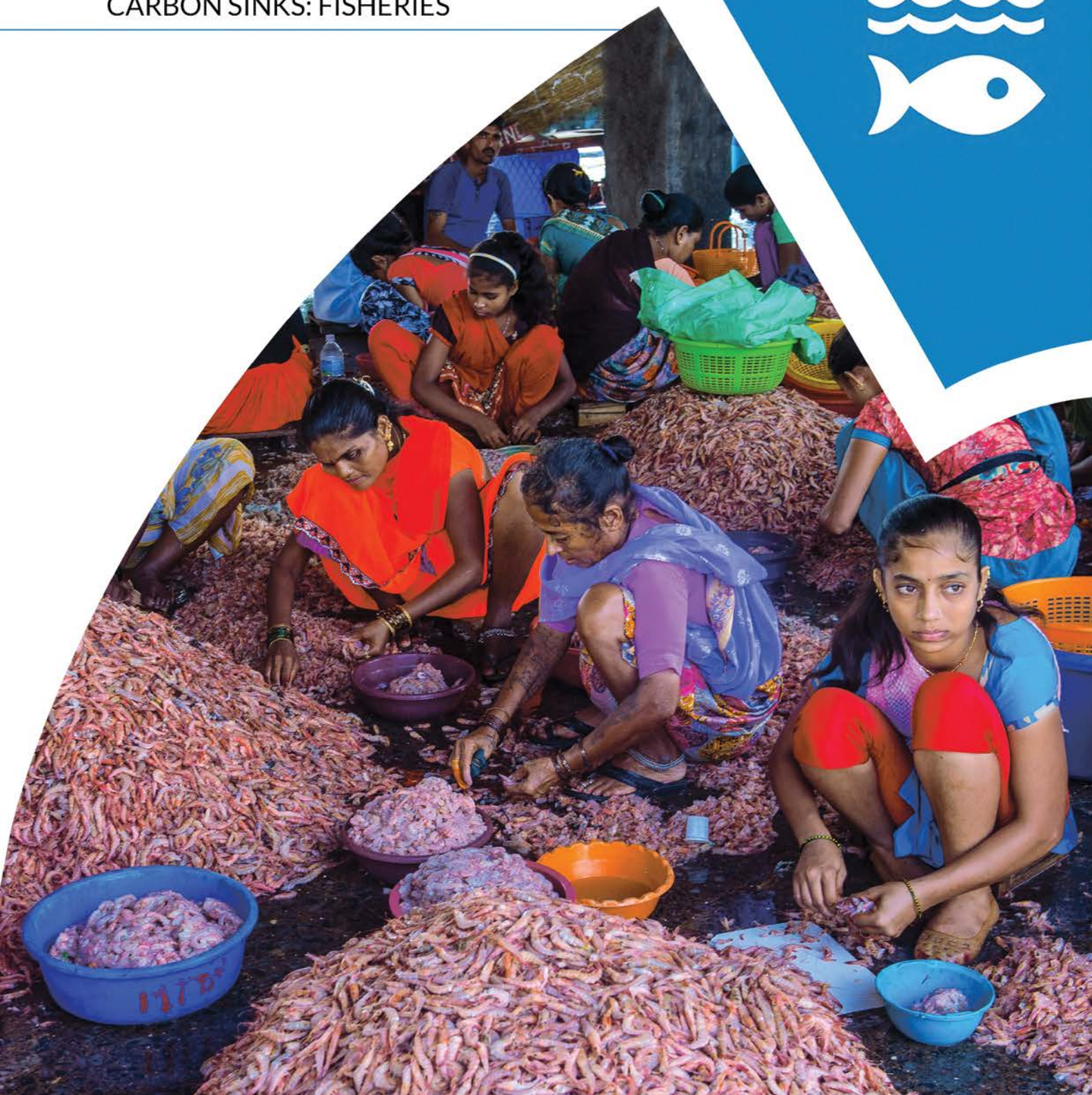
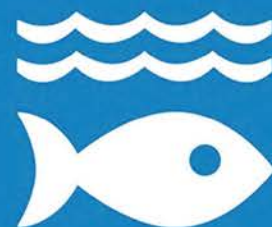


# Scoping Study and Policy Imperatives on Green Jobs and Eco-Entrepreneurship Opportunities for Women in Select States in India.

CARBON SINKS: FISHERIES



Green jobs and Eco-Entrepreneurship has been integral to the discourse on green growth/economy for over a decade and has assumed greater significance of late. This study - Scoping Study and Policy Imperatives on Green Jobs and Eco-entrepreneurship Opportunities for Women in Select States in India was initiated in early 2020 and draws upon the learnings from the United Nations Development Programme (UNDP)'s project "Creating Employment and Entrepreneurship Opportunities for Women in India" (Disha) project. The intent of the study is to identify areas for and promote greater women's workforce participation in renewable energy, green construction, green transport, water management and carbon sinks (forests and marine fisheries). Given the vastness of its scope and geographies, the study was confined to the UNDP's Inclusive Growth project states of Delhi, Haryana, Maharashtra, Karnataka, Telangana, Uttarakhand and Odisha.

The report, prepared by KPMG, is based on secondary sources and stakeholder interactions, as the study was initiated just prior to the COVID-19 pandemic and lockdown, that greatly limited access to primary research, physical consultations and data collections. Even though virtual stakeholder interactions, online consultations and peer review provided information across thematic areas, it is likely that there may be some gaps due to unavailability of gender disaggregated data or restricted information.

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## Scoping Study and Policy Imperatives on Green Jobs and Eco-entrepreneurship Opportunities for Women in Select state in India

CARBON SINKS: FISHERIES

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## List of Abbreviations

<b>ASCI</b>	Agricultural Skill Council of India
<b>CICEF</b>	Central Institute of Coastal Engineering for Fishery
<b>CIFT</b>	Central Institute of Fisheries Technology
<b>CMFRI</b>	Central Marine Fisheries Research Institute
<b>DANIDA</b>	Danish International Development Agency
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>GHG</b>	Green House Gas
<b>GDP</b>	Gross Domestic Product
<b>ICAR</b>	Indian Council of Agricultural Research
<b>ILO</b>	International Labour Organization
<b>km</b>	Kilometre
<b>KSWDC</b>	Karnataka State Women's Development Corporation
<b>MMT</b>	Million Metric Tonne
<b>NABARD</b>	National Bank for Agriculture and Rural Development
<b>NBCFDC</b>	National Backward Class Finance & Development Corporation
<b>NCDC</b>	National Cooperatives Development Corporation
<b>NETFISH</b>	Network for Fish Quality Management and Sustainable Fishing
<b>NFDB</b>	National Fisheries Development Board
<b>QP</b>	Qualification Pack
<b>R&amp;D</b>	Research and Development
<b>SHG</b>	Self Help Group
<b>sq</b>	Square
<b>UN</b>	United Nations
<b>UNEP</b>	United Nations Environment Programme



# Foreword

Climate change is perhaps the biggest challenge of our times and it is forcing all of us to define the kind of economy that works for everyone. The effects of climate change will undoubtedly alter the structure of employment; new jobs and new job families will emerge, others will evolve or become unsustainable. Economies must find ways to reorganize work and production differently.

According to ILO, at least half of the global workforce, around 1.5 billion people will be affected by the transition to a greener economy. The challenge lying ahead of us is the urgent need to equip the people with the right skills that will help them adapt to this transition. Skills gaps have already started emerging across a number of sectors, such as renewable energy, energy and resource efficiency, renovation of buildings, construction, environmental services and manufacturing.

Moreover, the exclusion of women and their needs in decision-making process for mitigation or adaptation measures can pose challenge to achieving gender equality at work. This will have a deep impact on the larger economies. Given that women make up a little over half of the world's population (WEF 2013), their untapped talent could significantly alter our economic development (UNDP 2013).

Nearly 60 percent of India's population is directly dependent on climate-sensitive sectors such as agriculture, fisheries and forestry for its livelihoods, and 80 percent of economically active women are in the agriculture sector. Hence the climate crisis severely affects the women who are dependent on these climate-sensitive livelihoods and who do not have any alternative livelihoods.

Keeping in mind these multiple challenges and based on our learnings from Disha Project that UNDP implemented in partnership with IKEA Foundation, to create employment and entrepreneurship opportunities for women, a study was commissioned to assess the green jobs and eco-entrepreneurship opportunities for women in India. The study focused on five major sectors identified by the Skill Council for Green Jobs: renewable energy, green transport, green construction, forestry, fisheries and water management. It covered Delhi NCR (National Capital Region), Haryana, Maharashtra, Karnataka and Telangana as well the potential states such as Uttarakhand and Odisha.

Although we faced the challenge of lack of gender-disaggregated data, and the study being conducted during the COVID-19 pandemic, the sector-specific reports present some promising prospects for a greener skilling and livelihoods ecosystem. The Government of India and some of the state governments are already moving in the right direction. For instance, the International Solar Alliance in the Renewable Energy space has already gained momentum and the cost of the solar panels in India has reduced in the recent years.

While substantial work has been done to build capacities of people and communities on water management, forest or fisheries, to promote climate-resilient practices, women are often left out and mostly under-represented in such initiatives. As we recover from the pandemic, we must ensure that women are given equal opportunities to be part of our green recovery. Only when we tap into their talents and the huge demographic dividend that is often left out, can we achieve our Sustainable Development Goals at the end of this decade.

UNDP has been working closely with the Government of India and other key partners for an inclusive and climate-sensitive response to COVID-19 that paves the path to greener pathways for recovery. India, as an emerging economy, holds immense potential, given its demographic dividend. But it can never recover fully, or reach its full potential, if half of the population – the women- are not part of its green recovery.



Shoko Noda  
Resident Representative





# Acknowledgement from Lead Facilitator

UNDP India has undertaken a study on the “Scoping Study and Policy Imperatives on Green Jobs and Eco-Entrepreneurship Opportunities for Women in Select States in India”. The report takes into cognizance the climate crises and its implications on lives and livelihoods of the people, and provide some pathways in terms of nature-based livelihoods, that can often be turned into opportunities for more decent work. Be it renewable energy, green transport, green construction water management, forest or fisheries, strides are being made by the Governments at national and state levels to build the capacity of the people and promote climate-resilient practices. And it is but appropriate to bring in the women to partake in the development and be part of the dynamic workforce in the country. And this forms the basis of the study.

This report has been made possible with contributions from many individuals and experts, who took out time and helped put this study together. This report was initiated just prior to the onset of pandemic and was drafted virtually through the lockdown period. A number of virtual consultations with thematic and regional experts were held between April and November 2020, and inputs received on each of the chapters drafted.

In this endeavour, we owe our deepest gratitude to Dr. Sunita Sanghi (Additional Secretary and Senior Advisor, Ministry of Skill Development and Entrepreneurship, Government of India), Dr. Praveen Dhamija (Advisor, Sector Skill Council on Green Jobs), Vandana Bhatnagar (Chief Programme Officer, NSDC), Sudipta Bhadra (Senior Programme Officer, ILO), and Anubha Prasad (National Coordinator, PAGE) for their guidance while discussing our findings, assessing the quality of analysis, the reliability of data, and the soundness of the recommendations emerging from the study.

The support provided by our collaborators in the formulation of background papers needs a special mention. We express our utmost appreciation for the hard work put in by the KPMG team lead by Manpreet Singh and Vivek Panda.

We would like to thank and acknowledge the inputs received during the peer review of the draft chapters by Dr. Srinivas Shroff Nagesha Rao (CEO, REC Foundation), Hitesh Vaidya (Director, NIUA), Suneel Padale (Director Programs, CARE India), Vishaish Uppal (Livelihoods Specialist, WWF India), Moho Chaturvedi (Independent Consultant) and Ramya Rajagopalan (Independent Researcher).

Our gratitude to UNDP colleagues for their insightful comments during the peer review process. Our heartfelt appreciation for the overall insight and guidance by Harsh Singh, Amit Kumar, Alka Narang, and the contributions by UNDP India team, especially Sushil Choudhury, Saba Kalam, Dilip Singh, Abha Mishra, Rashmi Bajaj, Manisha Choudhury and colleagues from the Inclusive Growth team.

We are eternally grateful to Ms. Shoko Noda, Resident Representative, UNDP India and Ms. Nadia Rasheed, Deputy Resident Representative, UNDP India for their inspiration, encouragement and guidance throughout the process. None would have materialised without the faith that they reposed in our endeavours.

We thank all the experts and colleagues for their support and contribution.



Swayamprabha Das  
Inclusive Growth



## Executive Summary

**W**ith the global population projected to rise to 9 billion by 2050, the need for ensuring food security will take centre-stage in the course of meeting global nutritional requirements. Nearly 16 percent of animal protein consumed globally comprises fish. In addition to food security, almost 820 million people around the world depend on fisheries and aquaculture for their livelihoods. In India, fisheries constitute close to 1.1 percent of India's Gross Domestic Product (GDP). The rise in production domestically has been accompanied with increased workforce engagement, with over 14 million people employed in the sector.

Women play a substantial role in the sector, constituting around half of the workforce in fisheries and aquaculture globally. While the participation of women in the sector has been increasing consistently, their engagement is restricted in nature. Despite their remarkable contributions to the growth of the sector, persistent gender inequalities prevent them from fully participating in economic opportunities and have limited their role in the decision making process. Further, their scale of operation is restricted by dampened risk-bearing abilities owing to lack of access to resources, limited control over assets, lower rates of entrepreneurship, and time and labour burden. In addition to these factors, the sector faces overwhelming challenges including over-exploited resources, lack of skilled workforce and infrastructural issues.

Evidence suggests that mainstreaming gender, and thus gender equity, in the workforce is crucial to achieving the Sustainable Development Goals on poverty reduction, and food and nutrition security. This makes a compelling case for mobilisation of public and private support to the sector at national, state and local levels. While several policy and regulatory measures have been put in place, improved access to finance, robust pricing mechanisms and development of entrepreneurial skills among the woman workforce require urgent attention. Further, as the sector grows, a strong policy framework needs to be developed for 'greening' existing jobs, increasing women's participation in current and potential green job roles and ensuring sustainable development of the sector.

With the outbreak of COVID-19, the challenges for the fisher folk population have increased manifold due to loss of fishing seasons and major disruptions in the supply chain. In addition to reduced output and productivity, the staggered effects of the pandemic have brought survival itself under question for fishing communities solely dependent on the sector. As the government attempts to cope with the situation, an enhanced fiscal stimulus through subsidies to fisheries, incentives to small-scale fish farmers, collateral-free loans and improved income security for women fisher folk are some of the measures that may be undertaken for faster recovery and "green growth" of the sector.

*Disclaimer: All the estimations that have been made in this report are suitable for a pre-COVID scenario.*



1.

# Overview

A blue-tinted photograph of a busy market scene. In the foreground, a woman in a dark top and patterned sari carries a large basket filled with white fabric on her head. To her right, another woman in a light-colored sari is smiling and looking towards the camera. The background is filled with other people, some also carrying baskets, and market stalls. The overall atmosphere is one of a bustling, traditional marketplace.

## 1.1 SETTING THE CONTEXT

The fast-growing fisheries sector contributes significantly to the national economy and provides livelihoods to a large section of society. However, over-exploitation and severe environmental degradation of existing fish resources necessitate an innovative alternative to conserve the aquatic ecosystem and boost the economy.

Sustainable management of fisheries is vital for increasing economic growth, alleviating poverty and enhancing nutritional security for millions of fish-dependent households; enabling women to completely engross in this practice can be beneficial.

Enhancing the role of women in the sector faces multiple barriers including infrastructural challenges as well as lack of a robust policy framework and skills across the entire ecosystem, hindering the growth of the sector. This report thus presents a sectoral analysis of the fisheries sector in India, outlines policies in place pertinent to green jobs and eco-entrepreneurship opportunities for women in selected states.

## BACKGROUND OF THE STUDY

This scoping study on Green Jobs and Eco-entrepreneurship opportunities for women in select states, draws its strength and learning from the UNDP-IKEA Foundation project 'Creating Employment and Entrepreneurship Opportunities for Women in India (Disha)'. This project focused on enhancing opportunities for marginalized women in jobs and entrepreneurship and enabled development of models and curriculum like the Biz Sakhi and Women Sourcing Managers. Though some of the pilots under Disha did include components of green initiatives, but a full pledged pilot/programme could not be developed majorly because of lack of information and the potential for growth. But as the conversations around jobs/entrepreneurship - climate change nexus gathered attention, a need was felt to design a study to fill this

gap in data/information and develop sector specific pathways with a focus on marginalised women.

While the discourse on Green Economy/Green Growth is huge and covers a range of sectors, the study focuses on addressing the following two-fold objectives:

- Gap assessment of existing and potential green jobs and mapping the availability of skilled workforce for the identified job roles in the RE sector; and
- Development of an implementation roadmap and provision of recommendations to enable women to leverage the existing and potential opportunities.

Given the limitation and the acceptance that many of the Green Jobs sector is still evolving and maybe in nascent stage, the geographic scope of the study was limited to the states of Delhi NCR, Haryana, Maharashtra, Karnataka, Telangana,; Uttarakhand and Odisha.

## APPROACH AND METHODOLOGY

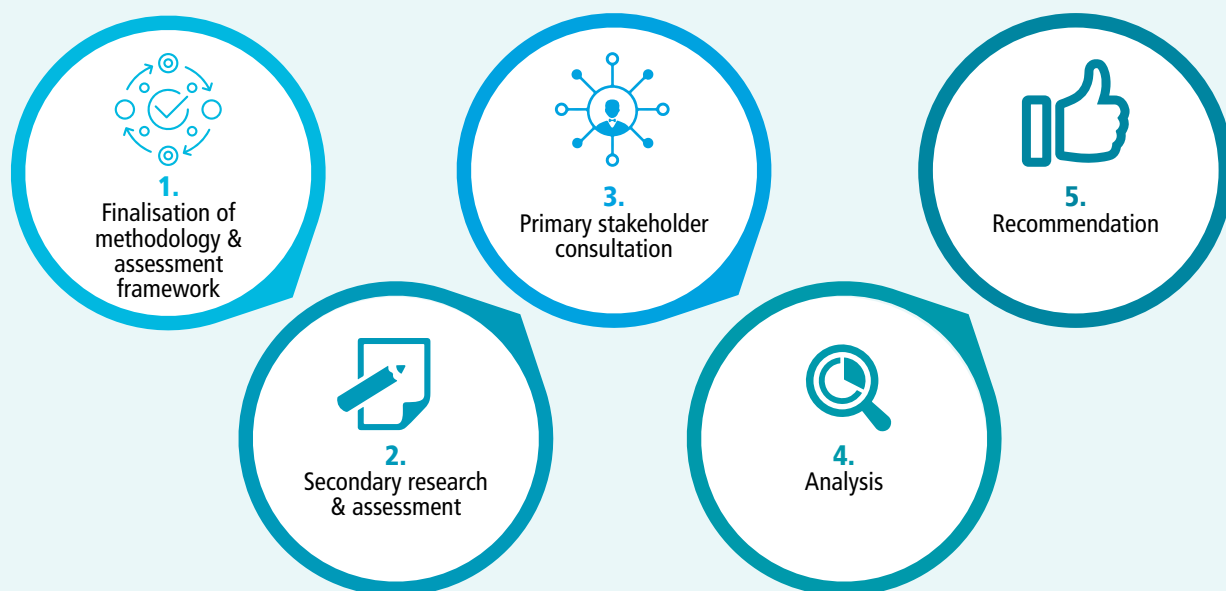
The scope of the study includes the following five phases: finalisation of methodology and assessment framework, secondary research and assessment, primary stakeholder consultation, analysis and report writing. In each phase, various tasks as suggested in the scope were performed to ensure completion.

### SCOPE OF THE STUDY

The study mainly focuses on **marine fisheries and aquaculture**. According to the Handbook on Fisheries Statistics 2018, Ministry of Fisheries, Animal Husbandry and Dairying Department of Fisheries, Government of India, the average annual growth rate in marine fisheries was 1.73 percent in 2017-18 and inland fisheries grew by 14.05 percent. While the entire Indian fisheries industry continues to grow, we can anticipate an increased participation of women in marine fisheries in India.



**Figure 1:** Approach and methodology



## LIMITATIONS OF THE STUDY

The uniqueness of this assignment is an opportunity to explore and find a way forward, but it also presents its own set of challenges, particularly in terms of paucity of data. The analysis conducted in the study is hindered by the following limitations:

- Lack of sector specific data on women currently engaged in unskilled and semi-skilled job roles in the select states, making it a challenge to estimate of the growth forecast for semi-skilled and unskilled job roles in the sector;
- Lack of information on green jobs in the fisheries sector, i.e., there is no information on job roles that can be categorised as a “green job”;
- Data on the fisher population, fishing craft and fishing gear are available from both the state governments and the livestock census, while data on workers engaged in fishing are also available from the population census. However, the data from these sources are not comparable due to differences in concepts and definitions and their application across states;

- Information about training institutes offering training specifically to women is limited; and
- Due to lack of data on the sector, the focus is on case studies for potential job roles and identifying entrepreneurship opportunities that can be replicated across the sector

## 1.2 INTRODUCTION TO THE SECTOR

In 2016, global fish production reached about 171 million tonnes, the share of aquaculture being around 47 percent of the total, whereas the total capture fisheries production peaked at about 90.9 million tonnes.<sup>1</sup> Approximately, 820 million people are dependent on the sector for their living. These include both highly organized as well as small scale and informal livelihoods comprising a host of pre- and post-harvest activities in the fisheries sector. As the sector gains traction globally, it is projected to register positive growth over the next couple of years. The 2030 Agenda for Sustainable Development envisages sustainable development of fisheries and aquaculture to improve food security and nutrition, worldwide.<sup>2</sup>

<sup>1</sup> FAO, 2018. The State of World Fisheries & Aquaculture.  
<sup>2</sup> Ibid.

In India, fisheries have nearly 1.1 percent of contribution to the country's GDP. Over the years, the sector has witnessed sustained growth chiefly driven by increased activities in the production segment. In 2018-19, the total fish production stood at 13.42 million metric tonnes (MMT) up from 12.6 MMT in 2017-18.<sup>3</sup> Of the total production in 2018-19, inland fisheries, the largest contributor, had a share of nearly 9.71 MMT while marine fisheries contributed 3.71 MMT.<sup>4</sup>

The growth in the production segment has been accompanied with the rising employment potential of the sector. Presently, the sector employs nearly 14 million people. Women form a significant proportion of the workforce engaged in the sector. With 20 percent of the fresh fish catch being processed through methods like drying and salting, fish processing is a key source of income for fisherwomen in maritime states of India. Additionally, around 65 percent of the fresh fish produced in India is marketed by women.

## DEFINING GREEN JOBS

International Labour Organization (ILO) defines green jobs as, "Green jobs are decent jobs that contribute to preserve or restore the environment, be they in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency."

According to ILO, decent work involves "opportunities for work that is productive and delivers a fair income, security in the workplace and social protection for families, better prospects for personal development and social integration, freedom for people to express their concerns, organize and participate in the decisions that affect their lives and equality of opportunity and treatment for all women and men".<sup>5</sup>

United Nations Environment Programme (UNEP) defines green jobs as "work in agricultural, manufacturing, research and development (R&D), administrative, and service activities that contribute substantially to preserving or restoring environmental quality. Specifically, but not exclusively, this includes jobs that help to protect ecosystems and biodiversity; reduce energy, materials, and water consumption through high

efficiency strategies; de-carbonise the economy; and minimize or altogether avoid generation of all forms of waste and pollution".<sup>6</sup>

For the purpose of this study:

'Green' implies:

- Limiting or preventing negative environmental impacts, such as pollution, of ecosystem components such as air, water and soil;
- Being climate friendly via minimization of resource wastage;
- Maximizing resource efficiency; and
- Focusing on resource conservation.

'Green jobs' include social considerations such as improvement of working conditions, promotion of health and well-being, better livelihood generation, community development, etc. Green jobs can be existing or may require, reskilling, upskilling or developing new skills.

## DEFINING ECO-ENTREPRENEURSHIP

Entrepreneurship is an area that is linked to the economic development of any economy by accelerating its growth and prosperity. The last few decades have witnessed the emergence of women as entrepreneurs both in the developed and developing economies. It is evident that women entrepreneurs have greatly contributed to improved poverty levels and creation of various employment opportunities.<sup>7</sup> These principles of entrepreneurship can also be applied to create sustainable business models while tackling environmental issues at macro levels. This is known as eco-entrepreneurship, wherein businesses operate sustainably contributing to economic development and improved environmental quality.

## DEFINING GREEN JOBS FOR FISHERIES

Given the scope of the fisheries sector, while there are no specific job roles that can be defined as "green", there are sustainable activities that can be introduced to make the job roles green. These job roles comprise components such as sustainable fishing practices, environment-friendly processing and packaging, etc. It entails five broad elements listed in Figure 2.

<sup>3</sup> Government of India, Ministry of Fisheries, Animal Husbandry and Dairying Department of Fisheries, 2018. *Handbook on Fisheries Statistics*.

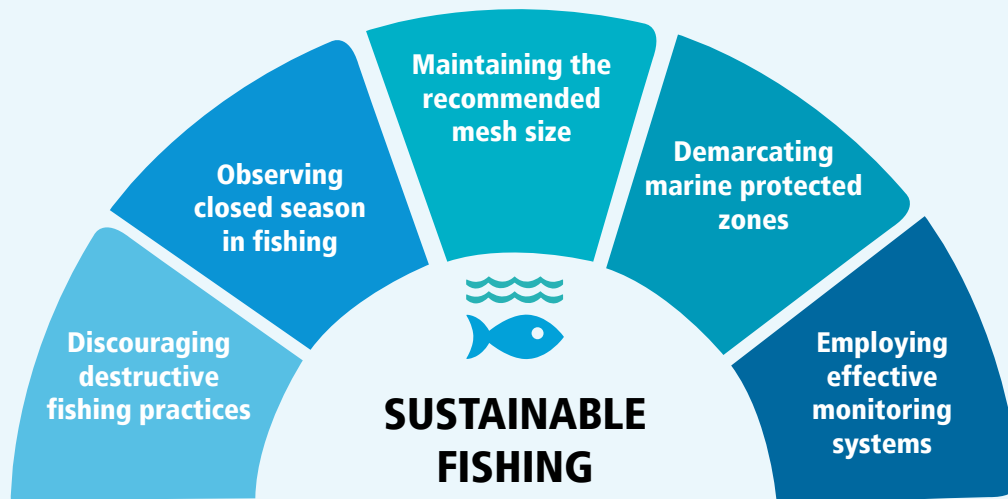
<sup>4</sup> National Fisheries Policy, 2020.

<sup>5</sup> <https://www.ilo.org/global/topics/decent-work/lang-en/index.htm>

<sup>6</sup> <http://www.fao.org/rural-employment/work-areas/green-jobs/en/>

<sup>7</sup> Tiwari, Neha, 2017. *Women Entrepreneurship in India: A Literature Review*.

**Figure 2:** Elements of sustainable fishing



While fishing as an economic activity is not green, there is scope for introducing sustainable measures in the activities that are carried out in this sector.<sup>8</sup> The rising environmental concerns associated with the sector call for development and adoption of sustainable strategies such as genetic selection, biosecurity and disease control, and digital innovation, with business developments in investment and trade.<sup>9</sup>

Other measures such as maintaining the recommended mesh size prevent capturing of juvenile fishes, increase long-term sustainable yield and ensure that sufficient fish survive to maturity,<sup>10</sup> thus serving as a sustainable option for fishing. Not discouraging destructive fishing practices may result in irreversible damage to aquatic habitats and ecosystems. Hence it is imperative to discourage these practices, leading to preservation of the aquatic ecosystem.

According to estimates from Food and Agriculture Organization (FAO) of the United Nations (UN), the Green House Gas (GHG) emissions from agriculture, forestry and fisheries are projected to increase by 30 percent by the year 2050. This necessitates a transition towards more sustainable practices in the sector, which will lead to the creation of about 200 million decent green jobs by 2050 along the entire food production system.<sup>11</sup>

## Overview of the Fisheries Sector

India being the third largest fish producing nation in the world and second largest aquaculture fish producer contributes around 7 percent to the total global fish production. In India, there are four main types of fisheries, namely, freshwater, brackish water, marine and shellfish.

- **Freshwater fisheries:** 70 percent of the country's fish production comes from freshwaters (or inland waters), of which 65 percent comes from aquaculture.
- **Brackish water fisheries:** brackish water resources in India comprise estuaries (deltaic river mouths), coastal lagoons, lakes, backwaters, tidal creeks, canals, mudflats, mangrove plants, etc. These water bodies have certain characteristics such as fluctuating water level synchronizing with the tides, wide salinity range, higher nutrient content and productivity, and so on.
- **Marine fisheries:** Marine fisheries deal with fishery aspects of the sea water or ocean, playing a crucial role in the Indian fisheries sector. These can be further grouped as surface-water fish (pelagic), mid-water fish (pelagic) and bottom-water fish (demersal).
- **Shellfish fisheries:** Shellfish are aquatic invertebrates having an exoskeleton and can be

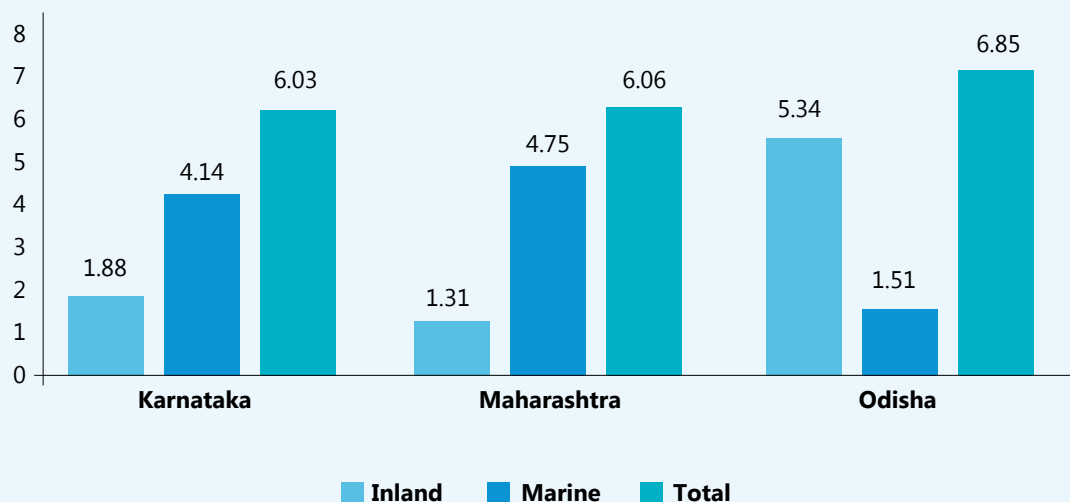
<sup>8</sup> <https://greentumble.com/sustainable-fishing-practices/>

<sup>9</sup> FAO, 2020. *The State of World Fisheries & Aquaculture Sustainability in Action*.

<sup>10</sup> <http://www.fao.org/3/AC749E07.htm>

<sup>11</sup> <http://www.fao.org/rural-employment/work-areas/green-jobs/en/>

**Figure 4: Inland and marine fish production in 2017-18 (in lakh tonnes)**



grouped as crustaceans and molluscs. The former refers to organisms having segmented bodies protected by armour-like sections of thick or thin shell and bear jointed appendages while the latter one can be further classified into three categories: bivalves, univalves and cephalopods.<sup>12</sup>

To support sector growth within the country, the Government of India has provisions to offer direct and indirect subsidies. Direct subsidies are associated with purchase of vessels, gears and engines, fuel subsidy and assistance for aquaculture activities. Indirect subsidies include fiscal support for various welfare schemes, construction of ports, fishing harbours and fish landing centres and development of post-harvest and market infrastructure. Some direct and indirect subsidies are:

- Subsidies or grants for buying or modernizing boats, engines, fishing gear and other fishing equipment (iceboxes, GPS, communication systems, fish finders) in artisanal and mechanized sectors;
- Subsidies for land, capital costs and working capital assistance in aquaculture for small-scale and large-scale operatives;
- Grants for safety equipment; disaster preparedness and mitigation infrastructure and equipment;

- Tax exemption on kerosene for motorized boats (in Kerala); and
- Reduced cess on seafood exports, etc.<sup>13</sup>

Another way to enhance sectoral growth, role of women in it and maximize long-term community benefits is through formation of cooperatives. These cooperatives may help in improving the status of fisherwomen, eradicate poverty and contribute to responsible fisheries as well as food security.<sup>14</sup> Both marine and inland sectors have large numbers of fisheries cooperatives, with Maharashtra having the maximum number of these organizations. However, the involvement of women in these cooperatives is very limited.<sup>15</sup>

### **Green Jobs for Women in the Fisheries Sector**

The creation of green jobs for women in marine fisheries requires operationalizing of sustainable measures across the value chain including sustainable fishing practices, mainstreaming gender in sector employment, sustainable processing and environment-friendly packaging.

<sup>12</sup> <http://nfdb.gov.in/PDF/Fish%20&%20Fisheries%20of%20India/1.Fish%20and%20Fisheries%20of%20India.pdf>

<sup>13</sup> [http://eprints.cmfri.org.in/9080/1/17.Aswathy\\_and\\_Shyam\\_Subsidies\\_in\\_Indian\\_fisheries.pdf](http://eprints.cmfri.org.in/9080/1/17.Aswathy_and_Shyam_Subsidies_in_Indian_fisheries.pdf)

<sup>14</sup> <http://www.fao.org/3/ap408e/ap408e.pdf>

<sup>15</sup> Pandey, S. et al, 2012. Performance of fisheries cooperatives in India- an evaluation of primary societies in Thane District of Maharashtra.

Rural women in coastal areas of India are actively engaged in fishing and post harvesting activities. Additionally, many employed in seafood processing facilities, are members of fishers' organizations and do fishing as a family tradition to financially support their households.

In a census conducted by the Central Marine Fisheries Research Institute (CMFRI), in 2010, it was found that around 32 percent of women were engaged in different activities across the value chain of the sector.<sup>16</sup> The sector has grown significantly since then, and the women's participation rate is further projected to increase in the future.

From the sustainability, livelihoods, resource use, and nutritional security aspects, women in fisheries occupy an important role at the national and regional levels. Some job roles in which women's participation already exists include:

- Small-scale fisher;
- Wholesaler;
- Retailer;
- Fish vendor;
- Labour engaged in post-harvesting activities such as cleaning, gutting, washing, sorting, grading;
- Labour engaged in packaging, labelling and storage;
- Quality control personnel; and
- Net-makers and menders.

Assessment of the sector, however, reveals significant gaps with respect to job roles where women's participation presently exists. Women play a major role in small-scale fisheries and contribute increasingly in capture fishing and other activities. They are mostly engaged in inland fishing and aquaculture activities in many countries and are involved in feeding, harvesting and processing fish and shellfish. They can also take up managerial roles in small enterprises such as fishponds. In some countries, they are often occupied in unloading of catch that is taken to beaches or fish smoking huts, and utilization of fish wastes to make suitable products.<sup>17</sup>

Fisherwomen generally do not participate in deep-sea fishing since it entails extreme physical labour and is

also time consuming. Also, women fisher folk generally work only in small-scale fishing since they have domestic responsibilities and familial commitments. Auctioning of fish catch at the landing harbours remains a male-dominated activity. While wholesale and retail activities witness equal participation of women and men, local fish vending is usually carried out by women engaged in the sector. They are primarily engaged in fish drying, fish marketing, net-making and shrimp processing activities.<sup>18</sup> They also work in seafood processing plants and are part of some fisher's organizations.<sup>19</sup>

There are some fisherwomen communities that are involved in seaweed farming activities across various countries. However, it is observed that they do not receive adequate fiscal and policy support and limited funds are allotted to small-scale fisheries. Fisheries and aquaculture statistical systems fail to recognize their involvement in fishery/shellfish harvesting activities. In addition, there are instances of some income-generating activities, initially carried out by women, being eventually taken up by men. For example, in mussel culture development, it was observed that once the activity became lucrative, although traditionally carried out by women, it was taken over by men (Ramachandran 2011).<sup>20</sup>

According to the Handbook on Fisheries Statistics 2018, women constitute approximately 27 percent of the total fisher folk population engaged full-time in fisheries activities. Maharashtra has the highest number of fisherwomen (93,178) engaged in the sector compared to other states such as Karnataka (67,153) and Odisha (40,608).<sup>21</sup>

The involvement of fishing communities of women is critical for sustainable fisheries management. Women, as major participants in small-scale fisheries and aquaculture, have a fundamental role in fisheries development and production, and their inclusion in the decision- and policy-making process is key to developing appropriate strategies for poverty alleviation and food security, particularly in view of changing global conditions (Harper et al, 2013). Measures such as the establishment of beach management units on the coasts of Kenya have been cited as examples of positive government measures in improving community

<sup>16</sup> Marine Fisheries Census, 2010, India.

<sup>17</sup> FAO. *Promoting Gender Equality and Women's Empowerment in Fisheries and Aquaculture*.

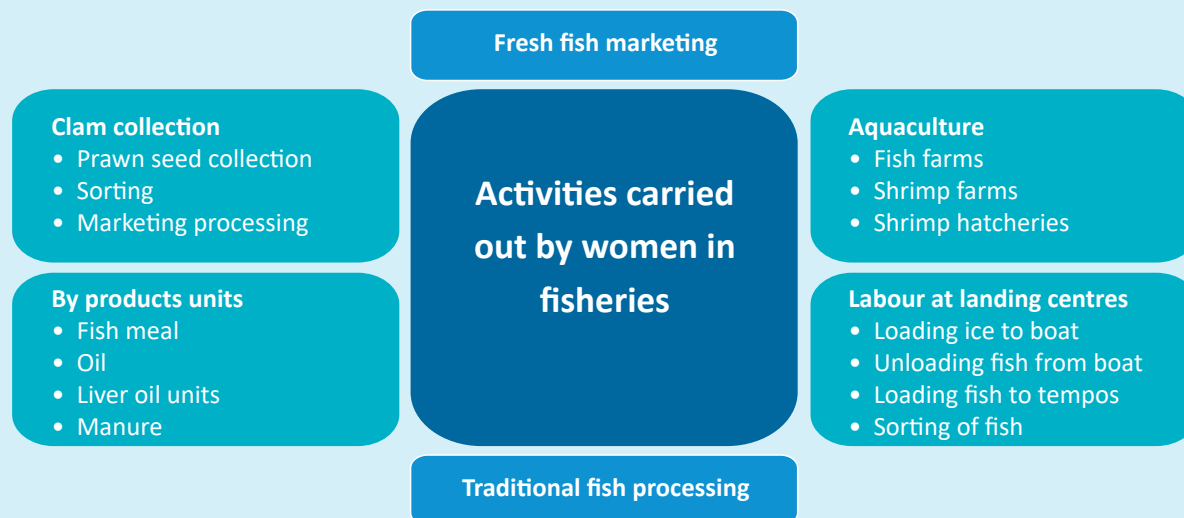
<sup>18</sup> <http://www.fao.org/3/ad745e/ad745e00.pdf>

<sup>19</sup> <https://indianfisheries.icsf.net/en/page/617-Themes.html>

<sup>20</sup> FAO. *Promoting Gender Equality and Women's Empowerment in Fisheries and Aquaculture*.

<sup>21</sup> Government of India, Ministry of Fisheries, Animal Husbandry and Dairying Department of Fisheries, 2018. *Handbook on Fisheries Statistics*.

**Figure 3:** Activities carried out by women in fisheries



participation, including the participation of women, and expanding sustainable fishery practices (CISP, 2018). Further, there are instances of traditional practices supporting women in their fishery roles. For example, in the fishing villages of Navagaon in Maharashtra in India, fish processing activities take place on community land, whose unofficial ownership and management lies with the traditional village-level governance body or panchayat. This land is divided among fishing families and passed down to the daughters-in-law of the house. As it is jointly owned by the community, it cannot be sold or alienated in any manner (Peke, 2016). Such customary practices need to be strengthened through the legal recognition of community property rights.

### **1.3 IMPLICATIONS OF COVID-19 ON THE SECTOR**

The COVID-19 outbreak has greatly affected livelihoods of fishing communities across the country, small-scale fisher communities being the worst affected. Complete lockdown of the harbours and landing centres has hampered their daily incomes. These fisher communities are finding it hard to market their catches. Since the time allotted to sell the catch is limited, they are forced to sell at a low price. It has also impacted the lives of women fish vendors as the fishing activities

are prohibited. Export activities have come to standstill and, because of this, the entire fishing sector, along with its allied sectors like net mending and boat repairing is affected adversely. The value chain in the fishing sector has been totally disrupted. It is hoped that the recovery of the sector will take a while and needs to be supported with relief packages and government schemes like Mahatma Gandhi Rural Employment Guarantee Scheme, etc.

As noted by Ms Swaminathan Research Foundation in its report- "In some villages near Chennai, small scale fishers fishing near shore areas are struggling to market their catch. Due to physical distancing norms, only few fisherwomen are able to buy fish from the fishermen in the landing centres. Since the time allotted to sell the fish is very short, they are forced to sell their catch at a low price. For example, if the fish rate was INR 500 per kilogram before COVID-19 lock down, the rate now is just INR 300 to 350. Women fish vendors are considerably affected due to the lockdown as there is no fishing activity and in some places, only limited boats are fishing. The low catch brought to the landing centre is subjected to high demand. Even when few women purchase affordable amount of fish from the landing centre for street vending, due to the pandemic, people



are not purchasing the fish. Customers are also seen bargaining for lower price. Due to this, their income has totally reduced and they are facing difficulty to manage their families. There is another section of fishers who suffer due to lack of storage facilities in marketing their catch and are severely affected. It may be pointed out that a huge quantity of Tuna fish was discarded last week, in Chennai because of unavailability or lack of storage facilities.<sup>22</sup>

According to FAO, it is not yet clear whether the sector will experience a quick or slow recovery after the pandemic is over. While some seafood companies may manage or even benefit from the crisis, a level of industrial consolidation is to be expected, as well as re-sourcing. Digital innovation, accelerated shifts towards Web-based applications, online services and improved product traceability and sustainability are some of the results likely to emerge from the crisis. At a local level, fishers and fish workers are adapting by changing fishing gears, targeting different species or selling their products to the domestic market. Some fishers, fish farmers and fish workers are selling directly to the consumer. While these innovations will

support communities, especially women operating in the post-harvest sector, domestic markets have limits both in terms of demand and price. In the short term, possible disruptions to economies and livelihoods could come from labour shortages (travel barriers, labour lay-offs, etc.); direct boat-to-consumer sales; aquaculture input shortages (feed, seed, vaccines); as well as fishing (e.g. bait, ice, gear, etc.); competition for sourcing and transport services (something which is already happening in the agricultural sector); and a lack of finance and cash flow (delayed payment of past orders). In addition to a lack of economic opportunities, women fish vendors may be exposed to a greater risk of infection, since markets are a place of close contact and have limited sanitation and hygiene facilities. This is all the more fundamental in view of women's decreased job security, especially those informally employed in the fisheries and aquaculture sectors and migrant workers in seafood processing factories.<sup>23</sup>



<sup>22</sup> COVID-19 impact on livelihoods of marine fishing communities, <https://www.msrff.org/content/COVID19-impact-livelihoods-marine-fishing-communities-0>  
<sup>23</sup> Q&A: COVID-19 pandemic - impact on fisheries and aquaculture, <http://www.fao.org/2019-ncov/q-and-a/impact-on-fisheries-and-aquaculture/en/>



2.

## Sectoral Analysis



Women contribute significantly to the growth of the sector. However, their efforts often go unnoticed. Therefore, it has become the need of the hour to increase their participation through in-depth analysis of the entire ecosystem of the sector and necessary policy regulations.

## ASSESSING EMPLOYMENT OPPORTUNITIES IN THE VALUE CHAIN

Identification of gaps in the fisheries ecosystem is an important aspect to explore the underlying opportunities for women in the sector. This necessitates a thorough evaluation of the entire value chain along with different activities that the ecosystem entails.

### Description of activities in the value chain

#### Capture Fisheries/Harvesting

- This is the very first stage in the value chain that involves gathering and removing fish from the place in which it has grown and refers therefore to fishing and catching wild fish and shellfish. Fish harvesting methods range from artisanal fishing to high-end industrial level fishing that employs fishing gears and huge fishing vessels. Fishing is mainly done by men; the fishermen population is around 65 percent

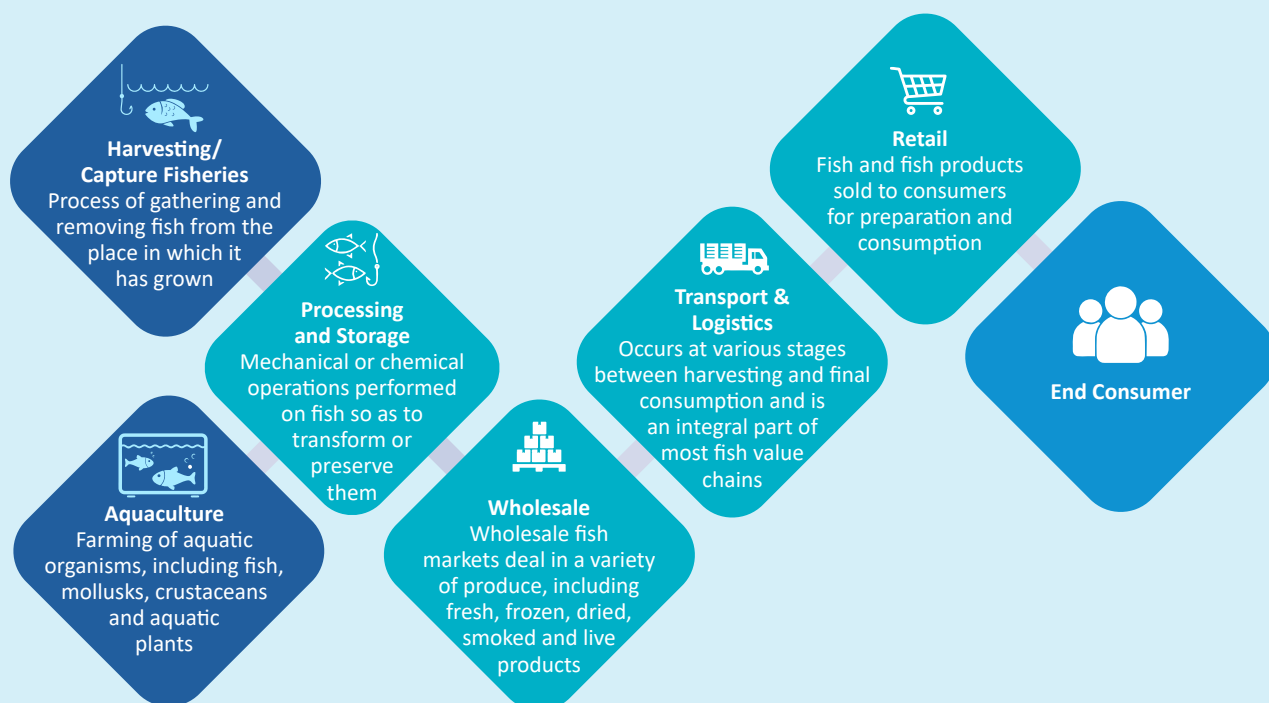
of the total fisher folk population (according to the Handbook on Fisheries Statistics 2018).<sup>24</sup> However, women are also selectively engaged in near-shore, in-shore and small-scale fishing, and are mainly involved in inland fishing and aquaculture activities which is less destructive and more sustainable. They are mostly engaged in skill-intensive and time-consuming coastal activities such as net making, fish marketing and processing, etc. In addition to these tasks, they are also involved in shellfish gathering/clam gleaning.<sup>25</sup>

**Gap:** Fishing gears being less selective in deployment lead to capture, retention, and subsequent discarding of immature fish and unwanted species, thus disturbing the natural ecosystem.

#### Aquaculture

- The process of farming of aquatic animals, including fish, mollusks, crustaceans and aquatic plants is termed as aquaculture. Nearly all the fish produced from this activity is meant for human consumption.
- The aquaculture industry employs both genders, contributing significantly to global fish catches, fulfilling nutritional requirements and generating income to support local and national economies.

Figure 5: Fisheries value chain



<sup>24</sup> Government of India, Ministry of Fisheries, Animal Husbandry and Dairying Department of Fisheries, 2018. *Handbook on Fisheries Statistics*.

<sup>25</sup> FAO *Promoting Gender Equality and Women's Empowerment in Fisheries and Aquaculture*.



**Gap:** Poor harvesting practices and poor handling lead to contamination and physical damage of the produce.

### Processing and Storage

- To preserve the fishes, mechanical or chemical operations are performed which are termed as processing. Fish are processed in a variety of ways and in different working environments and these tasks are mainly performed by women.
- Fish processing activities such as gutting and cleaning are simple techniques that are designed to extend shelf life. Smoking, sun drying and salting are common traditional processing methods associated with small-scale fisheries value chains. These are often practiced using low-cost technology and with minimal services and facilities.
- To meet international standards of hygiene and food safety, sophisticated fish processing takes place in factory environments.

**Gap:** Storing the catch for long periods under inadequate conditions often renders the product unfit for consumption due to microbial contamination and insect infestation.

### Wholesale

- There are two types of wholesale fish markets: secondary and terminal. Secondary wholesale markets tend to be located in districts or regional cities, procuring the majority of their produce from local capture fisheries or aquaculture producers. On the other hand, terminal wholesale markets are situated in major cities where fish and fish products are channelled to consumers, restaurants and hotels through trade between wholesalers and retailers.

- Wholesale markets deal with a variety of fish and fish products, including fresh, frozen, dried, smoked and live products. These activities are mainly performed by fishermen, but the segment is witnessing increased participation from women in recent years. Additionally, retailing and fish vending have emerged as chiefly women-centric activities.

**Gap:** Quality deterioration during chilling and cold storage and physical damage due to poor handling of processed products result in wastage and reduced output.

### Transport

- Transport and logistics are critical across the value chain. A variety of modes of transport such as bicycle, canoe, motorcycle, rail, pick-up truck, boat, lorry, refrigerated truck, air, etc., is used for conveying the products.
- Product type and value, market location, food safety requirements and other standards, prevailing socio-economic conditions and transport infrastructure and services available are some factors that determine the transportation mode that has to be used in a given situation.

**Gap:** Inadequate water quality or oxygen levels during live fish transport continue to remain a challenge.

### Retail

- The process of selling of fish and fish products to consumers for preparation and consumption at home, as well as the final preparation of fish for consumption away from home is referred to as retail.



- Retailers are located in villages, towns as well as in major cities, close to the points of direct consumption<sup>26</sup>.

**Gap:** Poor analysis of demand and supply leads to over purchase and inability to sell products.

## ASSESSING KEY SKILL REQUIREMENTS FOR 'GREEN JOBS'

Basis our understanding of the value chain and the different types of gaps that persist in the value chain, there are certain critical skills and knowledge within the sector that need to be developed as shown in Table 1.

While major skill gaps have been listed in Table 1, a detailed assessment of the value chain reveals a significantly high proportion of job roles that witness engagement of semi-skilled and unskilled workers.

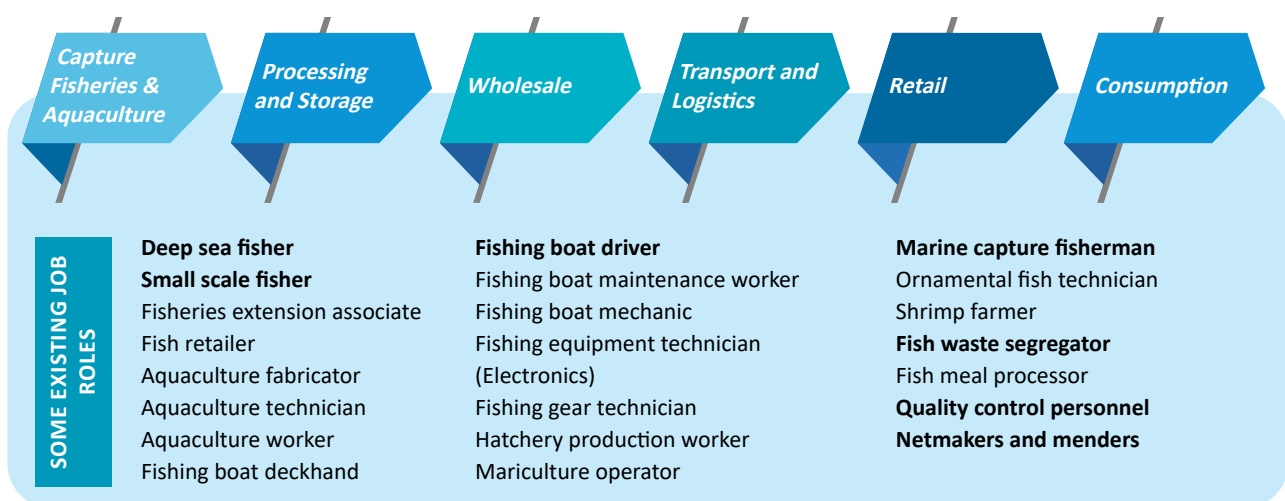
Figure 6 shows a list of existing job roles in the fisheries value chain. Within the harvesting and processing parts, a large proportion of women are engaged in near-shore, in-shore, small-scale fishing and wet fish processing. Women also take up roles of fish vendors, net makers, wholesalers and retailers.

Based on sustainable fishing routines that can be embedded into existing fishing practices as discussed

**Table 1:** Critical skills and knowledge required in fisheries

Critical skills and knowledge required in fisheries	
•	Knowledge of the latest techniques in sustainable fisheries management
•	Extension skills to motivate beneficiaries in sustainable fishing
•	Knowledge of assessing quality of fish
•	Knowledge of preservation and processing
•	Knowledge of rules and powers for quality enforcement
•	Training in low-cost improved methods of sustainable fishing
•	Knowledge of market potential <sup>27</sup>
•	Knowledge of species identification and segregation of different varieties of fish specifically in case of toxic catches
•	Skills required for judgment of quality by vision, touch and smell
•	Skills required for assessing the size of the fish for different grades
•	Leadership skills, interactive skills, negotiation skills, bargaining skills, accounting skills required in case of women

**Figure 6:** Existing job roles in the fisheries value chain



<sup>26</sup> <http://www.fao.org/flw-in-fish-value-chains/en/>

<sup>27</sup> Skill Gaps and Training Needs Analysis of the Department of Fisheries, Tamil Nadu for Sustainable Development and Management of Fisheries, Bay of Bengal Programme.



above, the job roles that have been highlighted in Figure 6 can be considered as green job roles.

### **'Greening' Jobs in the Fisheries Sector (Case Studies: Sustainable Fishing)**

Within the existing jobs mapped in the value chain (Figure 6), there is a huge scope for greening the job roles.

Given below are some examples highlighting green job roles within fisheries sector.

#### **Fishery waste: a rich source of collagenase**

In 2018, the Indian Council of Agricultural Research (ICAR) and Central Institute of Fisheries Technology (CIFT), Cochin, undertook a study to develop ways of utilizing fish waste such as fish bones, head, gut, skin, scales and other discarded matter. Collagen, a structural protein, is found in fish bones, skin and scales and it makes up 7 percent of the body weight of a fish. Collagen is a commercially important and popular product and is used extensively in the food, cosmetics and pharmaceutical industries. CIFT conducted a number of laboratory experiments and studies and concluded that fish waste such as fish bones, head, skin and scales can be processed effectively to derive collagen. This could form the basis for a waste to wealth model.

In the fisheries sector, a potential green job could be a fish waste segregator for the segregation and collection of fish waste such as fish bones, heads, scales and skin, and then selling the waste to end-use industries engaged in collagen production. Women fisher folk engaged in post-harvest and processing activities can also take up the task of fish waste segregation and generate revenue by selling the waste to industries.<sup>28</sup>

#### **Recycled ropes from discarded fishing nets**

There is a certain community in Saurashtra, Gujarat, that is actively engaged in collecting discarded and torn fishing nets from the coastal region. Members of the community often travel to such areas during the offseason in fishing – from May till around the

monsoon. They set up their temporary hearths by erecting makeshift tents. In addition to collecting discarded ropes from the coast, they also procure old nets from the coastal villages at a cost of roughly INR 300-500 per net. This price is however not based on length and weight of the nets; it is based on sensory evaluation. They mostly prefer to collect multifilament or monofilament nylon because this is recyclable. The strong ropes that are mostly used for tying boats are also recycled. Once the nets have been procured, they are cleaned thoroughly and dried. The yarn is then unwound and passed through a manual hand-spinning machine. It is quite similar to the coir yarn that is hand spun. Following this process, various types of ropes of varying diameters are spun and are rolled into bundles and sold.<sup>29</sup>

#### **Sustainable fishing practice in the Philippines**

The Tagbanua community in the Philippines has been engaged in fish practices that are sustainable in nature. Its members hunt for specific species only at different times of the year, determined by natural conditions, facilitating replenishment of fish stocks naturally. They also avoid fishing in protected areas where these practices have been prohibited. The traditional fishers usually use hook and line methods, catching only what is needed. These methods are sustainable as the by-catch is minimal and can be quickly released. These traditional Tagbanua practices were considered to prevent injury and death to local Irrawaddy dolphins that were trapped by using modern fishing gear such as nets and traps.<sup>30</sup>

These examples of embedding sustainable techniques in fisheries management can be replicated in the states covered under our study.

Currently, 50 percent of the workforce engaged in fisheries and aquaculture is women. Despite their major involvement in the sector, women's contribution remains largely unrecognized. Marketing, retailing, fish vending and processing emerge as areas of potential growth in the sector, requiring mainstreaming of gender besides mass-skilling of the existing workforce.

<sup>28</sup> ICAR-Central Institute of Fisheries Technology 2018. Fishtech Reporter.

<sup>29</sup> Ibid.

<sup>30</sup> <https://www.nationalgeographic.org/encyclopedia/sustainable-fishing/>

## **JOB PROJECTIONS IN THE MARINE FISHERIES SECTOR**

Within the fisheries sector, women are already engaged in different parts of the value chain. However, their involvement is chiefly restricted to semi-skilled and unskilled roles. It is observed that women usually take up occupations in this sector from a sustenance perspective and their participation in commercial activities is limited.

The last marine fisheries census in India was conducted in 2010. Since the sector has emerged significantly over the last decade, it is difficult to arrive at reliable estimates based on the census figures. Hence, job projections in this sector are primarily arrived at through stakeholder consultations.

- Through stakeholder interactions, it has been estimated that, in the next few years, there will be an enhanced engagement of women in managerial roles; close to a 7 to 8 percent increase is projected. Further, unskilled roles specifically with respect to small-scale fishing and local fish vending will witness increased participation of women by nearly 9 to 10 percent.
- Additionally, the mass skilling efforts by various state and national bodies are expected to boost women's entrepreneurship opportunities and increase their participation in higher management roles.
- There is a growing trend towards women-owned and -run enterprises within this sector.

Following are some case studies highlighting these trends.

### **Ornamental fish farmer**

Mrs. Latha, leader of a women's Self-Help Group (SHG), has pushed the other women in her group to go beyond their boundaries in a male-centric occupation and adopt ornamental fish culture as a means of livelihood generation in Kancheepuram district, Tamil Nadu. Traditionally, Mrs. Latha, along with her group members, was involved in activities such as catching of snakes and rats but, with urbanization, this was no longer viable.

She, along with her group, has successfully established an ornamental fish culture unit. Six varieties of ornamental fish are being cultured; the breeding time for a crop is 15 days and 200 fish are stocked per tank. The prices ranged from INR 0.7 to 300. The shop has gained popularity among fish traders across Chennai. With growth in activities, the SHG received a bank loan of INR 200,000 from a self-employment scheme making it a successful entrepreneurial venture.<sup>31</sup>

### **Shrimp processing plant technicians**

A marine products company in Mandapam, Tamil Nadu, is managed by two pioneer technicians: Mrs. Lakshmi and Mrs. Rani. With education up to primary school and 10-12 years of experience, they supervise 150 women wage earners at the processing plant. Being experts in processing, packing, maintaining official records of the workers and market techniques, their duties involve collecting raw fish stocks, taking attendance records of the women wage earners, deciding the day's work for the workers and distributing raw materials for processing by the labourers. Despite minimal formal education, their leadership qualities and good management techniques have led to the growth of the company and helped the women workers.<sup>32</sup>

### **Seaweed farming**

To boost seaweed cultivation in the country for the advantage of coastal fisherwomen population, the National Fisheries Development Board (NFDB) in association with CMFRI has initiated large-scale cultivation of *G. edulis* and *Kappaphycus alvarezii* along the Ramanathapuram coast of Tamil Nadu. Approximately, 170 SHGs (510 women), identified by the Department of Fisheries, Government of Tamil Nadu, will carry out cultivation along this coast. Training on *K. alvarezii* rafts culture, explant preparation and tissue induction using explants was imparted by the Council of Scientific and Industrial Research and Central Salt and Marine Chemicals Research Institute Regional Research Centre, Mandapam, as a part of their project called 'Mass seedling production of *K. alvarezii* via tissue culture techniques and supply of tissue cultured seedlings to the farmers of Tamil Nadu coast.' Sterile explants that are being cultured for seedling are used for the micro-propagation of the red algae.<sup>33</sup>

<sup>31</sup> Krishnan, M., 2012. *Successful Women Entrepreneurs in Aquaculture: Case Studies from Tamil Nadu*.

<sup>32</sup> Ibid.

<sup>33</sup> <http://nfdb.gov.in/annual-report>

## Jewellery from oyster shells

It was in 2014 that Tiffany Langlinois started her own business venture in New Orleans. What makes her business the perfect example of a sustainable business model is the fact that she makes costume jewellery from oyster shells. Oyster shells are often discarded and end up as waste build-up. Tiffany's business today has become a source of local pride because, through her innovative business, she has created her own jewellery line from waste matter. Her family is engaged in shrimp and oyster farming and so she procures the waste shells from their shrimp and oyster farms. Tiffany's product line includes contemporary jewellery that appeals to the young people in her town. Products include cocktail rings, chokers, necklaces, crowns and bracelets. Each piece of jewellery is carefully designed and crafted to suit the preferences of her customers. Today, Tiffany's business is flourishing with a very loyal customer base from across the globe.<sup>34</sup>

Case studies like these, especially from the coastal states of India, form compelling evidence to promote entrepreneurial skills among women engaged in this sector.

## CHALLENGES TO THE GROWTH OF JOBS IN THE SECTOR

### a) Challenges identified in the sector

#### a. Inefficient utilization of existing resources

- In India, almost three-fifths of the marine fish stock in Exclusive Economic Zones is under heavy pressure and the remaining two-fifths is significantly exploited. This only leaves enough for resource-specific fishing activities such as fishing of tuna. Sustainable management of the marine ecosystem is thus imperative for the sector and the country.

#### b. Lack of a regulatory framework

- A number of commercially viable activities such as breeding marine ornamental fish, marine cage breeding of fin fish, sea-weed culture, etc., remain largely unexplored due to lack of a robust policy framework.

#### c. Lack of bio-security measures

- Inadequate bio-security measures in the area of

coastal aquaculture hinder sustainable development of marine ecosystems.

#### d. Lack of fiscal support

- Currently, the subsidies available in the sector are primarily for fuel, modern fishing gear, fishing nets, ice plants and marketing infrastructure. In addition, some welfare programmes provide financial support to fisher folk communities during the monsoon season, housing welfare, security and insurance.<sup>35</sup> However, these subsidies and incentives need to be expanded to make fishing a more commercially viable occupation.<sup>36</sup>

#### e. Infrastructural challenges

- Rearing and breeding of local area-specific varieties such as sea bass and crab is yet to receive essential support in terms of technology development via in-depth R&D initiatives.
- Fishermen and marginal farmers mostly resort to informal sources of finance due to the absence of a well-developed system of financing from the organized sector. Flow of credit into the marine fisheries and aquaculture sector is weak.

#### f. Challenges of small-scale fisheries

- Besides lack of fiscal support to small-scale fisheries, limited flow of funds is observed in the sector. According to Voluntary Guidelines for Securing Sustainable Small-scale Fisheries in the Context of Food Security and Poverty Eradication, "gender mainstreaming should be an integral part of all small-scale fisheries development strategies" and that these strategies "require different approaches in different cultural contexts and should challenge practices that are discriminatory against women" (FAO, 2015a).

## b) Women-specific challenges

#### a. Limited role in decision-making

- A common area of concern among fisherwomen is their exclusion from positions of power thus restricting their participation in decision making roles.<sup>37</sup>
- Lack of entrepreneurial, financial or market skills and collective organization power for women

<sup>34</sup> Kluth, Meghan, Mar 2016. *Stunning jewellery made from recycled oyster shells.*

<sup>35</sup> <https://india.mongabay.com/2020/03/marine-subsidies-are-a-mess-say-small-scale-fishers-of-southern-karnataka/>

<sup>36</sup> UNCTAD, 2019. Advancing Sustainable Development Goal 14: Sustainable fish, seafood value chains, trade and climate.

<sup>37</sup> [https://d2ouvy59p0dg6k.cloudfront.net/downloads/women\\_conservation\\_fisheries\\_2012.pdf](https://d2ouvy59p0dg6k.cloudfront.net/downloads/women_conservation_fisheries_2012.pdf)

necessitates the formation of cooperatives where fisherwomen represent leadership positions<sup>38</sup>. These cooperatives may help in uplifting the status of fisherwomen community and improve their socio-economic conditions in the country by building strong leadership skills, strengthening entrepreneurial skills, improving the knowledge and expertise of members and leaders.

**b. Lack of training and limited market access**

- Proper training, credit support and access to markets issues in women’s employment in the fishing industry lack of which prevents them reaching their full potential.
- Women fisher folk lack accounting and auditing skills making them vulnerable to exploitation by middlemen, further reducing transparency in operations.

**c. Migration issues**

- Owing to financial and domestic reasons, an influx of migrant men labourers into the fishing industry is observed, limiting benefits for women.<sup>39</sup>

**d. Limited marketing skills**

- Women in entrepreneurial roles sometimes lack the basic skills to assess the quality of catch leading to loss of market and customer base.
- Women have limited knowledge around existing markets and relevant expertise to tap into potential markets for selling their marine catch/produce.

**e. Working conditions**

- Physical security is a major problem faced by fisherwomen. This is perpetuated by the lack of proper infrastructure such as toilets as well as unhygienic and unsafe working environments.
- Other concerns include domestic issues, sexual harassment, high loading charges, restricted access to harbours, paltry wages and problems created by miscreants when these women engage in street vending.
- Even in fish processing factories, women work in difficult conditions, specifically spending longer durations in cold-storage compartments and freezing zones without any protective equipment such as gloves or boots, resulting in gynaecological, dermatological and muscular disorders.<sup>40</sup>

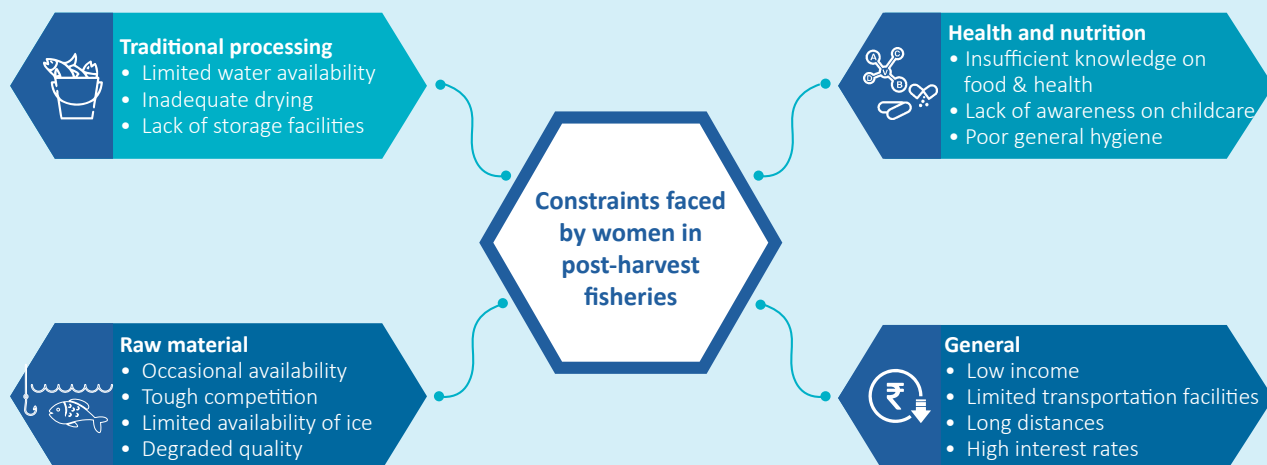
**f. Wage discrimination**

- Another major concern for fisherwomen is that they have no control over income earned from fishing activities. They are engaged in activities with no health, safety or other protection benefits.<sup>41</sup>
- Fisherwomen end up working in poorer conditions at lower wages than fishermen. The wage discrimination ratio in skilled agricultural and fishery workers increased from 0.54 in 2004-05 to 0.60 in 2011-12.<sup>42</sup>

**g. Lengthy process of acquiring credit**

- The entire time-consuming process of acquiring credit is based on stringent regulations. In addition,

**Figure 7 : Challenges faced by women in post-harvest fisheries**



38 USAID, *Advancing Gender in the Environment: Gender in Fisheries: A Sea of Opportunities*.

39 [https://d2ouvy59p0dg6k.cloudfront.net/downloads/women\\_conservation\\_fisheries\\_2012.pdf](https://d2ouvy59p0dg6k.cloudfront.net/downloads/women_conservation_fisheries_2012.pdf)

40 <http://base.d-p-h.info/en/fiches/premierdph/fiche-premierdph-5855.html#:~:text=The%20working%20conditions%20were%20typically,clothing%2C%20gum%20boots%20or%20gloves.>

41 FAO, *Promoting Gender Equality & Women’s Empowerment in Fisheries & Aquaculture*.

42 [https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-new\\_delhi/documents/publication/wcms\\_638305.pdf](https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-new_delhi/documents/publication/wcms_638305.pdf)

most of the women fisher folk fail to meet some of the predetermined conditions to acquire credit. Ensuring timely credit is an added challenge.

**h. Lack of gender-focused policy support**

- Policies addressing gender inequalities in the sector are limited. Women, as a significant part of the sector, contribute immensely to sectoral growth, compared to men. However, their efforts often go unnoticed to policy makers.
- Existing policies fail to capture the pre- and post-harvest contributions made by women in the sector. In addition, sectoral statistics do not consider the proportion of youth and children engaged in the sector<sup>43</sup>.

**c) Skill gaps**

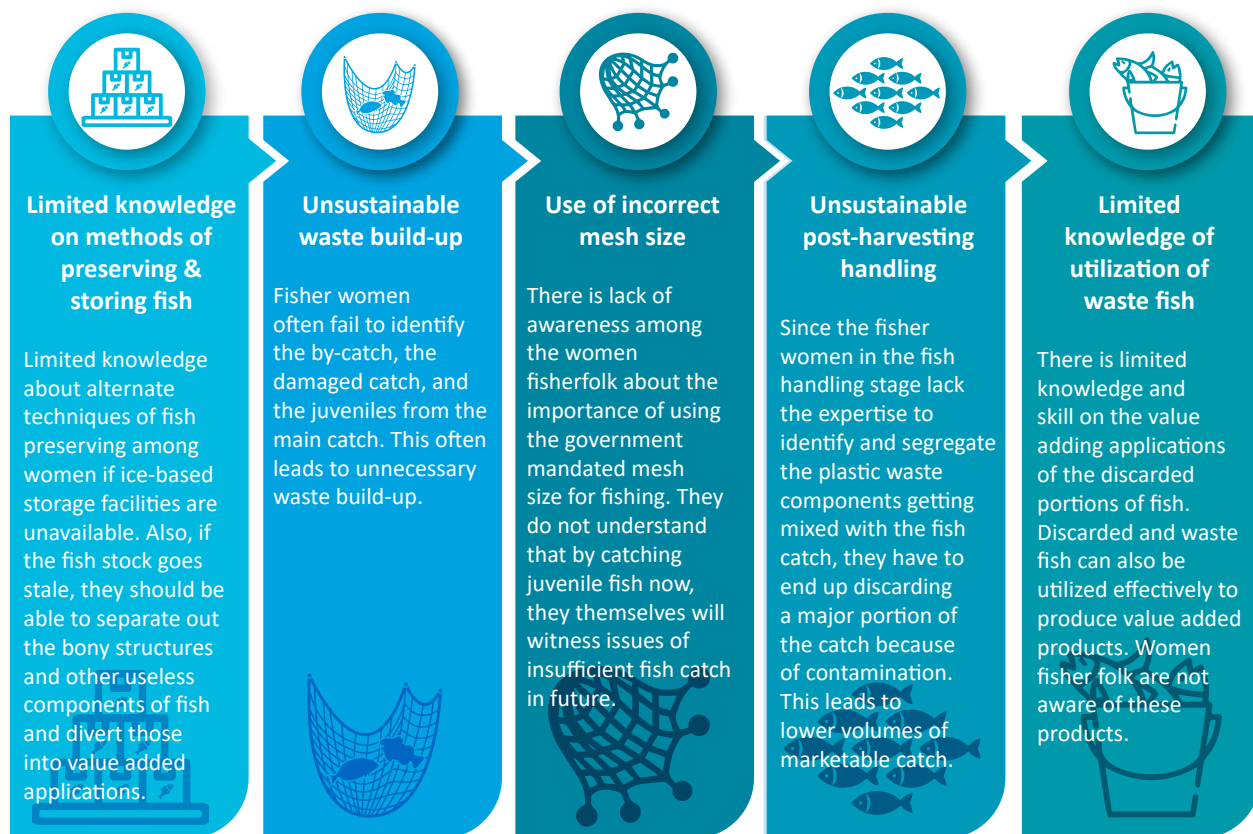
There are a host of skill gaps existing in the marine fisheries sector in India.

Figure 8 lists those that must be addressed to mainstream gender in the sector.

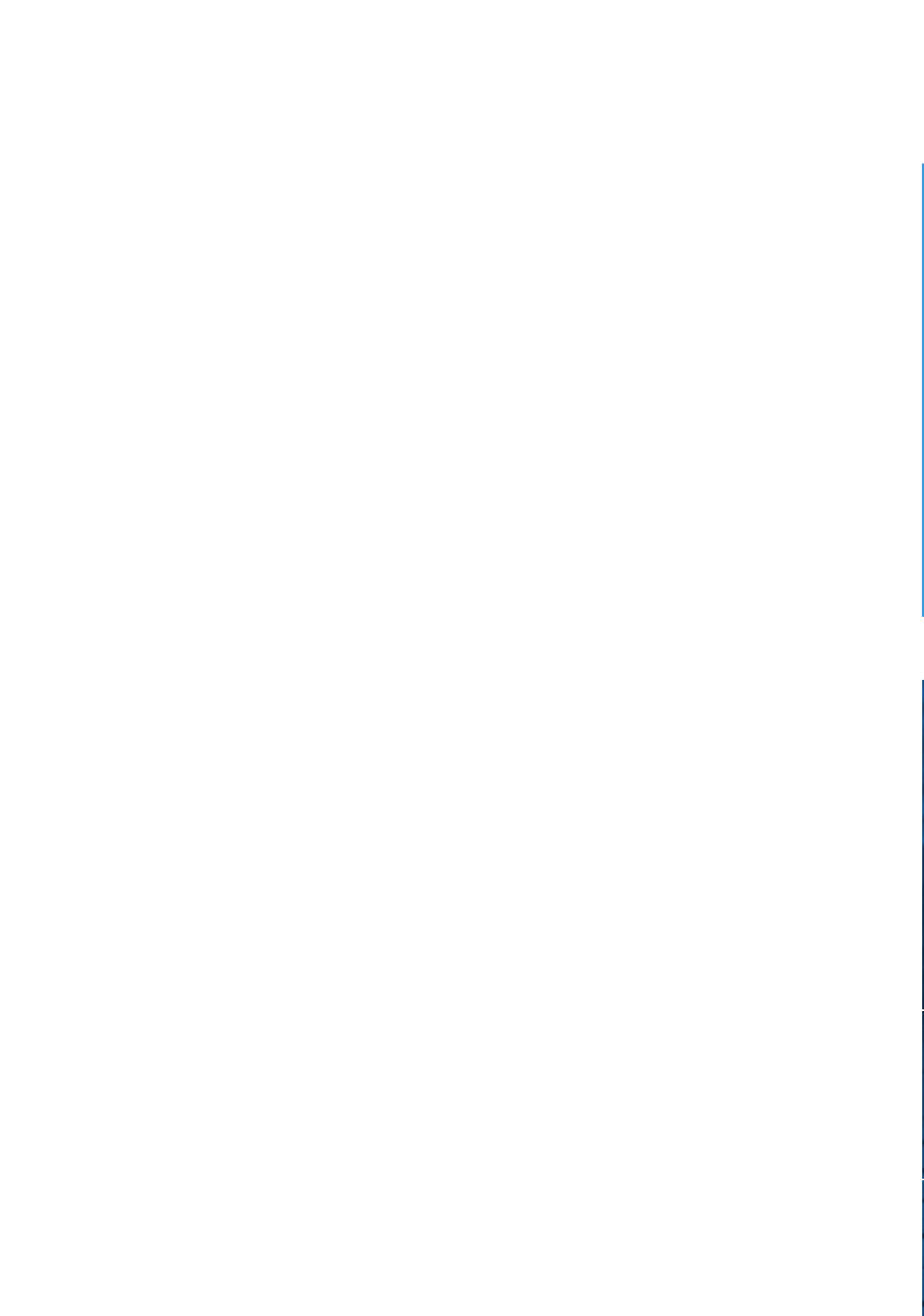
**Impact of COVID-19 on the Fisheries Value Chain**

While ecosystem challenges continue to persist, the COVID-19 pandemic has exacerbated the sector’s troubles. Supply chains are significantly disrupted specifically due to closure of several transport routes, limited port access and increased sanitary as well as regulatory mandates. The tragic effects of the pandemic are especially evident in cases of self-employed small-scale fishers. Largely unorganized and lacking institutional support, a significant proportion of fisher folk families rely on the ecosystem for sustenance. As impacts of COVID-19 continue and fishing season losses continue to mount, the survival of these families is under question. Increased operational costs and mounting debts amidst lack of commercial activity have pushed these families into destitution.

**Figure 8: Skill gaps in fisheries**



<sup>43</sup> FAO, *Promoting Gender Equality and Women’s Empowerment in Fisheries and Aquaculture*.





3.



Policy and Regulatory Frameworks

Several national and state policies and interventions have been designed to support the sector in the long run, generating opportunities for the people

involved to enhance their productivity and support their sustainable growth.

## POLICIES AT THE NATIONAL LEVEL

**Table 2:** Policies at the national level

National Policy for Marine Fisheries 2017
<ul style="list-style-type: none"> <li>• The key objective of this policy is to ensure the ecological integrity and health of India’s marine resources through sustainable measures. The policy has seven pillars:               <ul style="list-style-type: none"> <li>- Principle of subsidiarity</li> <li>- Sustainable development</li> <li>- Precautionary approach</li> <li>- Partnerships</li> <li>- Gender justice</li> <li>- Socio-economic upliftment of the fisher community</li> <li>- Inter-generational equity</li> </ul> </li> <li>• The policy sets aside provisions for sustainable fishing in the following aspects: minimum mesh size, fishing days, engine horsepower, maximum sustainability yield, fleet plans, creation of fisheries management areas, area of operation, gear size, minimum legal size, among others.</li> <li>• Through its Direct Benefit Transfer Scheme, the Government of India will take steps to strengthen welfare measures for the fisher community. This also includes providing amenities such as housing, community welfare, and safety nets.</li> <li>• The policy also states that the government will take steps to strengthen the fisheries cooperatives via technical assistance, financial support and skill development. As regards gender equity, the government will continue to extend support for the welfare of women fisher folk by introducing women-friendly financial support schemes, safe and secure working conditions, value addition activities, hygienic working conditions and establishing women’s cooperatives.</li> </ul>
Draft National Fisheries Policy 2020
<ul style="list-style-type: none"> <li>• The policy released by the Department of Fisheries aims to offer a holistic approach to carry out fishing practices (capture and culture) in a responsible and sustainable manner.<sup>44</sup></li> <li>• The policy entails a productive integration of various other schemes and policies relating to different aspects of fisheries.</li> <li>• The main objectives of the policy include:               <ul style="list-style-type: none"> <li>- Enhancing fish production and productivity in a responsible and sustainable manner</li> <li>- Providing a robust regulatory framework for effective fisheries resource management</li> <li>- Modernizing and diversifying fishing practices in oceans and seas through the use of science and technology</li> <li>- Strengthening and modernizing the value chain</li> <li>- Generating gainful employment and entrepreneurship opportunities leading to the higher income of fishers and fish farmers and improvement of their living standards<sup>45</sup></li> </ul> </li> </ul>
National Scheme for Welfare of Fishermen
<ul style="list-style-type: none"> <li>• This scheme was implemented in 2015-16 to extend financial assistance to the fisher folk for construction of houses, common working areas, tube wells, recreation and community halls, etc.</li> <li>• One of the main rationales of this scheme is to better the lives of fishermen and fisherwomen in the country. The scheme operates on the following three components:               <ul style="list-style-type: none"> <li>- Development of model fishermen villages</li> <li>- Group accident insurance for active fishermen</li> <li>- Saving and relief</li> </ul> </li> </ul>

<sup>44</sup> [http://gov.in/PDF/National\\_Fisheries\\_Policy\\_2020.pdf](http://gov.in/PDF/National_Fisheries_Policy_2020.pdf)

<sup>45</sup> <https://www.manifestias.com/2020/03/05/draft-national-fisheries-policy/>

Under the model fishermen village component, selected fishermen/fisherwomen would be given basic amenities mentioned above. States shall provide the required amenities and infrastructure to their fisher communities.

### National Mariculture Policy 2019

- The National Mariculture Policy aims at ensuring the production of farmed seafood in a sustainable and responsible manner and offering additional livelihood and entrepreneurial opportunities to coastal families so that they can lead a better quality of life.
- The main objective of the policy is to boost mariculture production in a sustainable way while contributing to the socio-economic development of the nation.
- The key objectives of the policy include:
  - Promotion of cooperative partnerships in mariculture by encouraging infrastructural, technical and financial inputs
  - Adoption of an environmentally sustainable approach for the development of mariculture
  - Provision of an enabling environment for the sustainable development of mariculture in India by creating the required policy and legal framework and supporting entrepreneurs venturing into the area of mariculture<sup>46</sup>

### Pradhan Mantri Matsya Sampada Yojana

- Introduced in July 2019, the Pradhan Mantri Matsya Sampada Yojana aims to provide a boost to the processing activity in the fisheries sector in India. This scheme was established under the Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying. One of its key objectives is to foster a robust and dynamic fisheries management framework in the country.
- To promote the allied farm sector which includes fisheries, of the total budget of INR 37.3 billion allocated to the ministry, INR 8.04 billion has been allocated solely to the fisheries department. The funds will be utilized for both marine and inland fisheries. The Government of India also intends to develop a system of attracting funds from the private sector.
- The scheme is expected to address gaps in the fisheries value chain with a special focus on production, infrastructure, quality control, modernization, productivity and, very importantly, post-harvest management. It also lays emphasis on the adoption of sophisticated technologies in the fisheries sector that would ultimately help to reach production targets.

### Blue Revolution Scheme




- In December 2015, the Cabinet Committee on Economic Affairs gave its consent for the implementation of the Blue Revolution, which is an umbrella scheme for the fisheries sector in India. The key objective is the effective management and integrated development of fisheries in the country.
- NFDB was the implementing agency for this scheme covering marine fisheries, inland fisheries and aquaculture. With an outlay of INR 30,000 million, the Blue Revolution initiative also aimed to better the economic conditions of the coastal population in India.
- According to the Indian Ocean Rim Association, the Blue Revolution addressed the following issues:
  - Food security
  - Poverty
  - Climate change impacts
  - Unemployment
  - Socio-economic challenges
- The Blue Revolution scheme is applicable to both marine and inland fisheries. The scheme was approved at a total central outlay of INR 30 billion for implementation.<sup>47</sup>
- The scheme also covers extension of support to women's SHGs by way of developing transportation infrastructure for fish marketing.



<sup>46</sup> <http://nfdb.gov.in/PDF/Revised%20draft%20-%20NMP-2019.pdf>

<sup>47</sup> <https://vikaspedia.in/agriculture/policies-and-schemes/fisheries-related/blue-revolution>

Some of the policies have been analyzed in Table 3.

**Table 3:** Outcome-output framework

Name of Scheme	Activities	Output	Outcome	Impact
National Policy for Marine Fisheries, 2017	<ul style="list-style-type: none"> <li>Implement sustainable fishing measures such as minimum mesh size, fishing days, gear size, minimum legal size</li> <li>Create fisheries management areas</li> <li>Strengthen welfare measures for the fisher community</li> <li>Strengthen fisheries cooperatives via technical assistance, financial support and skill development</li> <li>Extend support for the welfare of women fisher community</li> <li>Provision of amenities such as housing, community welfare, and safety nets</li> </ul>	<ul style="list-style-type: none"> <li>Lower volumes of young fish catch, safe and secure work environments for women, greater proliferation of fisheries and women-based cooperatives, better infrastructure, greater access to the fisher community for financial and technical assistance</li> </ul>	<ul style="list-style-type: none"> <li>Socio-economic upliftment of the fisher community, greater awareness, value addition activities</li> </ul>	<ul style="list-style-type: none"> <li>Ecological integrity, sustainable use of marine resources, gender justice</li> </ul> 
National Scheme for Welfare of Fishermen	<ul style="list-style-type: none"> <li>Development of model fishermen villages</li> <li>Group accident insurance for active fisher folk</li> <li>Extend financial assistance to the fisher folk for construction of houses, common working areas, tube wells, recreation and community halls, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Better infrastructure, greater enrolment of fishermen/ fisherwomen under the Group Accident Insurance scheme</li> </ul>	<ul style="list-style-type: none"> <li>Greater ease in carrying out fishing activities, better working and living conditions</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced sense of income security, better quality of life</li> </ul> 
Pradhan Mantri Matsya Sampada Yojana	<ul style="list-style-type: none"> <li>Check gaps in the fisheries value chain</li> <li>Extend policy, infrastructure and marketing support to increase aquatic resources</li> <li>Modernize fish processing</li> <li>Develop a system of attracting funds from the private sector</li> <li>Introduce sophisticated technologies aimed at enhancing production</li> </ul>	<ul style="list-style-type: none"> <li>Greater fish production, greater employment opportunities, less wastage, improvements in the value chain</li> </ul>	<ul style="list-style-type: none"> <li>Better income levels, positive impact on GDP, better market access, better supply chain management</li> </ul>	<ul style="list-style-type: none"> <li>Better standards of living, better quality of life, sustainable utilization of marine resources</li> </ul> 

Name of Scheme	Activities	Output	Outcome	Impact
Blue Revolution Scheme	<ul style="list-style-type: none"> <li>Develop modern and hygienic infrastructure for fish marketing</li> <li>Develop transportation infrastructure for fish marketing</li> <li>Skill training to fish farmers</li> <li>Establish fish mobile markets</li> <li>Construction of fish landing centres</li> <li>Develop post-harvest infrastructure facilities such as cold storage</li> <li>Provide annual insurance cover to the fisher community</li> </ul>	<ul style="list-style-type: none"> <li>Increase in the number of fish landing centres, increase in the number of skilled fishermen/ fisherwomen, increase in the number of fish markets, greater number of fisher folk covered under insurance</li> </ul>	<ul style="list-style-type: none"> <li>Increase in fish production, better access to markets, greater access to financial assistance, lower wastage due to sophisticated storage technologies, greater value addition</li> </ul>	<ul style="list-style-type: none"> <li>Higher incomes, greater employment opportunities, better standards of living, sustainable fishing practices</li> </ul>  

## POLICIES AND INITIATIVES AT THE STATE LEVEL

### Karnataka

- With a continental shelf area of 27,000 square (sq.) kilometre (km) and a 320 km long coastline, Karnataka has a huge potential in fish production. In

2017-18, the state's total marine production stood at 414 thousand metric tonnes. It is primarily through mechanized fishing boats that nearly 85 percent of the total fish catch is caught. In 2016-17, the state reported marine exports worth INR 15.8 billion.

- Some of the commonly harvested marine resources are listed in Table 4.<sup>48</sup>

**Table 4:** Commonly harvested marine resources in Karnataka

Pelagic Resources	Demersal Resources	Crustacean Resources	Cephalopod Resources
Sardines, shads, anchovies, mackerel, tuna, seer fish, scads, horse mackerel, black pomfret, ribbonfish, full beaks, barracudas	Croakers, lizardfish, soles	Shrimps, lobsters, crabs, stomatopods	Octopus, cuttlefish, squids

### State Policy for the Empowerment of Women, 2018

- The policy focuses on empowering women and taking steps to promote their holistic development. It takes into consideration the plurality and diversity that exists in society and aims at creating a conducive environment for women to participate in all activities and contribute equally.
- A special focus of the policy is women belonging to backward sections of society, minorities, Scheduled Caste or Tribe communities, migrant population and marginalized communities.
- Its objectives are to recognize the role of women in society and acknowledge their contribution to the ecology and economy, to give them equal access to education, health, careers, etc., to strengthen

<sup>48</sup> CMFRI. Annual Report, 2017-18.

legal systems aimed at gender mainstreaming, and to foster a more positive social attitude that ultimately lead to women's upliftment and holistic development.

- A key area of focus is the role of women in agriculture which includes allied activities such as horticulture, animal husbandry, fisheries and sericulture. The objectives are:<sup>49</sup>
  - Extend infrastructure support to women engaged in agriculture and allied activities
  - Augment their capacities through training and capacity-building programmes
  - Introduce women-friendly technologies that ensure occupational safety and health
  - Encourage the concept of resource pooling and group investments in production and marketing activities
  - Develop strategies to protect marginalized women engaged in agriculture and allied activities from the adverse impact of natural calamities and climate change hazards.

### Karnataka Fisheries Development Corporation

- Started in 1970, the Karnataka Fisheries Development Corporation was established under the Companies Act, 1956. Its key objective is the development of the fisheries sector in Karnataka and ensuring the welfare of the fisher community.
- It is a pioneer in setting up of a cold chain and promoting the marketing of marine fish in towns and inland cities of Karnataka. The organization has also been actively involved in conducting deep sea fishing and constructing mechanized boats.
- The main objectives of the corporation are:
  - Provision of quality fish and fish products
  - Supply of ornamental fish and accessories
  - Setting up of modern integrated fish retail outlets in some of the main towns
  - Provision of fishery requisites such as diesel and ice to the fisher folk at reasonable costs
  - Establishment of facilities for the utilization of surplus fish catch to produce fish oil and fish meal
  - Development of a sophisticated cold chain to maintain freshness and hygiene of fish catch

- Additionally, the organization has proposed some of the following schemes:
  - Construction of fish markets under the NFDB and Remunerative Approach for Agriculture and Allied sector Rejuvenation schemes
  - Introduction of mobile fish sales and mobile fish canteens in selected cities of Karnataka
  - Establishment of barge mounted diesel bunks at Mangalore and Malpe fishing harbours
  - Online fish marketing on a pilot basis in Mangalore city
  - Upgradation of Matsydarshini Cubbon Park, Bengaluru, among others.<sup>50</sup>

### Matsya Mahila Swavalambana Scheme

- Introduced in 2006 by the Department of Fisheries, Government of Karnataka, the Matsya Mahila Swavalambana Scheme aims to support the fisherwomen community financially to facilitate their engagement in new post-harvest activities with minimal reliance on money lenders.<sup>51</sup>
- The scheme is now being implemented through three fisheries federations: the Karnataka State Cooperative Fishermen Federation, Mysore; Dakshina Kannada and Udupi District Cooperative Fish Marketing Federation (Ltd), Mangalore; and Uttara Kannada District Cooperative Fish Marketing Federation Ltd, Karwar, the latter two dealing with the marine fisheries sector only.
- Main objectives of the scheme include:
  - Focus on strengthening livelihoods of fisherwomen located both in coastal and inland regions across the state
  - Assistance in economic activities such as production of fish fingerlings, purchase of craft and gear in respect of inland fisheries
  - Assistance in fish curing salting, drying, processing, silage and manure production and oil extraction, etc., in marine fishing activities.<sup>52</sup>

### Maharashtra

- With a 720 km long coastline, Maharashtra is one of the main maritime states of India with a flourishing marine fisheries industry. Sindhudurg, Raigad,

<sup>49</sup> Government of Karnataka, 2018. State Policy for the Empowerment of Women –Draft.

<sup>50</sup> Karnataka Fisheries Development Corporation, <https://kfdcfish.com/>

<sup>51</sup> [https://kmea.karnataka.gov.in/storage/pdf-files/Reports%20and%20other%20docs/Evaluation%20of%20the%20Mathsya%20Mahila%20Swavalambana%20scheme%20\(1\)\\_0.pdf](https://kmea.karnataka.gov.in/storage/pdf-files/Reports%20and%20other%20docs/Evaluation%20of%20the%20Mathsya%20Mahila%20Swavalambana%20scheme%20(1)_0.pdf)

<sup>52</sup> [https://kmea.karnataka.gov.in/storage/pdf-files/Reports%20and%20other%20docs/Evaluation%20of%20the%20Mathsya%20Mahila%20Swavalambana%20scheme\\_0.pdf](https://kmea.karnataka.gov.in/storage/pdf-files/Reports%20and%20other%20docs/Evaluation%20of%20the%20Mathsya%20Mahila%20Swavalambana%20scheme_0.pdf)



**Table 5:** Commonly harvested marine resources in Maharashtra

Pelagic Resources	Demersal Resources	Crustacean Resources	Cephalopod Resources
Bombay duck, carangids, Indian mackerel, seer fish, tuna, ribbonfish, anchovies, oil sardine	Croakers, catfish, soles, silver pomfret, rock cods, snappers, pig face breams, threadfin breams, silver bellies	Lobsters, penaeid shrimps, non-penaeid shrimps, crabs, stomatopods	Indian squid, cuttlefish, cephalopod

Thane, Ratnagiri and Mumbai are the five maritime districts of the state. The state's total continental shelf area is 112,000 sq. km.<sup>53</sup>

- Fish biodiversity in Maharashtra creates a strong foundation for fisheries development in the state. The state has been witnessing dwindling marine resources due to factors such as overfishing, urbanization, habitat degradation and industrial pollution. Some commonly harvested marine resources are listed in Table 5.<sup>54</sup>

#### Mangrove and Coastal and Marine Biodiversity Conservation Foundation

- UNDP in alliance with the Indian Ministry of Environment and Forests launched a mangrove and coastal and marine biodiversity conservation project focussing on mainstreaming biodiversity conservation in the Sindhudurg coastal district's production sectors. The project was aimed at creating awareness among the local communities on conservation of coastal and marine biodiversity along the coast of Maharashtra.
- To motivate the local communities to conserve mangrove, mangrove crab farming was initiated in 15 villages with around 149 beneficiaries being trained.
- The project was financed by Global Environment Facility with a total investment of US\$3,438,294.
- 100,000 mangrove saplings were planted and around 25 mussel and oyster farming units were set up by women's SHGs.
- As a part of the project, awareness programmes were conducted on a regular basis to educate the small-scale fishermen/women and fisheries

department staff on biodiversity conservation and sustainable marine fishing practices.<sup>55</sup>

#### Department of Fisheries

- The Department of Fisheries focuses on supporting the marginalized and economically backward fishing community and improving the fisheries sector in the state.
- The department lays great emphasis on the adoption of modern and sophisticated methods of sustainable fishing. While it generates employment opportunities in the fisheries sector, it also promotes fish production to meet domestic and export needs. It develops strategies for the future keeping in view the prevailing threats, weaknesses, trends, opportunities and future projections.
- The objectives of the department for the marine fisheries sector are:
  - Modernization of existing jetties and harbours in the state
  - Construction of new fishing harbours wherever feasible
  - Introduction of sea ranching and mariculture in the state
  - Implementation of measures to modernize the intermediate fishing crafts
  - Initiatives to carrying out deep sea explorations
  - Ensure the welfare and cater to the needs of the fishing community
  - Implement capacity-building programmes for the fisher community in the state
  - Encourage sustainable fishing practices and spread awareness on it
  - Work towards gender mainstreaming
  - Strengthen marketing infrastructure.<sup>56</sup>

<sup>53</sup> CMFRI Marine Fisheries Census, 2010.

<sup>54</sup> CMFRI. Annual Report, 2017-18.

<sup>55</sup> [https://www.in.undp.org/content/india/en/home/operations/projects/environment\\_and\\_energy/mainstreaming-coastal-and-marine-biodiversity-into-production-se.html](https://www.in.undp.org/content/india/en/home/operations/projects/environment_and_energy/mainstreaming-coastal-and-marine-biodiversity-into-production-se.html)

<sup>56</sup> <https://fisheries.maharashtra.gov.in/1035/%E0%A4%AE%E0%A5%81%E0%A4%96%E0%A5%8D%E0%A4%AF-%E0%A4%AA%E0%A5%83%E0%A4%B7%E0%A5%8D%E0%A4%A0>

## Rainbow Revolution Scheme

- The Rainbow Revolution Scheme was introduced in Maharashtra in 2007 and it covers nearly 305 male and female beneficiaries. The scheme aims at encouraging the rearing and breeding of ornamental fish for domestic and international markets.
- This scheme holds promise for boosting women's livelihood opportunities in the marine fisheries sector. With nearly 1.8 million people in India engaged in activities such as handling, processing, curing, peeling, selling, marketing and trading of marine resources, this scheme has gained popularity in Maharashtra as well as in other states where it was introduced such as Rajasthan, Tamil Nadu and West Bengal.
- Women make up 48 percent of the 1.8 million population engaged in the marine fishing related activities. The Rainbow Revolution Scheme focuses on giving equal opportunities to male and female fisher folks in ornamental fish breeding and rearing. Additionally, it also extends financial assistance to various groups of beneficiaries categorized into Grade I, Grade II and Grade III depending on their scale of operations.<sup>57</sup>

## Odisha

- With a 480 km long coastline, Odisha makes up around 6 percent of the total coastline of India. Some of the key maritime districts of the state are Kendrapara, Balasore, Ganjam, Bhadrak and Jagatsinghpur.
- In terms of bottom trawl fishery resources, Odisha ranks number one followed by Andhra Pradesh and then West Bengal. With around 57 landing centres

and 641 fishing villages, Odisha boasts of 120,000 fisherfolk engaged in motorized and non-motorized fishing craft. Total fish production in the state in 2017-18 stood at 608,000 metric tonnes.<sup>58</sup>

- To reach this ambitious target of increasing productivity to 5 tonnes per hectare in the years to come., the state has framed the Odisha Fisheries Policy in September 2015.
- The fisheries sector in Odisha aims to maximize utilization of water bodies, generate employment opportunities in the sector, improve conditions of the traditional fisher folk and double their incomes, conserve marine and aquatic resources and maintain genetic diversity, among other goals.
- Some commonly harvested marine resources are listed in Table 6.<sup>59</sup>

## Matsyajibi Unnayana Yojana

- The Matsyajibi Unnayana Yojana was introduced for the fisher community in 2011 in Odisha, primarily as a welfare package. The main guidelines of the scheme focus on:
  - Award of scholarships to meritorious children of the fisher community; and
  - Financial assistance to fisherwomen's SHGs.
- The scholarship initiative aims to encourage the children of fishermen/fisherwomen to pursue higher education. The financial assistance extended to fisherwomen SHGs enables them to tackle the challenges pertaining to fish procurement and marketing; due to financial scarcity they often resort to borrowing funds from private sources which has its own share of challenges. As regards fish marketing, the scheme extends support to the fisher community for transportation of fish in hygienic conditions thereby ensuring the

**Table 6:** Commonly harvested marine resources in Odisha

Pelagic Resources	Demersal Resources	Crustacean Resources	Cephalopod Resources
Sardines, shads, Bombay duck, Indian mackerel, seer fish, ribbonfish, carangids, half beaks and full beaks	Catfish, goatfish, eels, lizardfish, silver bellies, perches, croakers, pomfrets, flatfish	Cephalopods	Penaeid prawns, non-penaeid prawns, crabs, lobsters, stomatopods

<sup>57</sup> <http://www.asianfisheriessociety.org/publication/downloadfile.php?id=1181&file=Y0dSbUx6QXdOVFI6TkRFd01ERTFNVE0TmPVNE9UTXVJR1Jt>

<sup>58</sup> CMFRI Marine Fisheries Census, 2010.

<sup>59</sup> CMFRI. *Annual Report, 2017-18*.

freshness of the catch. It reduces the transit period required to transport fish from the landing centre to the doorstep of the consumer but also ensures livelihood opportunities for fishermen and fisherwomen. In 2017-18, funds worth INR 200,000 were released to a revolving fund for fisherwomen SHGs with the target of covering 40 such SHGs during that period.<sup>60</sup>

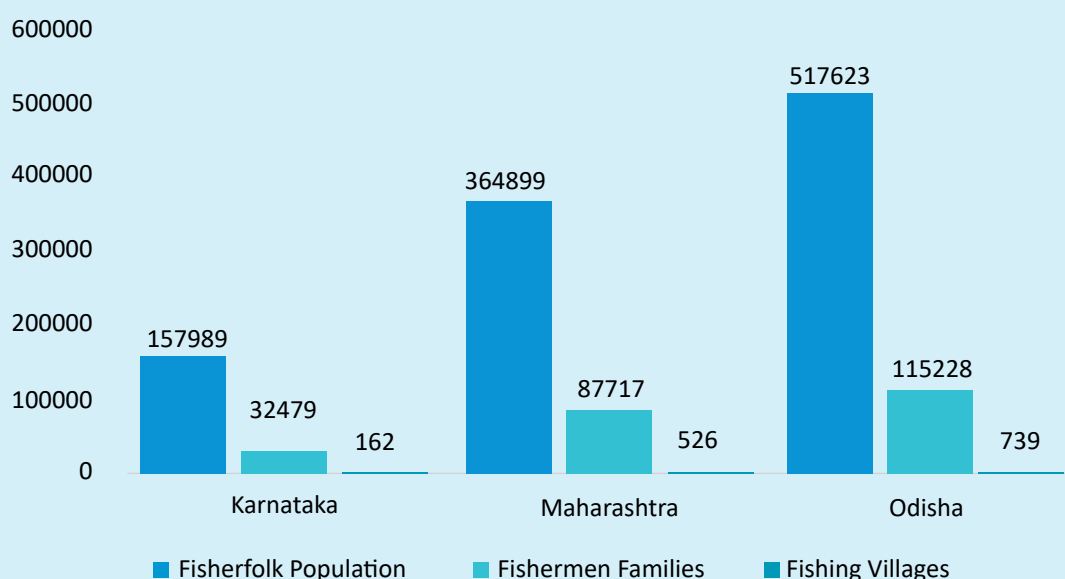
### Odisha Fisheries Policy, 2015

- The policy focuses on addressing gaps in the regulatory framework, protecting and achieving nutritional security, encouraging sustainable utilization of marine and aquatic resources, promoting livelihoods and ensuring livelihood security among the fisher community.
- Other objectives are promoting environmentally sustainable harvesting and production of fish, establishing linkages for profitable marketing of products, encouraging capacity building initiatives for the fisher community and maintaining high standards of fish processing and storage methods.
- As regards marine fishing, the policy has the following objectives:
  - Advocating conservation and protection of marine resources

- Promotion of resource-specific fishing methods
- Protection of turtle breeding grounds while also safeguarding the livelihood opportunities of the fisher community
- Ensure marine diversity by deploying sea ranching and artificial reefs along the coast
- Encourage communities to effectively participate in fisheries management
- Promote mariculture as a feasible alternative to fishing
- Develop infrastructure to ensure the hygienic handling of fish, dry fish processing, and production of other types of value-added fish-based products for women’s SHGs
- Create awareness among the fisher community about the need for sustainable fishing
- Ban destructive fishing activities.<sup>61</sup>

Fisherwomen in Kerala play a significant role in the sector as they are actively involved in fishery-related activities. They have created their own SHGs.<sup>62</sup> The fishing community in Kerala, through the Society for Assistance to Fisherwomen, has enhanced the socio- economic condition of fisherwomen and helped to mainstream them. The main objective of the programme was to improve the livelihood of fisherwomen in the state after the 2004 tsunami.<sup>63</sup>

**Figure 9:** Fisher communities in Maharashtra, Karnataka and Odisha<sup>64</sup>



<sup>60</sup> <http://fardodisha.gov.in/?q=node/261>

<sup>61</sup> <http://www.indiaenvironmentportal.org.in/content/418892/odisha-fisheries-policy-2015/>

<sup>62</sup> <http://www.ifpkochi.nic.in/Fisherwomen%20empowerment.pdf>

<sup>63</sup> [http://granthaalayah.com/Articles/Vol5Iss7/13\\_IJR17\\_A06\\_452.pdf](http://granthaalayah.com/Articles/Vol5Iss7/13_IJR17_A06_452.pdf)

<sup>64</sup> Department of Fisheries Ministry of Fisheries, Animal Husbandry & Dairying, 2018. *Handbook on Fisheries Statistics*.

## TRAINING OFFERED IN THE SECTOR

Imparting appropriate training and providing technical assistance at various phases of the value chain is

imperative to increase meaningful participation and improve knowledge and skills required in the sector, particularly of the fisherwoman community.

### Maharashtra

**Table 7:** List of training institutes in Maharashtra

Name of Organization	Brief about the Organization	Thrust Areas of the Organization	Types of Projects Undertaken
<b>Department of Fisheries, Government of Maharashtra</b>	The Department of Fisheries is an administrative department of the Ministry of Agriculture, Animal Husbandry, Dairy Development and Fisheries. Other wings of the department include Maharashtra Fisheries Development Corporation, Mumbai; Taraporewala Marine Biological Research Station, Mumbai; Fisheries College, Konkan Krishi Vidyapeeth, Ratnagiri; and Maharashtra Animal & Fisheries Science University, Nagpur	Fish culture, protection and conservation of marine resources, sustainable fishing, optimized fish production, modernization in fishing technology, infrastructure development, employment generation	Mechanization of fishing crafts, training and extension, aquaculture, mariculture, fish processing technologies and skill development in processing technologies, post-harvest technology, deep sea fishing, manpower development, strengthening marketing infrastructure <sup>65</sup>
<b>Central Marine Fisheries Research Institute, Mumbai</b>	Established by the Government of India in 1947, CMFRI is a leading institute in the world today working in the area of marine fisheries research. Earlier the institute's focus was on capture fisheries production, however, due to surging demand, CMFRI also started working in the areas of sea farming and coastal mariculture. With its headquarters in Kochi, CMFRI has research branches in Mumbai, Karwar, Mangalore, Kozhikode, Tuticorin and Chennai	Research, marine capture fisheries, mariculture, biodiversity, marine biotechnology, fishery environment, and fishery economics and extension	Research, conservation of marine fish, broodstock development, livelihood opportunities, skill development, seed production, cage farming, ornamental fishing, biodiversity valuation
<b>Jaljeevika</b>	A non-profit organization, Jaljeevika aims to address livelihood issues of the fisherfolk community. One of the main areas of focus is the sustainability of aquatic resources with close attention to the livelihood requirements of the fisherfolk population. The organization promotes aquatic livelihoods and small-scale fishing among the marginalized communities	Institution building, skill development, aqua entrepreneurship, research and advocacy, and training and capacity building	Strengthening fisheries-related farmer producer organizations, strengthening fishery cooperatives, developing and managing women's SHGs, enterprise promotion, access to government schemes, business planning, financial inclusion programmes, knowledge dissemination, improvements in value chain, market linkages <sup>66</sup>

<sup>65</sup> <https://fisheries.maharashtra.gov.in/1035/मुख्य-पृष्ठ>

<sup>66</sup> <https://jaljeevika.org/>

## Karnataka

**Table 8:** List of training institutes in Karnataka

Name of Organization	Brief about the Organization	Thrust Areas of the Organization	Types of Projects Undertaken
<b>Karnataka Fisheries Development Corporation</b>	Established under the Companies Act, 1956, the Karnataka Fisheries Development Corporation is actively engaged in activities such as deep-sea fishing operations and training, construction of mechanized boats, establishment of cold chains, and marketing of marine fish in the state	Fish marketing, harbour maintenance, implementation of schemes and policies, sale of ice, sale of diesel, running cold chains, establishing hygienic fish markets, developing infrastructure for post-harvest and processing technologies	Marketing of marine fish, sustainable fishing practices, skill trainings, production of fish meal and fish oil, fish retail, ornamental fishing, provision of high quality of fish and fish products <sup>67</sup>
<b>Central Marine Fisheries Research Institute, Karnataka</b>	Established by the Government of India in 1947, CMFRI is a leading institute in the world today working in the area of marine fisheries research. Earlier the institute's focus was on capture fisheries production, however, owing to surging demand, CMFRI also started working in the areas of sea farming and coastal mariculture. With its headquarters in Kochi, CMFRI has research branches in Mumbai, Karwar, Mangalore, Kozhikode, Tuticorin and Chennai	Research, marine capture fisheries, mariculture, biodiversity, marine biotechnology, fishery environment, and fishery economics and extension	Research, conservation of marine fish, broodstock development, livelihood opportunities, skill development, seed production, cage farming, ornamental fishing, biodiversity valuation <sup>68</sup>
<b>Karnataka State Women's Development Corporation (KSWDC)</b>	Established in 1987, the KSWDC aims to improve and enhance the socio-economic conditions of marginalized women in the state. It also creates awareness and encourages women to avail of financial services from banks and other formal financial institutions. Additionally, the organization also extends training to women on marketing, general accounting, report preparation, and materials management	Social development of women, assistance for forming women's SHGs and non-governmental organizations, technical assistance to marginalized women, promote entrepreneurship among women, strengthen women's cooperatives and similar organizations	Welfare of women street vendors, micro credit for entrepreneurial ventures, skill trainings in marketing and sale of products, identification of potential markets, skill development for self-employment <sup>69</sup>

<sup>67</sup> <http://kfdcfish.com/>

<sup>68</sup> <http://www.cmfri.org.in/mangalore>

<sup>69</sup> <https://bangalorerural.nic.in/en/karnataka-state-women-development-corporation/>

Name of Organization	Brief about the Organization	Thrust Areas of the Organization	Types of Projects Undertaken
<b>Vrutti</b>	Vrutti focuses on enhancing people's wellbeing through sustainable livelihoods and transformative actions. The main rationale of the organization is to empower small and marginalized producers to grow out of poverty and have more sustainable employment opportunities	Livelihood solutions for the marginalized population, marginalized communities, fisherfolk communities, and farmers, sustainable livelihoods, skill trainings, financial inclusion, developing producer organizations, social protection services	Sustainable fishing practices, fish marketing, skill training to fisherfolk communities, empowering artisanal marine fisherfolk, training and financial assistance to producer institutions <sup>70</sup>

## Odisha

**Table 9:** List of training institutes in Odisha

Name of Organization	Brief about the Organization	Thrust Areas of the Organization	Types of Projects Undertaken
Fisheries and Animal Resources Development Department, Government of Odisha	This department focuses on the welfare of the fisherfolk community in the state and promotes scientific aquaculture. It lays down the schemes and guidelines pertaining to the fisheries sector	Fisheries-related infrastructure development, post-harvest operations, employment and skill development, sustainable fish production	Fish seed production, skill development, welfare of fishermen, training and capacity building, application of technologies, fish processing technologies <sup>71</sup>
Fishfed, Odisha	Registered under the Odisha Cooperative Societies Act, 1962, Fishfed is the main supervisory body for all primary fishermen's cooperative societies in Odisha. While there are a host of activities being carried out by Fishfed, the organization also supports infrastructure development for the fisheries sector in the state	Fish production and marketing, hygienic production of fishery products, financial assistance to affiliated societies, training to fishermen, procurement of fish and related products from Primary Fishermen's Cooperative Societies	Skill development of fisherfolks, hygienic fish marketing, maintenance of jetties, maintenance and construction and jetties, harbours and fish landing centres, capacity building, fish feed plant development, developing cold chain facilities <sup>72</sup>

<sup>70</sup> <https://vrutti.org/>

<sup>71</sup> <http://www.fardodisha.gov.in/>

<sup>72</sup> <http://www.fishfedodisha.com/home.html>



Name of Organization	Brief about the Organization	Thrust Areas of the Organization	Types of Projects Undertaken
Nirman	Nirman is a civil society organization that aims at ensuring livelihood security of the marginalized farmers, enhancing food security, empowering rural, tribal and marginalized communities, through collective action and developing local self-governing bodies	Skill building, small fisheries development, women's empowerment, sustainable fishing practices, and biodiversity conservation	Sustainable small-scale fisheries, empowerment of marginalized communities, skill development for better livelihoods in fisheries <sup>73</sup>
ICAR-Central Institute for Women in Agriculture, Odisha	The ICAR-Central Institute for Women in Agriculture is engaged in gender-based research in agriculture and its allied sectors. It focuses on equipping marginalized women with the required skills and knowledge base for them to become financially independent and create sustainable livelihood options for themselves	Home science, horticulture, crop science, fisheries, livestock, farm machinery and power	Gender mainstreaming and women's empowerment in fisheries, fisheries technologies, ornamental fish culture, livelihood improvements for rural women <sup>74</sup>

<sup>73</sup> <https://www.nirmanodisha.org/our-work.html>

<sup>74</sup> <http://icar-ciwa.org.in/>



4.

# Potential Pathways

The image features a blue-tinted photograph of a group of people in a small boat on the water. The background is composed of abstract geometric shapes in various shades of blue and white, creating a modern, layered effect. The text '4.' is positioned in the upper left, and 'Potential Pathways' is centered in the lower half.

The shift towards green growth in the fisheries sector requires significant investment in the areas of green technology and awareness-building on the urgent need for sustainable fisheries and aquaculture. Green technologies include low impact, fuel-efficient fishing methods; innovative multi-trophic aquaculture production systems using environmentally friendly feeds; reduced energy use and greener refrigeration technologies; and improved waste management in fish handling, processing and transportation.

## RECOMMENDATIONS TO ENHANCE WOMEN'S PARTICIPATION

Even though women play a significant role in the marine fisheries sector, their economic contribution often goes unreported and is invisible. They may engage as paid or unpaid workers both in pre and post-harvest activities, yet lack the attention they merit in terms of support through hygienic working conditions, health care and insurance, childcare support and proper water and sanitation needs.

Women's participation in the sector can be effectively harnessed in the growth and sustainable development of the fisheries sector. Inherent capabilities of women critical to this sector must be combined with skilling and adequate infrastructural support to improve efficiency and productivity.

### Create and support women's cooperatives and associations

- Imparting training on sustainable fisheries management to cooperative members and offering training grants to these cooperatives so as to conduct skill development workshops for women on sustainable fishing activities.
- Providing marketing support to women's cooperatives (i.e., branding and promotional tools, certifications, etc.).
- Designing, developing, and monitoring financial services that meet fisherwomen's diverse and differentiated needs, such as microcredit schemes, mobile finance and savings mechanisms as some of the processes in the fisheries value chain are

- investment intensive such as storage, logistics, etc.
- Developing sector-specific and gender-specific schemes that consider the various differences between the post-harvest sector and aquaculture sector.
- Ensuring sustainable fisheries and tenure issues consider the requirements of women and factors such as better working conditions and wage disparity.
- Conducting financial literacy workshops for women to ensure marginal fisherwomen do not have to rely on informal sources of finance. Additionally, it would be useful to link cooperatives to local financial institutions to improve access to credit. For instance, Kerala State Cooperative Federation for Fisheries Development Ltd. (Matsyafed) offers interest-free loans to fisherwomen vendors with the help of the state government to control informal credit mechanisms in the sector. The organization, as a part of its micro-credit scheme, also arranged credit linkages with the National Backward Class Finance & Development Corporation and National Minority Finance Development Corporation at 6 percent interest per annum for SHGs. These provisions, with support from local and state governments, can be made available to fisherwomen in other states as well.<sup>75</sup>

### Development of robust databases for informed policy decisions and effective implementation

- Gathering baseline data on female labour in fisheries, distribution of women within different economic strata, education levels, special skills and their social status in fisheries, etc., to identify target groups for policy interventions is necessary.
- Conducting research studies on working conditions, income, quality of life indicators, welfare benefits, healthcare, education, ability of women to find jobs in the fisheries sector, etc., shall help in understanding baseline scenario and gaps in the ecosystem.<sup>76</sup>

### Enhanced role of industry bodies

- Gender mainstreaming requires push from industry bodies to encourage procurement from women-led enterprises and SHGs. Price floor and flow of

<sup>75</sup> <https://www.matsyafed.in/?q=self-employment-schemes>

<sup>76</sup> FAO, 2014. *Value chain dynamics and the small-scale sector- Policy recommendations for small-scale fisheries and aquaculture trade.*

technical skills around quality assessment and storage shall improve productivity and profitability of these enterprises.

- Legal contractual agreements with well-defined procurement quantities and price floor may also be introduced to guarantee income to small-scale farmers and enhance commercial attractiveness of the sector.

## 4.1 SUGGESTED ACTION PLANS

The following case studies form compelling evidence for the promotion of eco-entrepreneurship models in the marine and inland fisheries sector across states.

### Case Study 1: From day labourer to hatchery owner

Regardless of her bumpy 20-year journey, Bina Majhi, a former day labourer, was successful in setting up her fish hatchery business from scratch and emerged as an accomplished businesswoman and a fish farmer.

Back in 1992, Bina and her husband worked as day labourers in a hatchery. The meagre income they received was not sufficient to sustain their family. So, with little savings in hand, they started selling fingerlings so as to supplement their earnings. After few years, Bina started a nursery pond with hatchlings she had bought from a nearby hatchery, marking the beginning of her own hatchery business.

A few years down the line, Bina was a part of the Danish International Development Agency (DANIDA) -supported Patuakhali Barguna Aquaculture Extension project that aimed at promoting integrated fish and vegetable farming. Over the next five years, she was successful in expanding her business until the 2005 tsunami struck, exterminating all the fishes in her pond, followed by the 2007 Cyclone Sidr, leaving Bina and her husband in penury.

With technical aid from the WorldFish-DANIDA-initiated quality seed project, they were able to set up their business once again. In 2013, the hatchery received support from the USAID-funded and WorldFish-led Aquaculture for Income and Nutrition project. The plan

was aimed at increasing the productivity of fish farms and assisting people such as Bina by offering them training in areas like nursery management, quality fish spawn production, feed and brood management, brood rearing and breeding techniques. Through training, quality service, communication with other nursery managers and the support from her family, Bina has emerged as a successful hatchery owner.<sup>77</sup>

This case study represents an eco-entrepreneurship model for the aquaculture sector. A similar model can be applied within other states explored in this study, i.e., Karnataka, Maharashtra and Odisha.

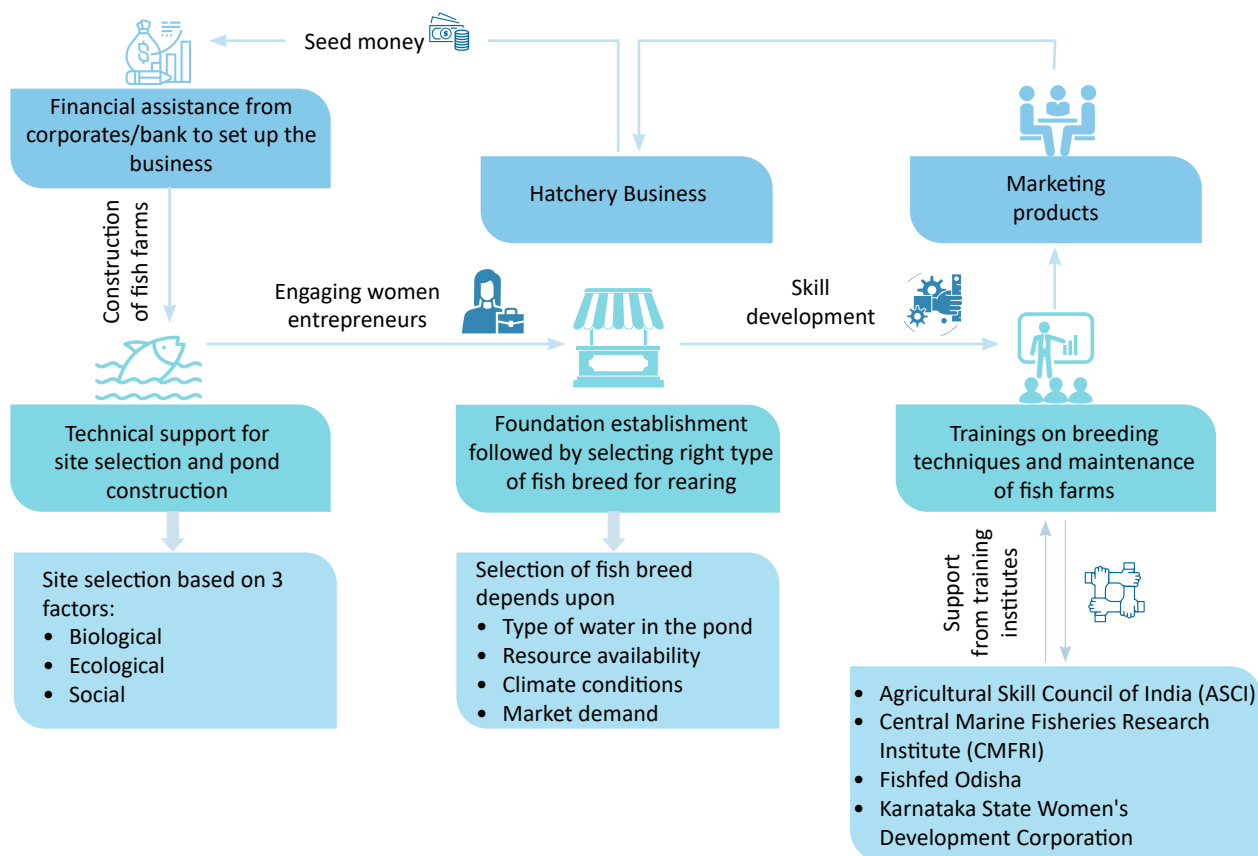
### Model 1: Entrepreneurship model for hatchery management

- To set up fishponds, seed investment from government or private organizations to assist fisherwomen is required. Financial bodies such as the National Bank for Agriculture and Rural Development (NABARD) and National Cooperatives Development Corporation (NCDC) may help these women entrepreneurs to start their business.
- The next step is technical assistance from organizations such as CMFRI and Central Institute of Coastal Engineering for Fishery (CICEF) to construct the ponds. Before construction activity begins, it is important to select the right type of site, with good water supply, depending upon biological, ecological and social factors.
- After construction activity, the next step is to decide on the right type of fish breed for rearing purposes, which is influenced by factors such as type of water in the pond, resource availability, climate conditions and market demand. While rearing fish in ponds, fish feeding is important so as to ensure that the fish attain maximum weight as per the market standards.
- Fish farming in India is a profitable business and thus it is critical for women entrepreneurs to have sufficient knowledge about maintaining a fish farm. Imparting training to them on maintaining the water pH, occasional water treatments, establishing a customer base, etc., is therefore vital.<sup>78</sup>

<sup>77</sup> <https://www.worldfishcenter.org/pages/binas-success-story-bd/>

<sup>78</sup> <https://www.farmingindia.in/fish-farming/#:~:text=Climate%2C%20soil%2C%20water%20and%20topography,have%20good%20water%20retention%20capacity.>

**Figure 10:** Entrepreneurship model for hatchery management



### Case Study 2: Successful fish kiosk entrepreneurs of Tamil Nadu

The fish kiosk located at Marthandam, Tamil Nadu, is one of 12 supported by Tamil Nadu's Department of Fisheries as part of the World Bank-supported Coastal Disaster Risk Reduction Project. The programme is aimed at providing infrastructural facilities, skill development opportunities in various aspects of the fisheries ecosystem and entrepreneurship training programmes to widows from fisher communities who have lost their husbands at sea.

The fish kiosk is managed by three women – Celine Mary, Mary Shanti and Chandra – and is known for its quality fish stocks and good hygiene levels which has resulted a loyal clientele. After losing her husband to disease caused by spending long hours at sea, Celine Mary was left in a state of penury. The kiosk, for her, turned out to be a solution to end her poverty and

gruelling struggle. The kiosk now earns up to INR 6,000 per day in revenues, with a profit margin of 20-30 percent and provides the owners with an improved lifestyle.

The women still require certain skills that will allow them to catapult their business to the next level. Some of these include developing a business plan, projecting costs and revenues, undertaking risk assessment and using available government schemes to raise capital.<sup>79</sup>

A similar model can be implemented in other states in this study where women can themselves engage in marine fishing activities and set up fish kiosks with assistance from different organizations at each level. There are some schemes and policies as well that focus on women from marginalized communities and extend support to women engaged in fishing activities in these states.

<sup>79</sup> <https://www.worldbank.org/en/news/feature/2018/05/01/fishing-for-success-the-fish-kiosk-entrepreneurs-of-tamil-nadu>



## Model 2: Entrepreneurship model for fish kiosk

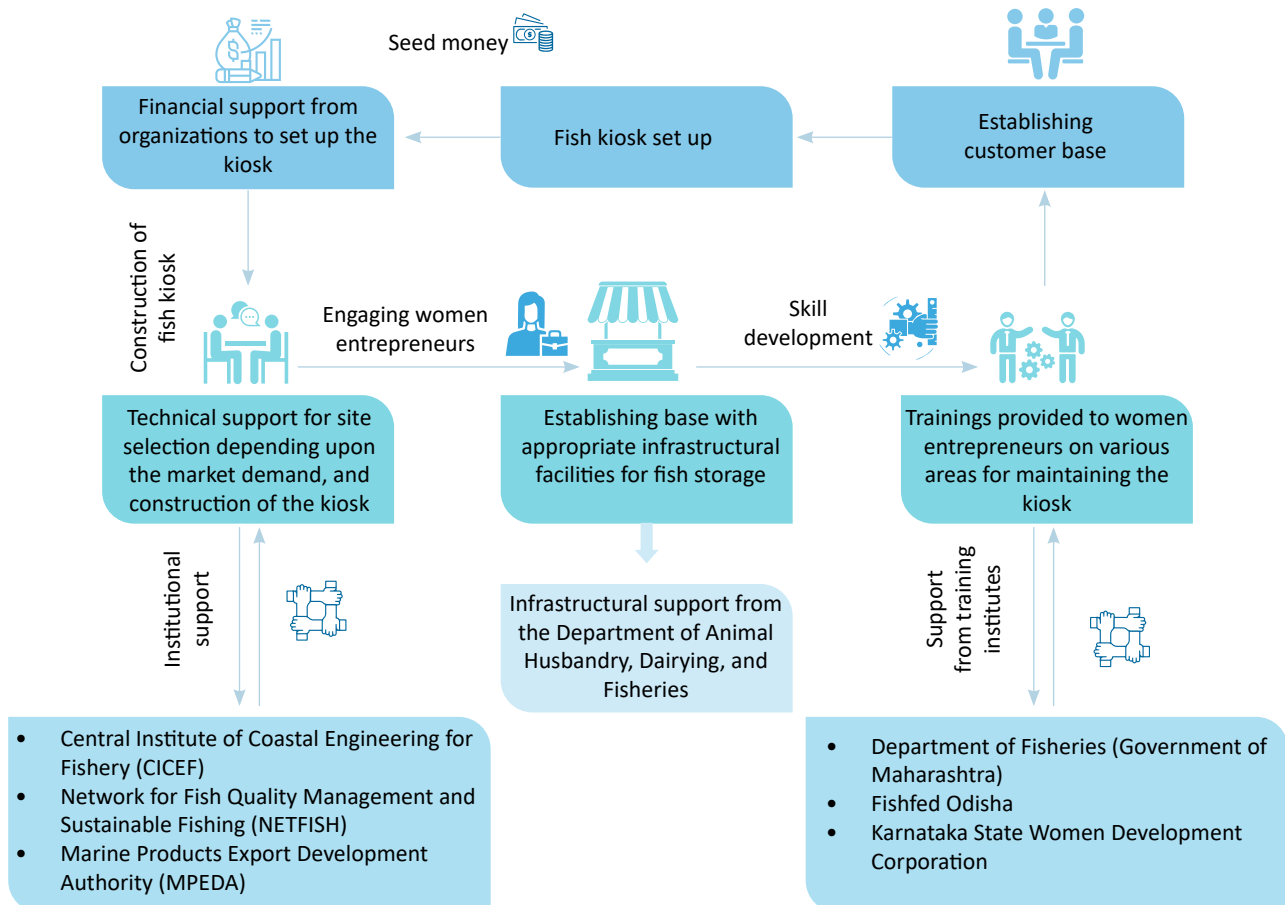
- Setting up of fish kiosks requires financial support from the government or corporates to fisherwomen. Financial bodies such as NABARD, Vrutti (Karnataka) and NCDC may help women entrepreneurs to start their businesses.
- Technical assistance can be requested from organizations such as CMFRI and CICEF to construct the kiosks, preferably at locations within the radius of marketplaces with large consumer bases, making it easy to sell the fish products. Analysis of the site is required so as to check the availability of basic amenities including water supply, electricity supply and safety of women entrepreneurs, etc.
- Setting up of the kiosk also requires appropriate infrastructural facilities such as storage centres, freezers for fish catches and fish products as well as toilet facilities for women.
- Engaging women entrepreneurs to operate the kiosks demands some level of skill development among fisherwomen. Thus, appropriate training in assessing the quality of catches, fish preservation

and storage methods, marketing techniques, communication skills and negotiation techniques should be offered to women running the kiosks. Training in risk assessment, projecting costs and revenues and developing a business plan is imperative to expand business.

- To attract customers and develop a loyal consumer base, adoption of standard pricing methods at local or regional levels is important to set up fair prices for the catches, ensuring profit stability and reduced skew of negotiating power. Developing online marketplaces for the women entrepreneurs without middlemen's interference, with a large consumer base and higher profits saves on logistics and storage.

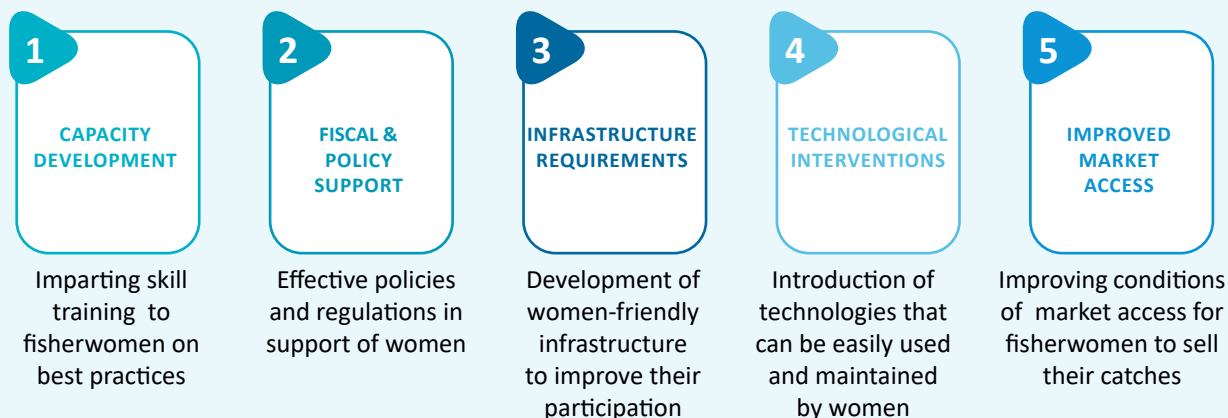
To encourage more entrepreneurs in the area of dairy farming and fisheries business, the National Institute for Entrepreneurship and Small Business Development has organized Entrepreneurship Development Programmes that offer training to equip the fisher communities with sufficient knowledge and help them set up their business.<sup>80</sup>

**Figure 11:** Entrepreneurship model for fish kiosks



<sup>80</sup> <https://niesbud.nic.in/docs/2020-21/online-training/EDP-on-Dairy-Farming-Fisheries-Business-18-july-2020.pdf>

**Figure 12:** Roadmap for enhancing women participation in fisheries



To enhance the overall participation of women in the sector, public-private sector partnerships, synergy between different industry bodies and a robust policy framework are required. Hence, five priority areas have been identified and actions against each area have been mapped so as to bring a meaningful change in this sector.

### Capacity Development

- Conducting skill development training programmes for women in various phases of the fisheries value chain and entrepreneurship opportunities is important.<sup>81</sup> This includes:
  - Appropriate technical assistance, training in fishing techniques, sustainable fishing



**CAPACITY DEVELOPMENT**

**Government Organizations:**

- Agricultural Skill Council of India (ASCI)
- Central Marine Fisheries Research Institute

**State Organizations:**

- Fishfed Odisha
- Karnataka State Women Development Corporation (KSWDC)

practices, value addition and processing activities, latest methods of post harvesting, etc., should be designed to target women;

- Training in less developed parts of the value chain can enhance meaningful engagement of women in the sector;
- Conduct training for fisherwomen to improve technical literacy (i.e., how to use digital finance services); and
- Providing leadership, entrepreneurship and skill-building training for women civil society members, women’s organizations, etc.

### Financing: Policies and Incentives

- Governmental support and public-private partnerships at the grassroot levels are essential to promote commercial viability in the unorganized segment of this sector. Effective and favourable policies and regulations to support women are important. This involves:
  - The credit policy needs to be revamped so that women can have access to facilities without collateral. For instance, the Matsyajibi

<sup>81</sup> FAO, 2016. *A Strategy for Sustainable Fisheries and Aquaculture in the Volta Basin Riparian Countries’ Post-Harvest Chains and Regional Trade.*



## FINANCING: POLICIES AND INCENTIVES

### Government Organizations:

- National Bank for Agriculture and Rural Development
- National Cooperatives Development Corporation

### State Organizations:

- Vrutti (Karnataka)

Unnayana Yojana extends financial assistance to fisherwomen's SHGs to manage issues pertaining to marketing and procurement;

- Short-, medium- and long-term loans should be offered to women fisher folk with lower interest rates;
- Special provisions must be made in legislation for women fisher folk in the lease of common property resources so that the lessees (women) can have the right of ownership over the property; and

- Framing of policies for women to specifically address issues of post-harvest loss, including prevention and recovery.

### Infrastructure and Services

- Setting up of infrastructure services that can easily be used and maintained by women is required to enhance their participation and reduce their workload.<sup>82</sup> This includes:
  - Setting up of childcare facilities for fisherwomen; and



## INFRASTRUCTURE & SERVICES

### Government Organizations:

- The Department of Animal Husbandry, Dairying, and Fisheries
- Department of Fisheries, Ministry of Agriculture and Farmers Welfare: Fisheries and Aquaculture Infrastructure Development Fund (FIDF)
- Marine Product Export Development Authority

- Identifying issues arising due to centralization of fish landings from sea to harbours for women engaged in post-harvest activities in small-scale fisheries, and provide support through:
  - safe public transport to harbours and markets
  - access to fish through state procurement agencies

adopted in the market, reducing time and efforts in fishing activities. This involves:

- Introduction of technologies that can be used and maintained easily by fisherwomen specifically with respect to handling, processing and transport of fish that increase fish's shelf-life is required;
- Adoption of modern tools of information technology for data communication and fish storage, improving the quality and timeliness of fisheries data; and
- Training programmes for women on how to use, maintain and repair technologies associated with the value chain ecosystem.<sup>83</sup>

### Technology Interventions

- Development of technologies for women is important to make them aware of the new methods

<sup>82</sup> Ibid.

<sup>83</sup> USAID, 2019. *Advancing Gender in The Environment: Gender In Fisheries- A Sea Of Opportunities*



## TECHNOLOGY INTERVENTIONS

### Government Organizations:

- Indian Agricultural Research Institute (IARI); similar to development of Agricultural Technology Information centre, a robust ICT system dealing with the concerns of small-scale fisheries can also be developed
- Central Institute of Fisheries Technology (CIFT)

## Improved Market Access

- Establishing a loyal customer base is important for fisherwomen to sell their catch. This is done by:
  - Ensuring access to secure, hygienic and regulated marketplaces; and
  - Introduction of mobile applications for women to identify fish species, refer customers, or to inform price-setting or directly sell their catch to customers:
    - Dailyfish is an ecommerce website that deals with online sales of seafood. The website is aimed at targeting consumers in major cities of South India that do not have easy access to fresh fish. Another target audience is tech-savvy people who order online products that get delivered to their homes<sup>84</sup>
    - Another start-up, Buyfish.in, launched in 2013, aims at providing online fish marketing services in Bengaluru. Orders can be placed on the app platform and products will be delivered at the doorstep. With a staff strength of 27 people, infrastructural facilities such as cold storage and processing centres, the start-up serves around 1,800 customers in the city<sup>85</sup>



## IMPROVED MARKET ACCESS

### Government Organizations:

- Indian Agricultural Research Institute
- Central Institute of Fisheries Technology (CIFT)

<sup>84</sup> <https://www.dailyfish.in/aboutus>

<sup>85</sup> <https://buyfish.in/>

5.



Annexures

## PEER REVIEWERS TO THE SECTORAL STUDIES

Sectoral Chapters	Peer Reviewer
Renewable Energy	Dr. Srinivas Shroff Nagesha Rao, <i>Chief Executive Officer, REC Foundation</i>
Green Construction	Suneel Padale, <i>Director Programs, CARE India</i>
Green Transport	Hitesh Vaidya, <i>Director, NIUA</i>
Water Management	Moho Chaturvedi, <i>Consultant Water Resources and Environment</i>
Carbon Sinks- Forests	Vishaish Uppal, <i>WWF India</i>
Carbon Sinks- Marine Fisheries	Ramya Rajagopalan, <i>Independent Researcher</i>

## STAKEHOLDER INTERACTION

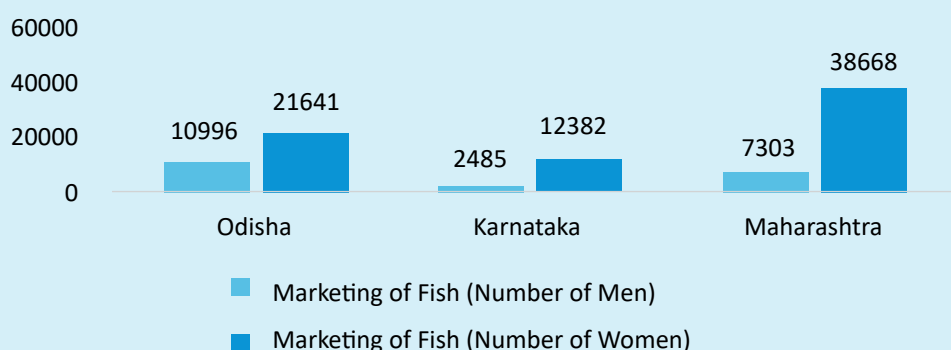
Sr. No.	Name	Expert/ organization	Designation
1	Dr. Nikita Gopal	CIFT, Kochi	Principal Scientist
2	Dr. Venkatesh Salagram	FAO	Independent Consultant and International Consultant with the FAO
3	Dr. Senthil Vel	College of Fisheries, Mangalore	Dean
4	Dr. Anupam Sarkar	ASCI	Researcher

## ADDITIONAL INFORMATION AVAILABLE ON THE SECTOR

According to an analysis based on marine fisheries census 2010, 75 percent of the total fisher population engaged in fish marketing activities is women. Figures A1 to A6 provide graphical representations depicting the

participation of men and women in fishing and allied fishing activities in the three states considered under this study, namely, Karnataka, Maharashtra and Odisha.

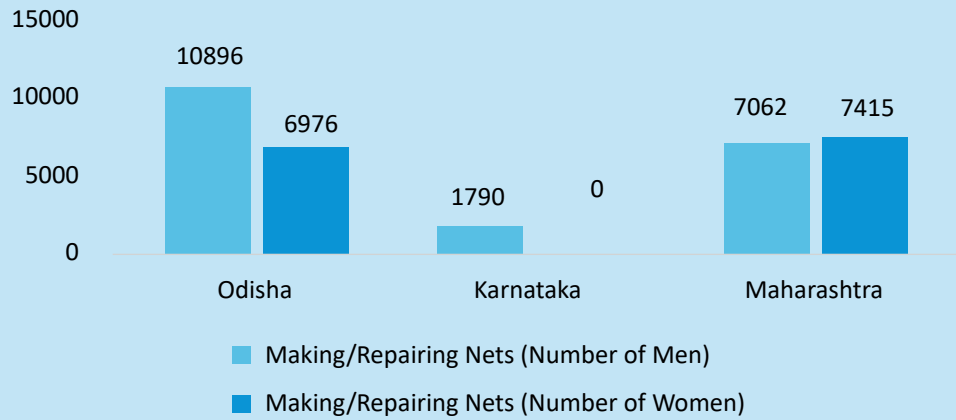
**Figure A1:** State-wise depiction of men and women engaged in marketing activities<sup>86</sup>



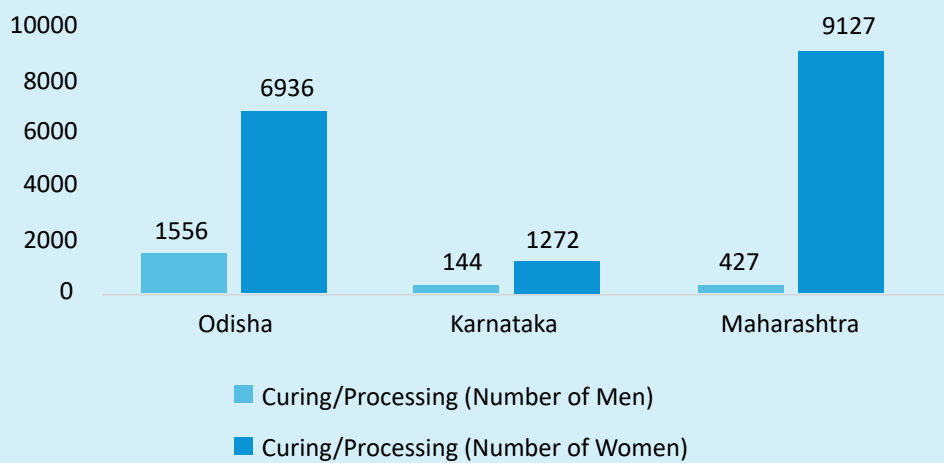
<sup>86</sup> CMFRI. Marine Fisheries Census, 2010.



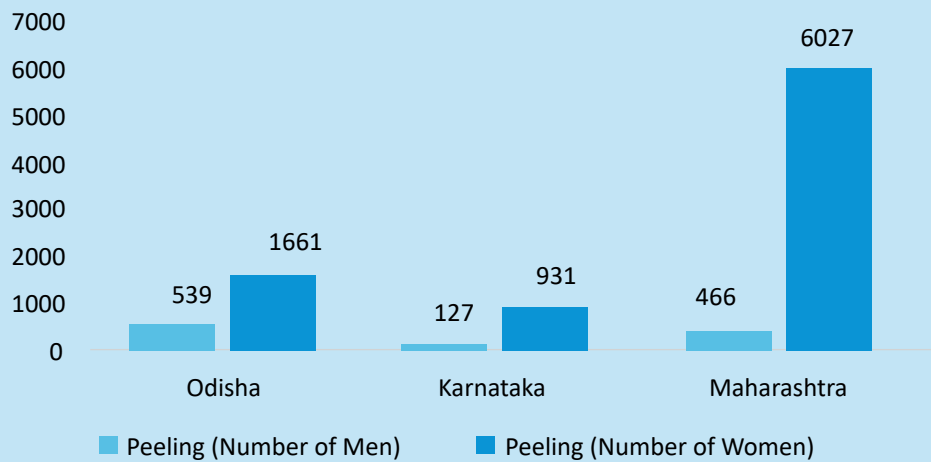
**Figure A2:** State-wise depiction of men and women engaged in making/repairing nets<sup>87</sup>



**Figure A3:** State-wise depiction of men and women engaged in curing/processing activities<sup>88</sup>



**Figure A4:** State-wise depiction of men and women engaged in peeling activities<sup>89</sup>

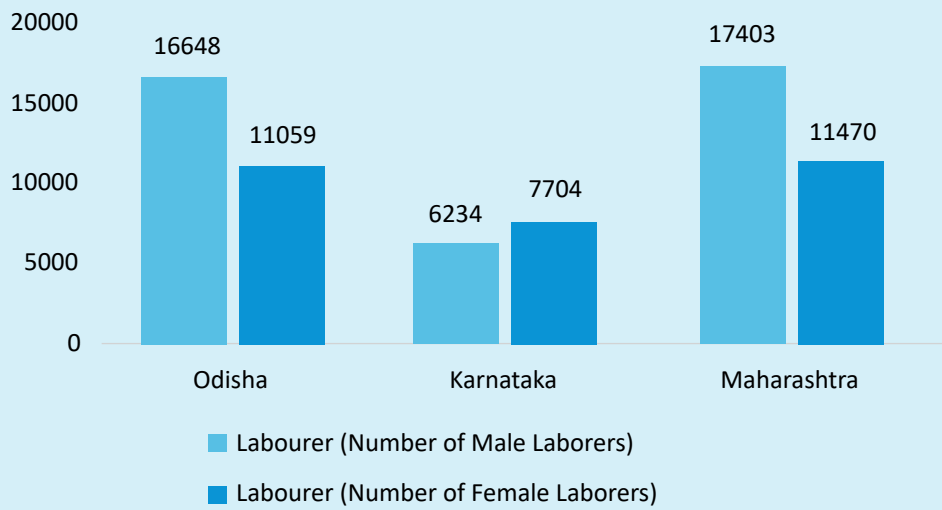


<sup>87</sup> Ibid.

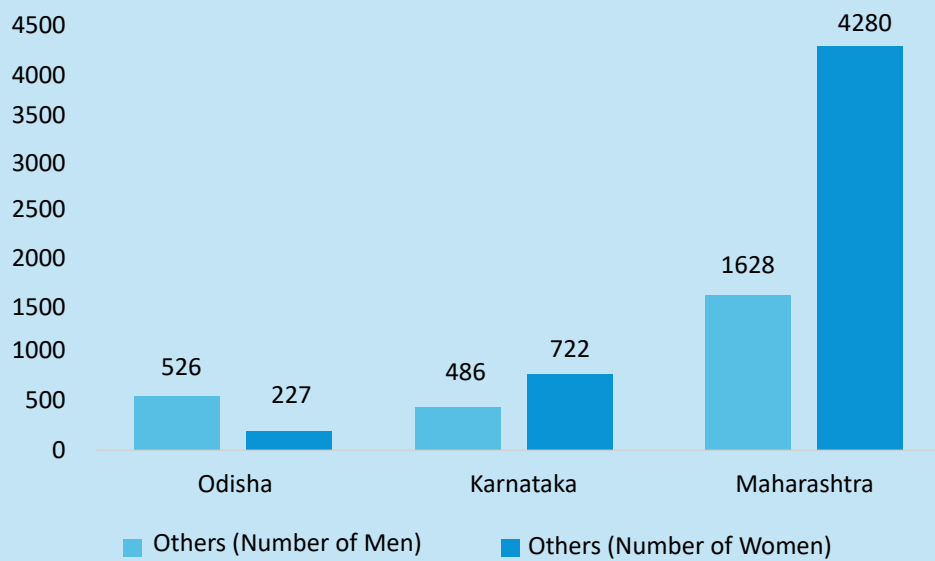
<sup>88</sup> CMFRI. Marine Fisheries Census, 2010.

<sup>89</sup> Ibid.

**Figure A5:** State-wise depiction of male and female labourers engaged in allied fishing activities<sup>90</sup>



**Figure A6:** State-wise depiction of men and women engaged in other fishing activities<sup>91</sup>



<sup>90</sup> Ibid.

<sup>91</sup> Ibid.

## JOB ROLES AND QUALIFICATION PACKS (QPS)

Job Roles with existing QPs	Job Roles with no existing QPs
<ul style="list-style-type: none"> <li>- Fisheries extension associate</li> <li>- Aquaculture fabricator</li> <li>- Aquaculture technician</li> <li>- Aquaculture worker</li> <li>- Fish retailer</li> <li>- Fishing boat deckhand</li> <li>- Fishing boat driver</li> <li>- Fishing boat maintenance worker</li> <li>- Fishing boat mechanic</li> <li>- Fishing equipment technician (electronics)</li> <li>- Fishing gear technician</li> <li>- Hatchery production worker</li> <li>- Mariculture operator</li> <li>- Marine capture fisherman</li> <li>- Ornamental fish technician</li> <li>- Shrimp farmer</li> </ul>	<ul style="list-style-type: none"> <li>- Quality control personnel</li> <li>- Net makers and menders</li> <li>- Deep sea fisher</li> <li>- Fish waste segregator</li> <li>- Fish meal processor</li> </ul>

In order to enhance women participation in the marine fisheries sector socio-economic-policy support structures and measures needs to be strengthened. There is a need to facilitate women's access to

credit and finance; and also to the markets local and otherwise. The approach to the marine fisheries and aquaculture needs to be holistic covering all primary production and allied sectors.









**Disclaimer:**

Due to COVID-19 pandemic and the travel restrictions, the report is purely based on secondary sources and information obtained by KPMG from organisations, experts and through stakeholder interactions. This report sets forth information based on the completeness and accuracy of the facts stated and any assumptions. The comments in the report are not intended, nor should they be interpreted to be legal advice or opinion.



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