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Contribution of the Fisheries Sector to the development of Small Scale Industries in Pithoragarh in the Context of Viksit Bharat

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ABSTRACT:

The fisheries sector has emerged as a very lively contributor in rural development and economic diversification in these gorgeously endowed freshwater realms. The study attempts to probe into the issue of the fishery sector's contribution to industrial development at the smaller level of Pithoragarh, generally considered a hilly district of Uttarakhand, vis-a-vis Viksit Bharat: India on the path of becoming a developed nation by 2047. With its rich aquatic biodiversity and a deep focus on inland and cold-water fisheries, Pithoragarh is ideal for industrial activity in the fishery domain, such as fish farming, processing, packaging, feed, cold chain, and logistics. The study underlines how fisheries promote entrepreneurship development at the local level, together with generating employment and developing value chains mainly for the youth and women. It further reviews and analyzes various government schemes, institutional supports, and emerging market linkages that contribute to making micro and small-scale fishery enterprises more sustainable. By linking fishery with the small-scale industry ecosystem, it becomes an avenue for employment in rural areas and a remedy to migration, thus fostering inclusive growth on the account of the Viksit Bharat agenda. Hence, focus has been placed on strategic investments, skill development, and infrastructure to unleash the transformation potential of the sector.

Keywords: Fisheries sector, rural development, economic diversification, Micro and small-scale industries, Value chain development.

INTRODUCTION:

India finds itself in a rapidly evolving sea of change and development, and hopes to attain the status of a developed nation by 2047, clearly envisioned through the national initiative called "Viksit Bharat." Such a vision requires others as economic growth, i.e., development that is inculcative, sustainable, and decentralized. A significant part of this change is about harnessing region-specific strengths and resources. In this respect, due to being one of the most promising engines for rural upliftment, economic diversification, and entrepreneurial activities, the fisheries sector contributes to the ecological but economically underdeveloped regions.

Pithoragarh, one of the districts in the Kumaun division of Uttarakhand, is one such region. The district is generally full of hilly areas, thus, it is situated in the lap of the Himalayas and has a reputation in the past for agriculture, beauty, and cultural heritage. Apart from a touristic attraction, a great potential for inland and cold water aquaculture exists in large-scale freshwater bodies like rivers, lakes, and reservoirs, which remains mostly untapped. Considering the increasing climate-related challenges to traditional

livelihoods such as agriculture and forestry to climate change, land fragmentation, and migration, fisheries represent an alternative and low-risk income option for the local population.

There has been a recent change in government prioritization wherein increasing importance is being given to policy thrust, financial support, and capacity building towards up gradation of fisheries infrastructure and production in hilly regions, including Pithoragarh food. The evolving support system has made it increasingly possible to see the fisheries sub-sector not only as real as a part of the micro, small and medium enterprises sector. The inclusion of fisheries in small-scale industrialization brings with it a broad array of value-added processes such as fish farming, hatchery culture, and feed milling facilities, fish processing, packaging, cold storage, and distribution logistics. All of these put together create an industrial ecosystem that creates jobs, induces innovation, and builds local economies. Interestingly, such fishery enterprises can empower rural women and youth, who are frequently excluded from the formal economy. Through entrepreneurship promotion, diminished seasonality in out-migration, and improved income stability, fisheries could form a foundation for pro-poor rural growth. Furthermore, the industry adds nutritional security, an increase export opportunities, and promotes sustainable livelihoods and, therefore, aligns with wider Sustainable Development Goals (SDGs) and national development policies. This study is thus based on the imperative of critically analyzing the fisheries sector's role in driving small-scale industrialization in Pithoragarh, as well as its mapping against the overall objectives of Viksit Bharat@2047. This study examines the current status, prospects, and challenges of the fishery sector in the district. It also assesses the influence of government schemes like the Pradhan Mantri Matsya Sampada Yojana (PMMSY), institutional arrangements, and market linkages that play a crucial role in the creation of a sustainable fishery-based MSME system.

REVIEW OF LITERATURE

The fisheries sector has long remained a motivator for rural development, livelihood security, and small-scale industrial growth, especially in the ecologically sensitive and economically vulnerable regions of Pithoragarh, with the backing of a large volume of academic and institutional literature. This review thus attempts to bring together some expositional research on different aspects of fisheries for the promotion of micro and small enterprises, entrepreneurship, value chain development, and inclusive growth.

Kumar, A., & Tiwari, S. (2021) "Prospects of Cold Water Fisheries in Uttarakhand," the authors tried to understand the ecological and economic potentialities of cold-water fisheries, more particularly trout farming. They maintain that the resources of hilly districts such as Pithoragarh are conducive for the setting up of sustainable aquaculture. They stress incentives from the government, such as subsidies, training, and hatchery infrastructure, to motivate the youth and community-based fish farming as a mode of livelihood. Cold-water fisheries are thus projected as a micro-enterprise to generate marginal rural incomes and ease migration pressure.

FAO (2018) The Food and Agriculture Organization (FAO), in its report "The Role of Fisheries in Rural Livelihoods," confirms the significance of fisheries in providing food and income security, particularly in remote or underdeveloped areas. It highlights that small-scale aquaculture and fisheries play a vital role in empowering rural women and marginalized communities. The report also highlights the establishment of fish-based value chains and integration of cold storage, processing, and marketing to support micro-enterprises.

Planning Commission (2014) Planning Commission's "Development Challenges in Hill States" report identifies recurring problems such as narrow livelihood opportunities, high emigration, and poor industrial activity in Uttarakhand, among other states. Economic diversification through small-scale industries such as fisheries is its suggested remedy. The report sees inland aquaculture as the potential to give new life to rural economies through the incorporation of resource-based micro-enterprises into the local development agenda

Singh, D., & Joshi, P. (2019) Singh and Joshi discuss the unexploited status of women in fisheries in their article. Their findings indicate that women in such hill districts as Pithoragarh are getting involved in aquaculture operations especially in fish feed production, pond maintenance, and post-harvest care. The research maintains that empowering women self-help groups (SHGs) in the fisheries sector can make rural livelihoods more sustainable and foster inclusive industrial growth.

NABARD (2020) in its report "Rural Entrepreneurship through Fisheries" highlights a number of case studies from the North Indian hill states. These case studies illustrate how fish farming, particularly in backyard and cooperative forms, has assisted in establishing sustainable rural businesses. The report emphasizes the need for access to finance, training, and institutional support in order to scale up fishery-linked small industries and offer economic substitutes to traditional agriculture.

Borthakur, A., & Nath, P. (2018) the present research centers on the development of sustainable value chains in inland fisheries by decentralization of processing and marketing. Backward and forward linkages play a key role in rendering fishery-based small-scale industries viable, as noted by Borthakur and Nath. They suggest a combination of cold storage, value-added products, and electronic marketing to facilitate micro-enterprise development in rural and hilly regions.

Uttarakhand Department of Fisheries (2023) The "Cold Water Fisheries Development Plan" provides the state government's overall policy guidelines to promote the fisheries industry in high-altitude districts. It incorporates proposals for establishing fish hatcheries, feed plants, and marketing societies in districts such as Pithoragarh. The report has characterized fish farming as a potential small-scale industry that can generate employment, particularly for local youth.

ICAR-DCFR Bhimtal (2020) The ICAR-DCFR study provides a detailed assessment of coldwater aquaculture in Himalayan states. It places species like rainbow trout and golden mahseer on the economically viable list for hill aquaculture. It suggests an improvement in scientific research, extension services, and infrastructure to support small fishery entrepreneurs in regions such as Pithoragarh.

World Bank (2019) The World Bank report examines how India's vision for development can align fisheries and other rural enterprises. The report encourages convergence of fisheries development with broader national missions such as Viksit Bharat@2047. The report recognizes the need for investment in infrastructure, market access, and ecosystem-based methods to make scalable fishery-based MSMEs viable.

OBJECTIVES OF THE STUDY

1. To assess the current status of the fisheries sector in Pithoragarh.
2. To examine the potential of fisheries as a driver of micro and small-scale industrial development in Pithoragarh
3. To analyze the effectiveness of government schemes and institutional support mechanisms for fisheries business.

RESEARCH METHODOLOGY

This proposed research system, classified as exploratory and descriptive, is being carried out examining the role of the fisheries sector in promoting small-scale industry in the Pithoragarh district within the context of the Viksit Bharat@2047 Initiative. The study is fully secondary and does not include any primary data collection or the use of statistical tests and tools. Employing a qualitative and analytical approach, the study has been confined to thematic analysis and policy interpretation to draw insights from a variety of authoritative sources. These include government publications from the Ministry of Fisheries and the Department of Fisheries, Government of Uttarakhand, institutional reports from FAO, World Bank, ICAR-DCFR Bhimtal, and NABARD; relevant academic literature; and scheme-related policies such as the Pradhan Mantri Matsya Sampada Yojana (PMMSY). Further, fisheries annual reports, census data, and economic surveys of Uttarakhand have been referred to for statistical data. The gathered information has been organized into themes concerning major issues such as value chain development, employment generation, and the promotion of entrepreneurship. Content analysis is used to interpret the relevant texts and align the results with the national goals of Viksit Bharat@2047. Even though the unavailability of field data stands as a limitation for micro-level empirical validation, the study offers some useful conceptual and policy-level insights based on all data available till 2024.

ANALYSIS AND INTERPRETATION

1. Current Position of the Fishing Industry in Pithoragarh

The fishing industry in Pithoragarh district, which is situated in the eastern Himalayan region of Uttarakhand, is increasingly emerging as an important livelihood source and a potential sector for micro and small-scale industrial growth. Even as a generally hilly and far-flung district, Pithoragarh has a rare blend of natural resources such as perennial rivers, mountain streams, and high-altitude cold-water bodies that render it ecologically favorable for inland and cold-water aquaculture operations. The sector, which has remained untapped in the past, is now being actively encouraged with government and institutional support as a part of overall rural development and self-employment initiatives framed with the vision of Viksit Bharat@2047.

Based on the 2022–23 fisheries production figures, Pithoragarh recorded a fish yield of around 108.438 metric tonnes (MT), a noteworthy figure given the district's hilly terrain and infrastructural constraints (ixamBee, 2023). Although the production level still falls short of that of plains districts such as Haridwar or Udham Singh Nagar, it shows a rising trend and points towards increased awareness and interest in aquaculture. The growing production marks the step-by-step conversion of fisheries from a low-grade activity to a future source of income as well as food security for rural families.

One of the pivotal initiatives that helped pull this off has been initiated by the Uttarakhand Council for Science and Technology (UCOST). Their scheme aimed at using natural water bodies in Pithoragarh for community-based fish culture. Under this program, 15 scientifically developed fish ponds were developed in specific rural locations to allow the local farmers to cultivate around 249 quintals (24.9 MT) of fish from a single cycle of production. The crops grown were Common Carp, Rohu, and Rainbow Trout, showing diversification and adjustment toward both warm water and cold water species (UCOST, 2023). This model not only proved the technical viability of aquaculture in hilly areas but also promoted decentralized entrepreneurship by engaging small and marginal farmers. Adding strength to this change is the active role taken by the Trout Farming Vipadan Evam Prabandhan Sehkari Mahasangh Ltd, a state-level cooperative federation to upscale trout farming operations. This organization has already mobilized 25 trout farm clusters and plans to scale up to 50 clusters in the district. Their integrated approach involves the establishment of trout raceways (narrow flowing water courses appropriate for trout rearing), dissemination of quality trout seed and feed, and establishment of supportive infrastructure for cold-chain logistics, value-added processing, and marketing (UKCDP, 2023; Cooperative.uk.gov.in, 2023). These innovations are central to creating both backward linkages (such as input supply and hatcheries) and forward linkages (such as market access and processing units), which are important for developing a sustainable micro-enterprise system in the fisheries sector.

One critical scientific development has also been brought forth by the Indian Council of Agricultural Research - Directorate of Coldwater Fisheries Research (ICAR-DCFR), which is headquartered at Bhimtal. The institute implemented a pilot project in the far-flung tribal village of Sarmoli in Munsyari block, where rainbow trout culture was initiated for the first time. The project was intended to provide tribal and disadvantaged communities with an alternate, environmentally friendly source of livelihood and minimize reliance on conventional, climate-vulnerable activities such as agriculture and forestry (ICAR, 2020). The success of these demonstration projects is setting the stage for the dissemination of knowledge, building capacity, and replication of best practices across the district.

Overall, Pithoragarh's fisheries sector is gradually transforming from a subsistence-level endeavor to a semi-commercial venture based on institutional support, community involvement, and natural resource maximization. While there are still issues of market access, infrastructure deficit, and climatic limitations, the new model of fisheries-led development is increasingly playing a key role in rural diversification of livelihoods, particularly among women and youth. By dovetailing into national schemes such as the Pradhan Mantri Matsya Sampada Yojana (PMMSY) and state-specific aquaculture missions, Pithoragarh's fishery industry is well-placed to meaningfully contribute to employment generation, migration check, and micro-industrialization—thus facilitating the inclusive development agenda of Viksit Bharat@2047.

2. The potential of fisheries as a driver of micro and small-scale industrial development in Pithoragarh

Pithoragarh, a mountainous district in the Kumaon region of Uttarakhand, enjoys natural water features in the rivers Kali, Gori, and Saryu, besides many high-altitude lakes and reservoirs built by man. These gifts of nature provide a substantial opportunity for harnessing fisheries as a catalyst for MSI development. The district has over 850 hectares of water surface suitable for fish culture under Uttarakhand's Fisheries Department. At present, only about 35-40% of the water areas have been used. The cold-water species, such as trout and snow trout, considered dominant for this region, are highly marketable and thus more viable for value-added processing and exports. Such fisheries promise job creation and income diversification. Production in a small-scale fish farm of 0.5 ha ranges from 1.5 to 2.0 tons of fish per annum and a gross income of ₹3-4 lakhs per cycle. According to government estimates, fish farming provides one full-time job per hectare of farming and generates several seasonal jobs during the breeding and harvesting seasons. In addition to this, if fish farming is integrated with agriculture and livestock rearing, it assists rural households to earn an additional 20-30% annually.

Hence, the fisheries sector enjoys strong forward and backward linkages with industries in the MSE sector. These include fish feed production, ice plants, cold storage, fish processing, packaging, and transportation logistics. It is good to know that a small fish feed plant producing 200 kg/day is sufficient for 15-20 small farmers, with a revenue of ₹1-1.5 lakhs per month through charging. However, the district faces its infrastructural shortcomings, with only two government fish farms in operation, while the cold chain infrastructure is not yet developed. This poses 15-20% losses in post-harvest fish production.

A customized SWOT analysis of Pithoragarh fisheries presents a long list of strengths, weaknesses, opportunities, and threats that require skillful handling to unleash its real potential for micro and small-scale industrial development. On the strength side, the district enjoys a naturally agreeable climate, freshwater dearth being almost unheard of in a place that boasts hundreds of perennial rivers and lakes up in the hills, an excellent setup for the commercial cultivation of worthy cold-water fish species like trout and snow trout. While providing for natural fish biodiversity, these conditions help keep the inputs in aquaculture low by way of reduced artificial temperature control and minimal costs toward water sourcing.

Coming to the weaknesses, limited technical know-how by the youth and farmers in rural areas constrains the sector. It also suffers from an inadequate training infrastructure on one hand, and on the other, the lack of an entrepreneurial outlook vis-à-vis fishery. Further, poor physical connectivity in remote blocks, especially at higher altitudes, in some cases, limits timely access to markets, hatcheries, and cold storage facilities. In the absence of good post-harvest infrastructure, post-harvest losses can go as high as 15-20%, discouraging any large-scale investment from both private and community stakeholders.

3. The effectiveness of government schemes and institutional support mechanisms for fisheries business

The Pradhan Mantri Matsya Sampada Yojana (PMMSY) launched in 2020 with a total outlay of ₹20,050 crore, is a flagship scheme to facilitate sustainable and inclusive growth of the fisheries sector. Its major targets are to improve fish production, double the income of fishers, and promote entrepreneurship. With this scheme, the beneficiaries are provided with financial help of 40% (general category) and 60% (SC/ST, women entrepreneurs) towards the development of infrastructure such as ponds, hatcheries, circulatory aquaculture systems (RAS), and bio-floc units. PMMSY further aids the development of fish feed mills, cold storage, ice plants, and transport and processing facilities. In hilly regions such as Pithoragarh, the scheme has made small-scale fish farming enterprises and fish seed production, feed milling, and fish drying businesses possible for numerous beneficiaries—young people and Self-Help Groups (SHGs). These interventions are in support of end-to-end value chain development and allow micro-entrepreneurs to move up the value chain from primary production to processing and marketing.

the effectiveness of implementation is still patchy. While the scheme has extended capital support to quite a few entrepreneurs of Pithoragarh, numerous small farmers are unaware of the subsidies and assistance available, particularly in far-flung rural areas. The same is the case nationally, where, as of FY 2023–24, only around 30–40% of eligible beneficiaries in hilly states availed themselves of PMMSY benefits. Documentation obstacles and procedural hold-ups further limit access to financial assistance on time. One major constraint is the lack of trained fisheries experts and extension officers at the block level, which restricts the coverage and extent of capacity building.

RESULTS AND CONCLUSION

The existing fish seed hatcheries must also be upgraded and private investment should be encouraged for the further development of fish seed hatcheries to meet the increasing demand for good-quality fish seed. Equally important is the issue of credit and financial inclusion. Small-scale fishers and entrepreneurs are to be made aware of institutional credit schemes such as the Kisan Credit Card (KCC) for Fisheries and the Pradhan Mantri Mudra Yojana. The Government must also contemplate granting special subsidies or interest subvention schemes to incentivize investments into fish farming and allied sectors. Training and education should play an essential role in capacity building. Regular workshops, exposure visits, and technical training programs should be conducted for fish farmers to modernize the aquaculture techniques they employ, including biofloc and circulatory aquaculture systems (RAS). Digital literacy among rural fishers should also be promoted to empower them with the ability to access online markets and perform financial transactions with ease.

Local fish markets require improvement for value addition and enhanced market linkages. The fishers shall be linked with cooperative societies and digital trading platforms such as e-NAM (National Agriculture Market) for fair prices and to limit the dependence on middlemen. Support to micro and small fish processing units for drying of fish, pickle, and other value-added products would assist in income diversification. Better coordination between the district fisheries departments, local self-governments, and cooperative societies must take place for the smooth implementation of schemes. The development of fisheries should then be integrated into rural and regional planning on a larger scale under the Viksit Bharat initiative. Lastly, the promotion of research and innovation is crucial. Association with academic and research institutions should be established to study new aquaculture species suitable for high-altitude conditions and better fish disease management strategies. Promoting community-based research models can lead to better adoption of technologies suitable for local requirements.

The fisheries sector in Pithoragarh has become an emerging potential catalyst for the development of small-scale industries under the ambit of the Viksit Bharat vision. The study reveals that fisheries contribute not only to nutritional security and the generation of employment but also serve allied industries such as fish processing, feed making, transportation, cold storage, and marketing services. Development of rural entrepreneurship and inclusive development takes center stage if one talks about fisheries, with due considerations given to policy analysis through secondary data, institutional support, technology intervention, and local participation.

The district, located uniquely geographically, places the freshwater resources and agro-climatic conditions at the forefront of opportunities for expansion and experimentation in aquaculture. However, limited awareness of technological possibilities among fish farmers, infrastructural dearth, market access constraints with diminished credit penetration, and financial support have acted as restrictions to the growth of the sector. Nevertheless, in all these backgrounds, initiatives by the Government of India such as Blue Revolution and PMMSY, are building an able framework for the sustainable development of the fisheries envisaged under the Viksit Bharat Mission.

REFERENCES:

Kumar, A., & Tiwari, S. (2021). *Prospects of Cold Water Fisheries in Uttarakhand*. Journal of Mountain Agriculture, 18(2), 112–118.

Planning Commission. (2014). *Development Challenges in Hill States: A Study of Special Category States*. Government of India.

Food and Agriculture Organization. (2018). *The Role of Fisheries in Rural Livelihoods*. FAO Fisheries and Aquaculture Circular No. 1093.

Department of Fisheries. (2022). *Annual Report 2021–22*. Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.

National Bank for Agriculture and Rural Development. (2020). *Rural Entrepreneurship through Fisheries: Case Studies from North India*. NABARD Publications.

Singh, D., & Joshi, P. (2019). *Women and Fisheries: Untapped Potential in Uttarakhand*. Journal of Rural Development Studies, 35(4), 66–72.

Borthakur, A., & Nath, P. (2018). *Sustainable Value Chains in Inland Fisheries: A Rural Development Approach*. Indian Journal of Fisheries Economics, 27(1), 45–53.

Uttarakhand Department of Fisheries. (2023). *Cold Water Fisheries Development Plan 2023–2027*. Government of Uttarakhand.

ICAR-Directorate of Coldwater Fisheries Research. (2020). *Coldwater Aquaculture: Status, Scope, and Strategic Interventions*. ICAR-DCFR, Bhimtal.

World Bank. (2019). *Fostering Growth of Rural Enterprises in India*. World Bank Group Report No. 14217-IN.

ICAR. (2020). Rainbow trout culture demonstrated in Sarmoli, Munsyari, Uttarakhand. Indian Council of Agricultural Research. https://icar.org.in/node/10266.

ixamBee. (2023). General awareness – static GA: Fish production in Uttarakhand. https://www.ixambee.com/questions/general-awareness/static-ga/345374.

UCOST. (2023). Fish farming using natural water resources in Pithoragarh district. Uttarakhand Council for Science & Technology. https://ucost.in/update/rnd/fish-farming.html.

UKCDP. (2023). Fisheries development in Uttarakhand. Uttarakhand Cooperative Development Project. https://ukcdp.com/fisheries.

Cooperative.uk.gov.in. (2023). Activities of Trout Farming Vipadan Evam Prabandhan Sehkari Mahasangh Ltd. Government of Uttarakhand, Department of Cooperation. https://cooperative.uk.gov.in.