish Group from the Ganga River

fishermen communities. This is carried out in *Ganga Dussehra* on *Dashmi Tithi* (10th day) in the month of *Jyeshtha* (June month in the English calendar) in every year by fisherman of lower and estuarine stretch in West Bengal. The fishermen do not venture out for fishing on these particular days.

Changes in Catch Trend in Ganga Fisheries: Perception of Fisher Folk

The economic status of riverine fishers is very poor to moderate condition⁸ and the probable reason is decreasing trend of fish production from inland open waters especially commercially important fish species in past few decades. The important fish species of the river Ganga, specifically commercially important fish group as Indian Major Carps, large catfish, hilsa, exotic carps and local major and miscellaneous fishes have been estimated during 1975 to 2020 and declining trend in Ganga fisheries was observed over the period. Fishermen's perception on decreasing fish production highlighted several issues such as construction of dam and barrages which reduce the water flow and restrict the migration path of fishes, and lack of compensation during fish ban period which promote the fishers for fishing in ban period to maintain their livelihood. Open access fisheries in Ganga River system is another major issue which led to overexploitation of resources and influenced catastrophic changes in landing. Around 72% fishermen of lower stretch (Nabadwip to Fraserganj) of Ganga were of the opinion that fish stock in the river has declined which has impacted their daily livelihood. The traditional fishing communities have taken their own measures for management fisheries through indigenous traditional knowledge. Hence, community-based approaches should be encouraged and responses from the community should be carefully inspected on reducing fish populations and overfishing.

Livelihood Diversification in Fishing Communities

Fishing is an old and traditional occupation involving artisanal and subsistence fisheries followed by one generation to another generation in India. Declining fish catch trend in river Ganga has forced traditional fishers to choose additional job opportunities to sustain their livelihood. Diversification in occupation was noticed like labouring, driving, agriculture or horticulture, fruit selling among the fishers to support the needs of household and minimize the risk factor. Somehow, price fluctuations and over capitalization are also major concern for livelihood

diversification. Fisheries management strategies should be broadly integrated with national development plans, association with credit, education and employment schemes to ensure the appropriate balance between livelihood diversification and resource conservation.

Issues in Fish Marketing for Ganga Fishers

Small scale fisheries provide employment, welfare and provide food security to million people in India. Markets setup is an extra challenge for small-scale fisheries and thus affect the capacity of small-scale fishers for selling the catches and receiving the appropriate price. Fish selling is very much important in right time, at right place as freshness increase the demand of fish as well as contribute good market value. After overnight fishing, it is very much difficult for fishermen to sell the fish in retail market, thus, well market setup and marketing is important in fisheries sector. Thus, making the availability of fishes to the consumers require proper fish marketing channels with excellent management. Generally, quality of small-scale fisheries is always superior and fresh but this does not lead to better prices always. The strategies across the several factors and issues like local catches of artisanal fisheries are not sufficiently differentiated in the market compare to larger scale fisheries or production from aquaculture. There is also a requirement to understand whether the fishing resources can be available in respect to demand, or preferences of consumers as well as could be refocused on other native fish species to make more sustainable utilisation of small-scale fisheries resources. There are no sufficient research works on the supply chain in a marketing system from fishermen to consumers, especially for small scale fisheries. The marketing channels are operated through the involvement of large number of intermediates like *Beparie* and *Aratdar* starts with Fish farmers or Primary market and passes through Secondary market, Tertiary market and Terminal market.

Infrastructure and facilities are important for physical development of markets and marketing fisheries products. Transportation and water connection are the primary components for a proper fish market. Pakka roof, tinshades, pakka platform are often observed as a basic market infrastructure in cities or town area. The facilities for fish selling are provided by local market management committee in rural area. However, washing and cleaning of spaces and disposal of wastes do not meet the hygiene perfectly and below in rural markets thus physical facilities need to be improved to maintain at acceptable standards. The spaces in these markets are generally inadequate for

handling highly perishable commodities like fish. However, ice factories are available in almost all the market area except in domestic fish market area.

Strength, Weakness, Opportunity and Threat (SWOT) of Fishing Community along the River Ganga

The strength, weakness, opportunity and threat of the fishers of Ganga River were analyzed. Basically brave, physical strength, and capacity for hardwork, in fishing and fishery related economic activities are strengths of the small-scale fishing community. Weaknesses are poverty, illiteracy, diversification in fishing, unemployment, poor communication with public and private sectors, lack of infrastructure and capital investment as well as low participation of young age group in the decision making. Vast area of water resources, source of alternative scope for fishing related activities for income generation, ecotourism, awareness generation through co-management practice are the opportunities for sustainable improvement in livelihood of fishing communities. Major threats for fishers are open access fishery, occurrence of natural calamities, use of destructive fishing gear, overexploitation, poor income and poor implementation of policies. Training and skill development programme for fishers for sustainable use of natural resources of the fisheries of Ganga River can help to sustain their livelihood.

Conclusion

Fishing is an important income source contributing to the economy of fishing communities living on the banks of River Ganga. The study was carried out in 141 villages comprising 1059 fishermen from different stretches of River Ganga to assess the socio-economic condition of the fishermen of River Ganga. Present study revealed various aspects of the social as well as the economic status of the fishers' community dependent on the Ganga fishery for their livelihoods. Most of the families of this area are directly involved in fishing to maintain their livelihood. It was found that the literacy status of the fishermen community was poor. Fisheries-related activities form a major part of their total income and play a great role in their livelihood. The creation of alternative livelihood opportunities for fishers is vital for the current situation. Our present study based on the information collected through direct interaction by fisherman and some secondary sources inferred that River Ganga and its tributary contributing to improving fishermen's livelihood and support protein supply to Indian populations.

However, declining fish catch day by day due to various reasons like climate change, pollution, irresponsible fishing, siltation, etc. have become threats to the sustainable riverine fishery. There is also a lack of sufficient baseline information to initiate proper developmental steps and to improve the livelihood of fishermen. Hence, there is an urgent need to take measures to conserve and sustain the Ganga river fishery to secure the life and livelihoods of the millennia. □

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