Harnessing Unity : The Power of Clusters in Fisheries Management

Introduction

The cluster-based approach (CBA) is a strategic framework designed to foster sustainable development, boost productivity, and enhance competitiveness in targeted industries or sectors. When applied to the fisheries sector, this approach involves the formation of geographic clusters that bring together different stakeholders such as fisherfolk, processors, traders, researchers, and policymakers. The main objective is to encourage collaboration, resource sharing, and collective action among these stakeholders. By promoting collaboration, the CBA seeks to improve productivity, competitiveness, and the overall socio-economic well-being of fisheries communities.

Background

Fisheries is essential for ensuring global food security, supporting livelihoods, and driving economic growth. Despite its importance, the sector encounters various obstacles such as dwindling resources, environmental harm, market instability, and inadequate technology and infrastructure. Conventional fisheries management strategies have frequently fallen short in tackling these multifaceted issues. As a result, there is a rising acknowledgment of the necessity for participatory, community-driven approaches that empower local stakeholders and foster sustainable progress.

Cluster - Based Approach

The strategy involves the formation of clusters or groups consisting of small-scale fishers and farmers. These clusters are created based on specific criteria such as proximity, fishing practices, or available resources. By bringing farmers together, CBA promotes the exchange of knowledge and encourages collaboration.

Each cluster focuses on a particular subdomain within the fisheries sector, such as aquaculture, capture fisheries, or post-harvest processing. Alternatively, they may share common resources like water supply channels, infrastructure, and knowledge. This approach allows for targeted interventions to address challenges within each subdomain.

The sharing of common resources among clusters leads to efficient utilization of these resources, resulting in improved productivity. Additionally, collective bargaining within the clusters enhances market linkages and enables better negotiation of prices. As a result, clusters facilitate improved access to markets and value chains.

Strategies for Implementation

A fisheries cluster refers to a concentrated group of interconnected businesses, suppliers, service providers, and supporting institutions within the fisheries value chain, located in a specific geographic area. The process of establishing fisheries clusters typically involves several important steps:

1. Cluster Identification :

This step entails conducting a comprehensive assessment of fisheries resources, infrastru cture, market opportunities, and socio-economic conditions. The purpose is to identify regions that have the potential to become clusters.

2. Stakeholder Consultations : In this stage, engagement with various stakeholders is crucial. This includes local communities, fisherfolk, government agencies, research institutions, NGOs, and private sector actors. The aim is to gather support and build consensus for cluster formation. Additionally, mapping exercises are conducted to pinpoint geographic areas with significant fisheries activity and potential for cluster development.

3. Formation of Cluster Committees : Establishing formal or informal structures for cluster governance, which may include steering committees, working groups, and collaborative platforms to aid in coordination and decision-making processes.
4. Infrastructure Development : Investing in infrastructure development such as landing sites, cold storage facilities, processing units, and market centers to bolster cluster activities and enhance value addition.
5. Capacity Building : Enhancing the capacity of cluster members through training, technical assistance, and knowledge - sharing initiatives in various areas like sustainable fishing practices, fisheries management, post-harvest handling, value addition, quality control, market access, and entrepreneurship.
6. Market Linkages : Facilitating market linkages by forming partnerships with buyers, exporters, retailers, and e-commerce platforms to ensure market access and fair prices for cluster members.
7. Policy Support : Advocating for supportive policies and regulations that promote sustainable fisheries management, value addition, and market access for enterprises within the cluster.
8. Resource Mobilization: Mobilizing financial, technical, and human resources from government agencies, development partners, and private sector stakeholders to support cluster activities and initiatives.

Activities can be approached as a cluster

1) Hatchery development & Management- Stocking of fingerlings- Rearing- Seed transportation & available to local fish farmer.
2) Bio Floc- Storage System (Cold Storage)- Processing unit Retails Markets
3) Construction of Raceways- Refrigerated/Insulated vehicles Retails Markets
4) Cage culture (Reservoirs & Marine)- Live Vending Centres.
5) Pen Culture- Fish retail markets
6) Cold water fisheries- Fish markets/kiosks
7) RAS Crab system- Value addition products- Branding & Marketing
8) Brackish/Saline water Fisheries- Processing unit- Retail/ Wholesale market
9) Ornamental Fish (breeding & Rearing)- Live feed management- Advertising & Marketing- fish markets/kiosks.
10) Crustacean Farming- feed management- value addition in product- Advertising & Marketing.
11) Bivalve/Pearl Farming- Algae/spirulina farming- mussel processing- Branding & advertising.
12) Seaweed Farming- seaweed value addition- seaweed retail market.
13) Artificial reef culture- Medicinal use- R&D- Reef markets/kiosks.
14) Integrated Aqua Parks- Culinary experience- Processed Aqua products- Retail market- Fish museum- Fishing/ Boating

Development of Fisheries Clusters

Once formed, fisheries clusters undergo a process of development aimed at realizing their full potential and achieving sustainable growth. Key components of cluster development include:

1. Value Chain Integration : Promoting vertical and horizontal linkages along the fisheries value chain, from production and processing to marketing and distribution, to maximize efficiency, value addition, and competitiveness.
2. Innovation and Technology Adoption: Facilitating the adoption of innovative technologies, practices, and management approaches to enhance productivity, resource efficiency, and environmental sustainability within the cluster.
3. Market Access and Branding: Supporting cluster members in accessing domestic and international markets, establishing market linkages, and branding fisheries products to enhance their competitiveness and market visibility.
4. Infrastructure Development: Investing in infrastructure development, such as cold storage facilities, processing plants, transportation networks, and market infrastructure, to improve post-harvest handling, storage, and market access.
5. Socio-Economic Development: Promoting socio-economic development within cluster communities through initiatives such as skill development, income diversification, women's empowerment, and social welfare programs.

Case Studies : International

Norwegian Fishing Cluster : Norway's cluster - based approach in fisheries has led to the establishment of fishing villages and coastal communities that collaborate on resource management, research, innovation, and market development.

Vietnamese Aquaculture Cluster : Vietnam has success fully implemented aquaculture clusters, where fish farmers share infrastructure, technology, and best practices to improve productivity, quality, and market access.

Icelandic Seafood Cluster: Iceland's seafood cluster brings together fisherfolk, processors, and researchers to promote sustainable fishing practices, product innovation, and market expansion, contributing to the country's reputation as a global leader in seafood.

Case Studies : India

Shrimp Farming Clusters in India: Organizing shrimp farmers into clusters has led to better water management, disease control, and market access. Shrimp farming clusters in India are a testament to the country's capability in aquaculture. With continued support from government policies, technological innovation, and sustainable practices, these clusters have the potential further to strengthen India's position in the global shrimp market while contributing to local economies and livelihoods.

1. Andhra Pradesh

Regions: Krishna, East Godavari, West Godavari, and Nellore districts.

Andhra Pradesh is the largest shrimp-producing state in India, contributing a significant portion of the country's shrimp exports. The state benefits from an extensive coastline and favorable climatic conditions. Modern farming techniques, hatcheries, and processing units are well-established here.

2. Tamil Nadu

Regions: Nagapattinam, Thanjavur, and Ramanathapuram districts.

Tamil Nadu's coastal districts have developed robust shrimp farming practices, focusing on both traditional and modern aquaculture methods. The state government supports the sector through various initiatives, including training and financial assistance.

3. Odisha

Regions: Balasore, Bhadrak, and Jagatsinghpur districts.

Odisha has emerged as a significant player in shrimp farming, with a focus on sustainable practices. The Chilika Lake area is particularly notable for shrimp cultivation, leveraging its unique brackish water ecosystem.

4. West Bengal

Regions : South 24 Parganas, Purba Medinipur, and North 24 Parganas districts.

West Bengal has a long history of shrimp farming, especially in the Sundarbans region. The state employs both extensive and intensive farming techniques, and there is a strong emphasis on exporting high-quality shrimp.

5. Gujarat

Regions : Surat, Valsad, and Navsari districts.

Gujarat is rapidly developing its shrimp farming sector, supported by the state's proactive policies and investments in aquaculture infrastructure. The availability of suitable land and water resources facilitates shrimp farming.

6. Kerala

Regions: Alappuzha, Ernakulam, and Kollam districts.

Kerala's backwaters provide an ideal environment for shrimp farming. The state is known for its traditional farming methods, such as pokkali farming, which integrates rice and shrimp cultivation.

Fig.1. Shrimp Cluster activities carried out in various regions of India

Wetland Management Clusters : Community - based organizations managing water bodies collaborate through periodic sharing of lessons and mutual assistance. Wetland management clusters in India are essential for preserving the ecological integrity and biodiversity of these vital ecosystems. Through coordinated efforts involving government agencies, local communities, scientific institutions, and international organizations, India can ensure the sustainable management and conservation of its rich wetland resources.

1. Kolleru Lake, Andhra Pradesh

Type: Freshwater lake.

Kolleru Lake is one of the largest freshwater lakes in India and is a Ramsar site. It serves as a crucial habitat for various bird species, especially migratory birds. Management efforts focus on controlling pollution, preventing illegal encroachments, and maintaining water levels.

2. Chilika Lake, Odisha

Type : Brackish water lagoon.

Chilika Lake is the largest coastal lagoon in India and a UNESCO World Heritage site. It supports a rich biodiversity, including the Irrawaddy dolphin. Conservation efforts include regulating fishing practices, preventing siltation, and restoring natural habitats.

3. Sundarbans, West Bengal

Type: Mangrove forest.

The Sundarbans is the largest mangrove forest in the world and a UNESCO World Heritage site. It is home to the Bengal tiger and diverse aquatic species. Management focuses on protecting the mangrove ecosystem, mitigating human-wildlife conflict, and combating climate change impacts.

4. Vembanad-Kol Wetland, Kerala

Type: Estuarine and freshwater wetland.

This extensive wetland system includes the Vembanad Lake and surrounding areas. It supports agriculture, fisheries, and tourism. Conservation strategies involve controlling pollution, managing water flow, and protecting bird habitats.

5. Loktak Lake, Manipur

Type: Freshwater lake.

Loktak Lake is known for its floating phumdis (heterogeneous masses of vegetation). It is a Ramsar site and supports the Keibul Lamjao National Park, the only floating national park in the world. Management focuses on sustainable fisheries, preventing encroachments, and promoting ecotourism.

6. Harike Wetland, Punjab

Type: Riverine wetland.

Harike Wetland, located at the confluence of the Beas and Sutlej rivers, is a Ramsar site. It provides habitat for numerous bird species and supports local fisheries. Conservation efforts include water management, pollution control, and habitat restoration.

7. Bhoj Wetland, Madhya Pradesh

Type: Urban freshwater wetland.

The Bhoj Wetland consists of two lakes, Upper Lake and Lower Lake, in Bhopal. It is crucial for water supply and biodiversity. Management strategies include maintaining water quality, preventing encroachments, and promoting public awareness.

Advantages of Cluster-Based Approach in Fisheries

The cluster-based approach presents numerous potential advantages for fisheries development, which include:

The cluster-based approach facilitates collaboration and knowledge-sharing among stakeholders, enabling them to address common challenges and leverage collective resources and expertise.

By promoting innovation, technology adoption, and value chain integration, the cluster-based approach enhances the productivity, quality, and competitiveness of fisheries products in both domestic and international markets.

The cluster-based approach fosters sustainable fisheries management practices that promote conservation, biodiversity preservation, and ecosystem resilience.

This ensures the long-term viability of fisheries resources.

The cluster-based approach empowers local communities, fisherfolk, and marginalized groups by providing them with opportunities for participation, decision-making, and socioeconomic development.

By diversifying livelihoods, enhancing adaptive capacity, and strengthening social safety nets, the cluster-based approach builds resilience to external shocks such as climate change, market fluctuations, and natural disasters.

Conclusion

Cluster-based strategies in fisheries have emerged as a valuable tool for advancing sustainable development, boosting competitiveness, and elevating livelihoods within the industry. Through encouraging cooperation, skill enhancement, and market opportunities, fisheries clusters play a vital role in driving socio-economic progress in coastal areas, safeguarding marine ecosystems, and fortifying resilience against environmental adversities.

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