

## *Role of Fisheries in Poverty Alleviation*

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#### Keywords

Inland fisheries, Aquaculture, Poverty alleviation, Livelihood diversification, Food and Nutritional security

#### *How to cite this article:*

Soni, D., Devi, B. N., Sinha, A. and Sahu, V. 2026. Role of Fisheries in Poverty Alleviation. *Vigyan Varta* 7 (03): 6-13.

### ABSTRACT

India possesses vast and diverse inland fisheries and aquaculture resources that play a crucial role in supporting livelihoods, food and nutritional security, poverty alleviation and economic development. Inland fisheries contribute significantly to employment generation, income diversification and value addition, particularly for rural and marginalized communities, including women. The sector also supports ecosystem services, biodiversity conservation and national economic growth through trade, taxation and contributions to gross domestic product. Despite its immense potential, the effective use of fisheries for poverty alleviation faces multiple challenges, including resource constraints, overexploitation, destructive fishing practices, post-harvest losses and inadequate adoption of ecosystem-based management approaches. Global initiatives such as the FAO's Blue Transformation framework highlight the need for sustainable and inclusive management of aquatic food systems. Addressing these challenges through responsible fisheries management, value addition, livelihood diversification and policy support can enhance the sector's contribution to poverty reduction, food security and sustainable development in

India.

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## INTRODUCTION

India is endowed with rich and diverse inland fisheries and aquaculture resources, including rivers, canals, ponds, lakes, reservoirs, upland lakes and floodplain wetlands. These inland water bodies cover more than 5.8 percent of the country's geographical area and have supported the livelihoods, income and nutritional security of people since time immemorial. They harbor one of the most diverse fish faunas in the world, comprising about 1,035 fish species belonging to 326 genera, out of nearly 30,700 fish species recorded globally. Inland fisheries and aquaculture hold significant social, economic, cultural and environmental value. They are critical for poverty alleviation, food and nutritional security, gender empowerment, cultural services, ecosystem functioning and biodiversity conservation. The equity objectives of inland fisheries and aquaculture emphasize the generation of sustainable economic, biological and social benefits from inland aquatic resources. In addition, the sector makes substantial contributions to the national economy and supports the achievement of the Sustainable Development Goals.

Poverty continues to be one of the most persistent social challenges affecting rural populations in developing countries, including India. It remains a major obstacle to the nation's development efforts aimed at improving the quality of life of its vast population. A considerable proportion of rural households live below the poverty line, making poverty reduction a constitutional responsibility of the Union, State and local governments. As a developing country, India faces widespread malnutrition, unemployment, illiteracy and inadequate healthcare, particularly among women, largely due to low-income levels and entrenched poverty. Poverty

is widely recognized to have a strong gender dimension, with women accounting for an estimated 70 percent of those living in extreme poverty. Despite more than five decades of planned economic development, poverty and unemployment continue to disproportionately affect Indian women.

Small-scale fisheries can, in many contexts, be highly remunerative, and the income generated through fishing and related activities such as fish trading can significantly contribute to poverty reduction among those engaged in the sector. Fishing activities also influence other segments of the rural economy through multiple linkages. These include upstream production linkages involving the demand for fishing inputs and services, as well as downstream linkages related to processing, storage and transportation of fish products. Consumption linkages further arise as fishers and wage laborers spend their earnings on goods and services within the local economy. Additionally, fisheries production can generate tax revenues, thereby enabling increased public investment in rural infrastructure. Consequently, small-scale fisheries play an important role in rural development by creating wealth within the sector that can spread throughout local communities and contribute to the national economy through domestic and international trade.

In recent years, aquatic systems have gained increasing recognition as vital components of food and nutrition security. Their diversity and capacity to deliver ecosystem services and support healthy diets make aquatic food systems a viable and effective solution for enhancing global food security and nutrition, both now and in the future. However, realizing their full potential requires transformative

changes. In 2021, the Food and Agriculture Organization (FAO) launched the Blue Transformation vision to harness the opportunities offered by aquatic food systems to improve food security, enhance nutrition, eradicate poverty and advance the 2030 Agenda for Sustainable Development. The FAO Blue Transformation framework and its Roadmap outline pathways for the sustainable and effective management of living aquatic resources, balancing the goals of food security and poverty alleviation with environmental sustainability.

### **Fisheries Sector: An Overview**

Fish constitute a vital source of dietary protein, micronutrients and essential fatty acids for millions of poor populations worldwide and make a significant contribution to daily caloric intake. Fisheries and fish consumption play a crucial role in combating hunger and poverty in Asia. Fish provide high-quality protein, essential fatty acids, vitamins and minerals, and their lipid content particularly long-chain omega-3 polyunsaturated fatty acids (n-3 PUFA) offer substantial health benefits that are difficult to obtain from alternative food sources (FAO 2024).

Fisheries and aquaculture are key sectors for food supply and income generation in many developing countries, functioning either as primary livelihood activities or in combination with other income-generating practices such as crop farming and livestock rearing. The sector acts as an economic multiplier, especially in marginal and rural regions. In countries endowed with productive natural fisheries or favorable conditions for aquaculture development, fisheries also contribute significantly to national economies through trade, taxation and licensing revenues.

Aquaculture is widely recognized as an effective pathway for poverty alleviation through increased fish production. It is

considered a relatively simple, cost-effective and environmentally sustainable approach. Aquaculture involves the farming of aquatic plants and animals, including fish, molluscs and crustaceans, under controlled or modified environments (DoF, Govt. of India, 2024-25). The farming process includes deliberate interventions such as regular stocking, feeding and protection from predators to enhance productivity. The sector provides livelihoods to rural populations by generating employment and income, thereby reducing poverty through the development and strengthening of community-based approaches (Nune, 2008). Fish farming is increasingly viewed as a tool for economic transformation and poverty reduction, as it addresses key constraints faced by fish farmers, traders, processors and other stakeholders along the value chain. Women are increasingly recognized as capable participants in diverse livelihood activities. There is considerable scope to enhance and expand their access to and adoption of improved technologies among women engaged in fishing, aquaculture and related activities, thereby strengthening their role in the sector and contributing to inclusive development.

### **Employment Generation**

The fisheries sector plays a vital role in employment creation and income generation, while also stimulating the growth of several allied and subsidiary industries. A substantial proportion of economically marginalized populations depend on fisheries as their primary means of livelihood (Biradar & Ayyappan, 2006). In addition to direct employment, fisheries-related commercial activities generate significant economic benefits at local, state and national levels. For instance, recreational fishing supports revenue generation through expenditures on equipment, services and associated enterprises (Arlinghaus & Cooke, 2009). Fishing represents a multifaceted livelihood strategy that contributes to local economic

development, enhances food security and supports poverty reduction in rural regions by creating diverse employment opportunities. Evidence suggests that the integration of fisheries and aquaculture into rural development strategies has yielded positive socioeconomic outcomes. In remote and rural areas, particularly in developing countries, small-scale fisheries are central to household livelihoods and make a substantial contribution to employment and income generation. For many rural households, including those engaged in agriculture, fishing often serves as the primary source of cash income.

### **Income generation**

Fishing and aquaculture activities provide employment and income opportunities to millions of people worldwide, particularly in developing countries. Small-scale fisheries play a vital role in supporting local economies by creating jobs for fishers, processors, traders and workers engaged in related activities. Globally, fisheries and aquaculture are major contributors to income generation and rural livelihoods. The sector generates direct employment across a wide range of occupations, including fishers, fish farmers, processors and traders, as well as in associated industries such as boat building, gear and equipment supply, ice production and transportation services. Many fishery-related activities are organized as small-scale enterprises or family-owned businesses, enabling households to earn income and sustain their livelihoods through fishing, aquaculture, processing and trade. Reducing poverty and ensuring food security have long been central objectives of international development agendas, and fisheries contribute significantly to both goals. Beyond domestic markets, the growing global demand for fish and seafood products creates substantial income generating opportunities through international trade. Many countries derive

economic benefits from fish exports, which generate income for both large enterprises and small-scale producers across the supply chain.

### **Livelihood Diversification**

Fishing serves as a primary livelihood for many coastal communities and plays a crucial role in ensuring economic stability and reducing poverty by providing a dependable source of income. Fisheries and allied activities are central to the social and economic well-being of coastal populations worldwide, supporting livelihoods while strengthening local economies. Coastal communities have traditionally developed fishing practices that are adapted to local ecosystems and emphasize long-term sustainability, thereby balancing income generation with the conservation of marine resources. The fisheries sector offers direct employment opportunities across a wide range of occupations, including fishers, fish farmers, processors, traders, boat builders and other workers engaged in related activities. Income generated through fishing and fish processing supports household livelihoods and contributes to the functioning of local markets. The sale of fresh and processed fish products not only sustains fishing households but also stimulates broader economic activity within coastal regions.

### **Nutritional Security and Food Availability**

Fish represents a critical source of high-quality protein and essential nutrients, particularly in regions where access to alternative protein sources is limited. It plays a significant role in enhancing food security by helping to reduce malnutrition and associated health challenges. Globally, over 25% of the population experiences food insecurity and malnutrition. Fisheries are uniquely positioned to address these challenges. They directly provide billions of people with essential protein and micronutrients while indirectly supporting the

livelihoods of approximately 10% of the world's population (Allison, 2011; Hicks *et al.*, 2019). By ensuring both food availability and nutritional adequacy, fisheries contribute substantially to human health and wellbeing, particularly in vulnerable and resource-constrained communities.

### **Value Addition**

Promoting the processing, packaging, and marketing of fish products can significantly enhance the value of the fisheries sector, generating additional employment opportunities and increasing revenue from fish sales. Through such strategies, governments, businesses, and local communities can stimulate economic growth while strengthening the role of fisheries in livelihoods and rural development. Value addition in fisheries can take multiple forms, including fish filleting, smoking, canning, freezing, and the production of fish-based products such as fish oil, fish sauces, and ready-to-eat meals. Beyond nutritional content, these processed foods offer additional health benefits that contribute to human development, growth, and overall well-being. Moreover, value addition helps reduce post-harvest losses and enhances food security by extending the shelf life of fish products, making them available to consumers over longer periods. Fish byproducts parts of the fish not typically consumed can also be utilized for various purposes, further improving resource efficiency and economic returns within the sector.

### **Revenues from trade, taxation and fishery resource access payments**

Global trade in fish is estimated at approximately USD 100 billion annually. The sector generates a positive trade balance through the export of high-value species from developing countries to developed markets, while imports of lower-cost but often

nutritionally rich fish support food security in developing nations. In addition to trade, the fisheries and aquaculture sector contributes significantly to national economies through taxation and payments for access to fishery resources. In some major fish producing countries, including Mauritania and Vietnam, fisheries and aquaculture account for more than 10 percent of the gross domestic product (GDP), highlighting their economic importance (Gundi, 2012).

### **Contribution to GDP**

Globally, fish production contributes between 0.5 and 2.5 percent of gross domestic product (GDP), which may suggest that the sector plays a relatively minor role in the world economy (Béné *et al.*, 2007). However, in countries with a high dependence on fisheries, the contribution is substantially greater. For example, in Mauritania and Vietnam, fisheries contribute over 10 percent of GDP and account for approximately 50 percent of agricultural GDP. In such contexts, fishery resources are central to economic development, poverty reduction, and food security. These figures underscore the significant role that fisheries and aquaculture can play in national economies, particularly in countries where livelihoods and nutrition are closely tied to aquatic resources.

### **Challenges in using fisheries for poverty alleviation**

**1. The resource constraints:** The finite nature of fishery resources and their susceptibility to overexploitation pose a significant challenge to the sustainable development of fisheries. This limitation affects all types of fisheries whether small-scale or large-scale, marine or inland, in developed or developing countries making it difficult to determine if one category of fishery is more impacted than another (Gupta, M. V. 2006).

**2. Regulation of fishing activities to prevent overexploitation:**

The recent tsunami devastated fishing vessels and gear in many countries, creating an opportunity to support affected fishers in alternative livelihoods, which could have helped reduce pressure on overexploited fish stocks. However, in some cases, generous development aid led to the replacement or even expansion of fishing fleets beyond pre-tsunami levels, increasing pressure on already stressed fisheries.

**3. Enforcement of closed fishing seasons where necessary:**

In India, the government enforces a temporary closure of fisheries for two to three months during the fish breeding season, a measure that has shown encouraging results in protecting fish stocks. For this approach to be truly effective, however, it is essential to provide alternative livelihood opportunities for the fishing communities affected by the temporary suspension of fishing activities.

**4. Mitigation of destructive fishing through the promotion of responsible fishing practices:**

Reducing destructive fishing practices is a major challenge in using fisheries for poverty alleviation. Destructive methods such as blast fishing, poison fishing, and overfishing damage fish stocks and marine habitats, leading to declining catches and reduced incomes for fishing communities. Promoting responsible fishing practices- like using sustainable gear, respecting fishing seasons, and protecting breeding areas- helps conserve resources, ensure long-term livelihoods, and support stable income generation for the poor who depend on fisheries.

**5. Adoption of an ecosystem-based approach to fisheries management rather than a piecemeal approach:**

One of the major challenges in using fisheries

for poverty alleviation is shifting from a piecemeal, single-species or sector-based management approach to an ecosystem approach to fisheries management (EAFM). A piecemeal approach focuses on individual fish species or short-term economic gains, often ignoring interactions between species, habitats, fishing communities, and environmental factors. This can lead to overfishing, habitat degradation, resource conflicts, and declining fish stocks, which ultimately harm poor fishing communities that depend on fisheries for food and income. In contrast, EAFM considers the entire ecosystem, including fish stocks, habitats, biodiversity, climate impacts, and the social and economic needs of fishing communities. However, implementing EAFM is challenging because it requires strong institutional coordination, scientific data, stakeholder participation, and long-term planning, which are often lacking in developing regions. As a result, failure to adopt an ecosystem-based approach can reduce fish productivity and sustainability, limiting the potential of fisheries to contribute effectively to poverty alleviation and livelihood security.

**6. Post-harvest loss reduction and by-catch utilization:**

A key challenge in using fisheries for poverty alleviation is the high level of post-harvest losses and underutilization of by-catch. In many small-scale fisheries, poor handling practices, lack of cold storage, inadequate transportation, and limited processing facilities lead to significant spoilage and quality loss after harvest. These losses reduce fishers' income, food availability, and overall economic benefits, especially for poor and marginalized communities. By-catch- non-target species caught during fishing is often discarded due to low market value, lack of processing options, or

regulatory constraints. This represents a waste of valuable protein and potential income, while also causing ecological harm. Reducing post-harvest losses through improved infrastructure, training in handling and processing, value addition, and better market access, along with promoting the utilization of bycatch for food, fishmeal, or other products, can enhance efficiency and sustainability. However, implementing these measures requires investment, awareness, and policy support, making it a significant challenge in leveraging fisheries for effective poverty alleviation.

## CONCLUSION

Fisheries and aquaculture represent a vital sector for poverty alleviation, livelihood security and nutritional well-being in India, particularly for rural and marginalized populations. The sector generates employment, income and economic linkages across value chains while contributing to national food security, trade and economic growth. Inland fisheries, with their rich biodiversity and extensive resource base, offer immense potential to support sustainable development and achieve equity objectives. However, realizing this potential requires addressing critical challenges such as overexploitation of resources, destructive fishing practices, inadequate enforcement of regulatory measures, post-harvest losses and the lack of ecosystem-based management approaches. Strengthening institutional frameworks, promoting responsible fishing, enhancing value addition, reducing losses and ensuring alternative livelihoods during closed seasons are essential for long-term sustainability. By aligning fisheries governance with ecosystem-based and inclusive development approaches, and in line with global initiatives such as the FAO's Blue Transformation, fisheries and aquaculture can play a transformative role in reducing poverty, ensuring food and

nutritional security and supporting sustainable development goals in India.

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