

Challenges Towards Sustainable Fishing Practices and Post-harvest Management Practices Among River Fisher Communities

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ABSTRACT

This research examines the issues of sustainable fishing practices for livelihood and post-harvest management among fisher communities upstream the Kali River. The study follows a descriptive and analytical research design and is grounded on the primary data which will be gathered using 150 respondents using structured questionnaires and conducting personal interviews, and this will be supported by secondary data in the form of literature sources. The results show that falling fish harvest, credit inaccessibility, seasonal joblessness, and climate change are the most important triggers that negatively impact the socio-economic stability of fisher families. Regarding post-harvest management, a high percentage of fishers rely on instant sale because of insufficient storage and preservation equipment, and hence, a high level of post-harvest losses with majority of the respondents having losses of more than 20 percent. Older preservation techniques like sun drying and smoking are still in use but are ineffective in preserving quality. Additionally, the research identifies a significant knowledge and adoption gap of better post-harvest practices mainly because of lack of access to training, infrastructure and financial resources. These results highlight why there is an urgent requirement that can be achieved through integrated policy interventions such as building cold chain infrastructure, better market connections, financial inclusion, and capacity building programs to minimize losses, improve income, and lead to sustainable livelihood outcomes among fisher communities.

Keywords: Sustainable Livelihood, Fisher Communities, Post-Harvest Management, Kali River, Fish Loss, Awareness, Infrastructure, Livelihood Challenges

1. INTRODUCTION

Fisher communities contribute significantly to the rural economies, food security, and employment, especially in the areas of rivers where livelihoods are strongly associated with natural resources. Kali River, as well as most inland waters, supports a considerable number of small-scale fishers, whose major income source is fishing. Nonetheless, these communities are experiencing various challenges endangering their livelihoods such as reduced fish stocks, environmental deterioration, fluctuations in climate, and a lack of access to financial and

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institutional resources. These limitations do not only impact on their income stability but they also make them susceptible to socio-economic uncertainties.

Besides livelihood issues, post-harvest management is also a pressing issue to fisher communities. Poor handling, absence of cold storage facilities, inadequate transportation and limited knowledge about better preservation methods commonly leads to huge post-harvest losses. This loss will lower the market worth of fish hence lower income and financial strains among fishers. Conventional preservation techniques, although still common, may not be adequate to preserve quality and increase shelf life further exacerbating the situation.

Considering these challenges, there is an increasing demand to consider socio-economic constraints and the post-harvest practices that impact fisher communities in an integrated way. These issues are critical in understanding effective strategies that can result in better livelihood sustainability, lessening losses, and improving the general economic welfare. Thus, the current research is aimed at the investigation of the challenges of sustainable livelihood and post-harvest management among the fisher communities on the Kali River and the elaboration of the main issues to be addressed and the recommendations to be offered to enhance the resilience and productivity of the fisher communities in the Kali River.

2. LITERATURE REVIEW

The aspect of aquaculture in improving livelihood and food security in North-western India. In their work, they pointed out that aquaculture played an important role in providing income, job creation, and food security to rural population. But they also noted that they faced some limitations like the lack of access to modern technology, poor infrastructure, and financial limits, which limited the maximum potential of aquaculture in sustaining sustainable livelihoods (Ansal and Dhawan (2021) studied.

The interface between common natural resources and local people with particular reference to the Chilika Lagoon in Odisha, India. The research highlighted the significance of community-based resource management and commons in maintaining livelihoods. It demonstrated that good governance, participatory strategies, and fair distribution of resources was essential in ensuring ecological balance and enhancement of socio-economic status of supporting communities (Baker Matovu et al. (2025) examined).

How indigenous knowledge can be incorporated into sustainable forest management practices in Indonesia. They found that the traditional ecological knowledge was significant in the climate change adaptation and mitigation efforts. The research found that integration of the systems of local knowledge and contemporary management practices led to the improvement of resource sustainability and the increased resilience of the community, which are valuable insights into the management of natural resource-based livelihoods (Budiman and Oue (2025) researched).

The correlation between socio-cultural practices and food sustainability in the Uttarakhand Himalaya, India. The study emphasized that local traditions, indigenous knowledge, and community-based practices played a significant role in ensuring sustainable food systems. The socio-cultural roots were found to have an impact on resource utilization, conservation

practices, and food security and so traditional knowledge should be incorporated into sustainable livelihood strategies (Chakraborty, Parida, and Singh (2021) studied).

The market value chain dynamics of Chepa, a semi-fermented fish product and how it could help in meeting nutritional deficiencies. The authors found that implementing value addition in terms of processing and better market connections increased the economic benefits to the fishers and also helped in food security. Nonetheless, it also pointed out issues like inappropriate infrastructure, absence of proper storage, and the weaknesses in the value chain that restricted the profitability and greater use of such products (Ferdous et al. (2023) examined).

3. Research Methodology

The research design of the study is descriptive and analytical research design in which primary and secondary data was collected by using structured questionnaires and interviews with 150 fishers who were randomly selected to evaluate their livelihood issues and post-harvest management practices using percentage analysis, tabular presentation and graphical analysis.

3.1 Research Design

The current research uses a descriptive and analytical research design to investigate the issues of sustainable livelihoods and post-harvest management of fisher communities along the Kali river. The design would be suitable in determining patterns, evaluating current circumstances and inferring the links between socio-economic variables and post-harvest results.

3.2 Study Area

The sample was done in some chosen fishing communities that take place along the river Kali, where fishing is a major source of livelihood. This place was selected because it relies on riverine resources and fishers face livelihood and post-harvest issues.

3.3 Data Sources

The study is based on both primary and secondary data. Primary data were gathered at the household level (fisher) and secondary data were taken at the research articles, government reports, and other literature materials to support and substantiate the findings.

3.4 Sample Size and Sampling Technique

There were 150 respondents who took part in the research through a simple random sampling technique to ensure that fisher households were evenly represented throughout the study area. This method assisted in reducing bias and enhancing the data reliability.

3.5 Data Collection Methods

The structured questionnaire and personal interviews were used to gather data. The questionnaire used contained the socio-economic factors, livelihood issues, post-harvest activities, rates of post-harvest losses, and awareness and adoption of better methods.

3.6 Tools and Techniques of Analysis

The responses were summarized by means of percentage analysis and tabular presentation of the collected data. Key findings were also visualized using graphical representations. The data were interpreted by using the descriptive analysis to understand the trends and patterns in livelihood issues as well as post-harvest management practices.

4. Result and Discussion

Fisher communities experience loss of fish, financial difficulties and low livelihoods and post-harvest losses. The lack of awareness and adoption of better techniques is an indication that there should be a better infrastructure and training assistance.

4.1 Socio-Economic Challenges Faced by Fisher Communities

Table 1 shows how the fisher communities along the Kali River are challenged in their livelihoods. The data show the most widespread being the declining fish catch (32%), lack of access to credit (24%), and seasonal unemployment (18.7%). Climate variability effects cause 14.7 and market price fluctuations are the least reported challenge at 10.6. These variations are visually represented by the corresponding figure, whereby the ecological and financial constraints are relatively dominant compared to market-related issues.

Table 1: Major Livelihood Challenges among Fisher Communities

Challenges	Frequency	Percentage (%)
Declining fish catch	48	32%
Lack of access to credit	36	24%
Seasonal unemployment	28	18.7%
Climate variability impacts	22	14.7%
Market price fluctuations	16	10.6%
Total	150	100%

The results indicate that the major dangers to sustainable livelihoods are environmental degradation and resource depletion as indicated by the highest percentage of decreasing fish catch. Financial exclusion also increases vulnerability where fishers are restricted to invest in better technologies and coping strategies.

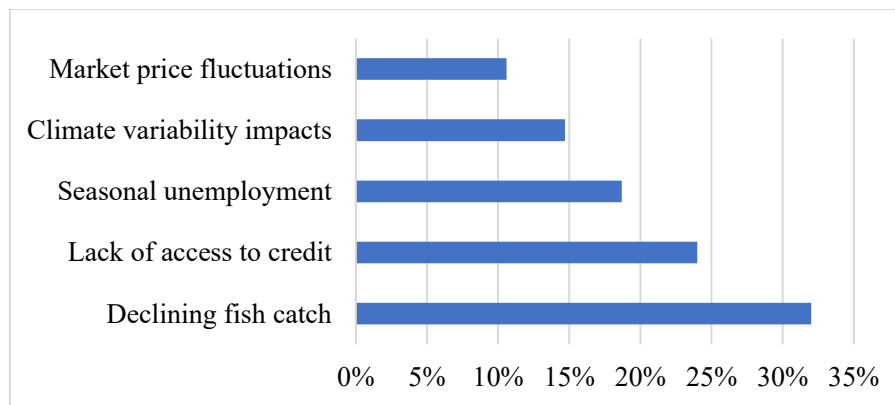


Figure 1: Graphical Representation of Major Livelihood Challenges among Fisher Communities

Seasonal unemployment means that it relies on natural cycles hence income streams are not stable. Even though the percentages of climate variability and price fluctuations are relatively low, they remain very important in the overall livelihood insecurity. The results, together, highlight the necessity of combined interventions that focus on ecological sustainability, financial inclusion, and income diversification.

4.2 Post-Harvest Management Practices

Table 2 shows different post-harvest handling practices used by fisher communities. Most respondents (41.3 %) like immediate sale and no storage, which means that they highly depend on the availability in the market. Ice preservation method takes 25.3 %, and traditional methods include sun drying (17.3 %), and smoking (9.3 %). The least used method is refrigerated storage with a 6.7% result. These practices are graphically expressed in the figure 2 which indicates the overwhelming presence of the immediate sale as compared to other preservation methods.

Table 2: Post-Harvest Handling Methods Adopted by Respondents

Practice	Frequency	Percentage (%)
Immediate sale without storage	62	41.3%
Use of ice for preservation	38	25.3%
Sun drying	26	17.3%
Smoking	14	9.3%
Refrigerated storage	10	6.7%
Total	150	100%

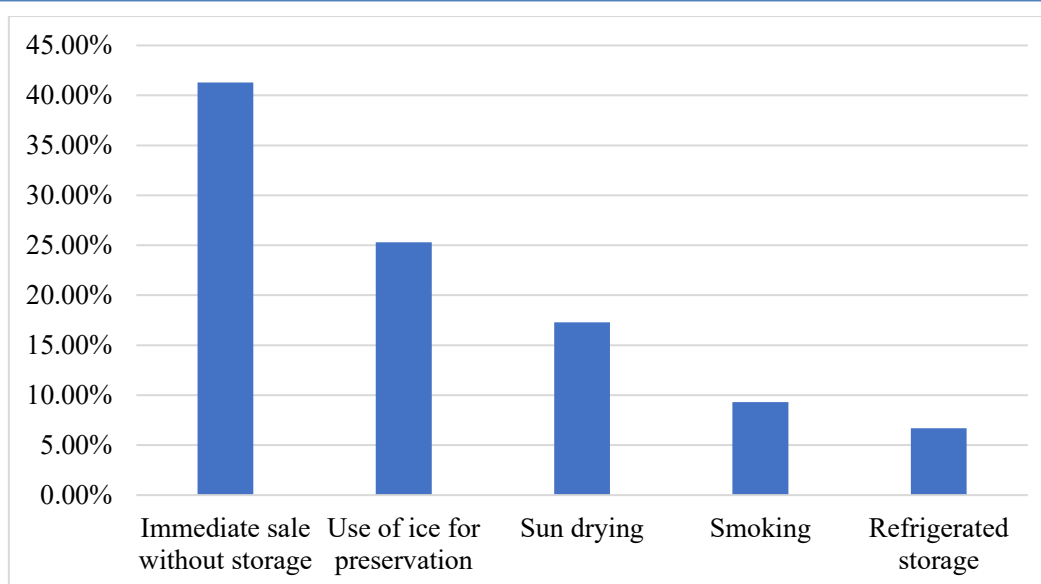


Figure 2: Graphical Representation of Post-Harvest Handling Methods Adopted by Respondents

The findings suggest that there is a high deficiency of proper storage and preservation facilities among fisher communities who are left to sell their produce on the spot and usually at low prices. Not all fishers employ ice, although the proportion is relatively low, implying that there is little access to cold chain facilities. Conventional techniques of sun drying and smoking which still exist, may not guarantee quality consistency and increased value in the market. The low utilization of refrigerant storage points out economic and infrastructural impediments. These results in general indicate inefficiency in after harvest management, which adds to the loss of earnings and a decline in livelihood sustainability, which supports the need of storage facilities and technical assistance.

4.3 Post-Harvest Losses and Their Causes

Table 3 shows distribution of estimated levels of post-harvest losses in fisher communities. The largest percentage of the respondents (34.7%) indicated that they lost between the range of 21% and 30 % and 30.7 % lost between 10% to 20 %. There was a significant 21.3% loss above 30 and only 13.3% responded with small losses less than 10. These variations are visually represented in figure 3, but it is evident that the moderate to high post-harvest losses are the more common than the low-loss conditions.

Table 3: Estimated Post-Harvest Loss Levels

Loss Level (%)	Frequency	Percentage (%)
Less than 10%	20	13.3%
10% – 20%	46	30.7%
21% – 30%	52	34.7%
Above 30%	32	21.3%

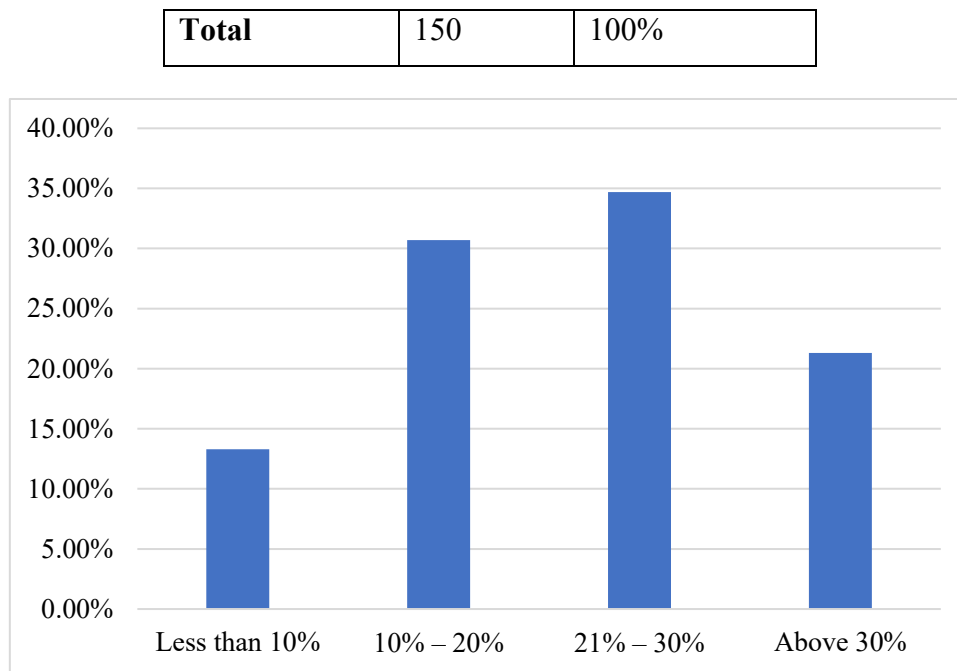


Figure 3: Graphical Representation of Estimated Post-Harvest Loss Levels

The results show that the losses after the harvest are one of the critical issues and most of the fishers reported losses of more than 20%. This is an indication of inefficiencies in storage, transportation and preservation practices. The comparatively large proportion (21.3%) of losses exceeding 30% indicate critical deficiencies in infrastructures and handling methods, which directly affect the income and food security. The percentage of those respondents who have suffered little losses is low, meaning that there is a low use of effective post-harvest strategies. In general, the findings indicate that there is a significant necessity to develop better preservation technologies, enhance market connections, and training to minimize losses and promote livelihoods sustainability.

4.4 Awareness and Adoption of Improved Practices

Table 4 demonstrates the awareness and adherence to better post-harvest methods by fisher communities. Many respondents (45.3%) have no idea about such practices and 36% are aware but have not implemented it. It is not until 18.7% of the respondents said that they were well aware of and proactively changing to better methods. This distribution is graphically represented using figure 4, which clearly shows that lack of awareness is the predominant one as compared to adoption.

Table 4: Awareness and Adoption of Improved Post-Harvest Techniques

Category	Frequency	Percentage (%)
Fully aware and adopted	28	18.7%
Aware but not adopted	54	36%
Not aware	68	45.3%
Total	150	100%

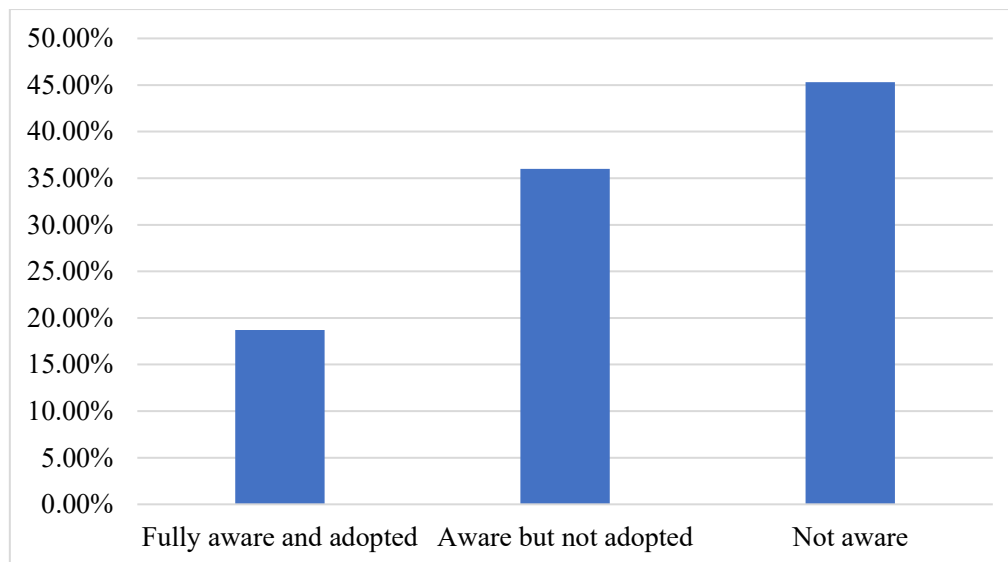


Figure 4: Graphical Representation of Awareness and Adoption of Improved Post-Harvest Techniques

The results indicate that there is a significant gap in knowledge and adoption of post-harvest management. The fact that the proportion of respondents who are either uninformed or incapacitated to embrace better practices is high indicates that they do not have access to training, extension services, and finances. Even the aware, cost, infrastructural and technical support are some of the barriers that prevent implementation. The low adoption (18.7) demonstrates that there is the need to adopt specific awareness campaigns, capacity building and institutional support in order to encourage efficient post-harvest activities and enhance livelihood results.

4.5 Discussion

The results reveal that fisher communities in the Kali River are multidimensional livelihoods that are mostly caused by environmental degradation, reduction of fish catch, and inaccessibility of financial resources. Their income is very unpredictable due to overreliance on natural resources, seasonal unemployment, and climatic variations. These findings are consistent with more general issues regarding the susceptibility of small-scale fishing communities, in which ecological pressures and economic marginalization both limit adaptive potential and sustainability over time.

Moreover, the research indicates that there are great loopholes in post-harvest management as most fishers were dependent on instant sale and incurred significant losses of more than 20%. Low awareness and adoption of better preservation methods further add to the loss of income, and devaluation of the market. These results highlight the necessity to invest more in better infrastructure like cold storage, training programmes and institutional provisions to increase post-harvest, losses and sustainable livelihoods.

5. CONCLUSION

The paper concludes that fish communities in Kali River are experiencing serious and

interdependent issues that affect their livelihoods. The falling fish harvest, inaccessibility of credit, seasonality, and weather unpredictability, all play a role in economic volatility and heightened susceptibility of fishers. Moreover, poor management of post-harvest practices such as immediate sale and inadequate storage and preservation facilities lead to high post-harvest losses, which lead to even lower income. The lack of awareness and uptake of better methods depicts a serious gap in knowledge, infrastructure, and institutional backing. Thus, the combination of the development of cold chain infrastructure, better access to financial services, effective training and awareness programs, and reinforcement of market linkages will help to address these issues. This kind of integrated intervention is necessary to minimize losses, increase incomes and sustainable livelihood outcomes in fisher communities.

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