

Participant Handbook

Sector
Agriculture and Allied

Sub-Sector
Fisheries

Occupation
Assistance (Fisheries)

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NSQF Level 3



**Fisheries Extension
Associate**

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Shri Narendra Modi
Prime Minister of India

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If we have to move India towards
development then Skill Development
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AGRICULTURE SKILL COUNCIL OF INDIA

for

SKILLING CONTENT: PARTICIPANT HANDBOOK

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It is expected that this publication would meet the complete requirements of QP/NOS based training delivery, we welcome the suggestions from users, Industry experts and other stakeholders for any improvement in future.

About this book

This book is a comprehensive information and skilling guide to those who intend to provide the extension services to the fishers in the local area by playing role of Fishery Extension Associate. A Fisheries Extension Associate (FEA) is responsible for mobilizing members of the fishing community for extension training and other activities at community level. He/She provides assistance in ensuring active community participation, identifying target group for the training and other community level activities.

The FEA would work with scientific information communicated by the Fisheries Extension Officer to perform the activities in a coherent manner and highly coordinated to give greater impact of the extension programmes planned. He/she should know the community, their culture, fisheries resources, different fishing methods/practices and very specifically the economic status of the community with whom works have to be carried out. This book will help in gaining appropriate knowledge and skills by meeting the following criteria:

- **Knowledge and Understanding:** Adequate operational knowledge and understanding to perform the required task
- **Performance Criteria:** Gain the required skills through hands on training and perform the required operations within the specified standards
- **Professional Skills:** Ability to make operational decisions pertaining to the area of work.

This handbook has been designed for the Fisheries Extension Associate to work on assisting the Fisheries Extension Officer on need assessment, basics in planning, implementation and evaluation of extension programmes, using appropriate extension methods and mobilizing fishers/fish farmer with a highest level of participation.

Symbols Used



Key Learning
Outcomes



Steps



Time



Tips



Notes



Unit
Objectives



Exercise

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1. Introduction

- Unit 1.1 - Fisheries extension education
- Unit 1.2 - Operating environment in fisheries
- Unit 1.3 - Fishing methods
- Unit 1.4 - Role of fisheries extension associate
- Unit 1.5 - Understanding extension organisation



Key Learning Outcomes

At the end of this module, you will be able to:

1. Explain the concept of education, extension education and fisheries extension education
2. Discuss about the fisheries resources in India
3. Recognise the life of fishers and fish farmers and their daily routine
4. Explain role of extension organisation
5. Analyse the role of fisheries extension associate
6. Compare different fishing practices

UNIT 1.1: Fisheries Extension Education

Unit Objectives

At the end of this unit, you will be able to:

1. Explain the concept of education, extension education and fisheries extension education

1.1.1 What is Education?

Education is meant for bringing advantageous change into the behavior of human beings. In simple words it means that change in knowledge, skill and attitude of human being. Sociologist Rodney Stark declares that, “education is the cheapest, speedy, and most trustworthy way to improve socio economic conditions of human beings”

How do we classify education?

- **There are three types of education:** Formal, non formal and informal
- **Formal education:** In formal education the subject is uniform and the participants are homogenous, it is a full time activity which leads to provide degrees. Examples are schools, colleges etc.
- **Non formal education:** In non formal education the process is outside which is not a formal system like the schools and colleges as discussed above in the formal education. Participants may be heterogeneous
- **Informal Education:** In Informal education system in which individuals every individuals acquire information, knowledge and skill through day to day experience

1.1.2 What is Extension Education?

Extension Education is all about providing information and knowledge that are practically useful for rural people to provide solutions for problems that face every day in farming and related practices. Extension education is an applied science consisting of subject matter derived from research findings and using principles of behavioural sciences. The system of education is aerated with appropriate technology embodied with philosophy, principles and methods which are out of school education for youth and adults.

In simple extension education is a non formal education meant for providing improvement in livelihood through information, knowledge and skill

1.1.3 What is Fisheries Extension Education?

As the fisheries resources are abundant fishers/fishermen used to exploit the resources in different manner. Over the years there have been many research and development activities by which innovations i.e new ideas and technologies have emerged. These innovations and technologies have to reach the fishers/fishermen for better production and sustainability. Fisheries extension fills this

The prime objective of marine fisheries/aquaculture extension is to convince and help fishers, fishermen and related stakeholders to stay back with good socioeconomic condition and to improve quality of life using better farming practices resulting in increased fish production and income.

In India and in most of the South East Asian countries the state-sponsored fisheries extension services are the major players among fisheries extension services.

In simple terms, one can understand that fisheries extension services supports the fishers/fishermen towards understanding and adopting new/improved practices for higher production and productivity.

The four paradigms of Fisheries Extension to which it caters are as follows:

- Technology Transfer- transferring innovations/technologies to fishers and fish farmers
- Advisory- providing information on different aspects of farming/diagnostic services/other information etc
- Human Resource Development- Providing information, knowledge and skill
- Facilitation for Empowerment- facilitating changes in farming and attitude towards improvement farming practices

To conclude

The major purpose of aquaculture/fisheries extension is to influence/convince the fishing communities to get better with socioeconomic condition and have a quality life by adopting better farming practices through enhanced fish production.

Do you know?

- India is 3rd in fisheries and 2nd in aquaculture production in the world
- Indian marine fish stock is depleting over the years
- Contribution of marine fisheries is 35.93% and 66.81% is from aquaculture to fisheries in India
- The existing per capita availability of fish is 6.5 kg and is likely to touch 9.0 kg by 2030
- In India, where fish consumption is less but production is very high
- Andhra Pradesh is the largest producer of fish in India

Exercise

1. Discuss how education can bring change.

Ans: _____

2. Discuss how do you differentiate between education and extension education.

Ans: _____

Notes



A large rectangular area with a thin orange border, containing 30 horizontal lines for writing notes.

UNIT 1.2: Operating Environment in Fisheries

Unit Objectives

At the end of this unit, you will be able to:

1. Explain concept of livelihood
2. Identify fisheries resources of India
3. Recognise life of the fishers/fish farmers

1.2.1 What is a livelihood?

Livelihood can be understood as all human beings have capability to exploit the resources through any activity for earning income to lead a life. Hence, livelihood can be summarised as

Livelihood= Capability +Assets +Activity

How do you connect natural resources and livelihood?

- Land and water are the basic natural resources for human life. A human being who exploits or uses the natural resources are called as “Natural Resource Users”. Through any activity these resources are used for earning income to lead a life.

1.2.2 Fisheries Resources In India

Fish is a resource and any activity that is related to production of harvesting of fish from water bodies and culture is called fisheries.

According to the National Fisheries Development Board

- The Indian fisheries sector comprising the marine and inland (aquaculture) is an provides nutritional security to millions of human being and livelihood which contributes to the agricultural exports and involving 14 million people in varied activities.
- The different resources of Indian fisheries are as below:

Marine fisheries

The industry that is related to catching fish, selling fish and processing fish from the sea is called as marine fisheries. In India the marine fisheries is an activity all along coastline of 8129 kms.



Fig 1.2.2.1 Marine fishing

Aquaculture

Aquaculture can be understood as an activity of culturing/growing aquatic organisms/animals. It is performed for producing food. In India, the aquaculture resources are freshwater bodies like tanks, ponds, rivers, canals etc.



Fig 1.2.2.2 Small scale aquaculture photo credit: KVK-Khordha, ICAR-CIFA

Brackish water Aquaculture

Brackish water aquaculture are resources that possess salt more compared to freshwater, but not as much as seawater. Brackish water is by integration of seawater and fresh water.

Reservoir fisheries

Fishing activity in reservoir fisheries is called as reservoir fisheries. Reservoir fisheries is classified by the possession of water area and based on the water holding capacity. They are classified into

- Large (above 5000 hectares)
- Medium (between 1001 - 5000 hectare)
- Small reservoir (below 1000 hectare).

Riverine Fisheries

Fishing activity performed in the rivers is called as riverine fisheries. Fishes in the river is harvested by fish farmers for their livelihood.

Table 1.2.1 Some facts of Indian fisheries

Indian Fisheries	
Global position	Third position in World Fisheries Second position in World Aquaculture
The contribution of both marine and aquaculture sector to GDP in India by %	1.07 %
The contribution towards Agriculture sector in India to GDP by %	5.15 %
Estimated Indian per capita fish availability	9.0 kg
Income though exports/annum with Indian fisheries	33,441.61 Crores
The sector employs people for livelihood	14.0 million
Resources	
Coastline	8129 kms
Exclusive Economic Zone	2.02 million sq. km
Continental Shelf	0.506 million sq. km
Rivers and Canals	1,91,024 km
Reservoirs	3.15 million ha
Ponds and Tanks	2.35 million ha
Oxbow lakes	1.3 million ha
Brackish waters	1.24 million ha
Estuaries	0.29 million ha
Some Facts	
Present fish Production	6.4 mmt
Inland	3.4 mmt
Marine	3.0 mmt
Potential fish production	8.4 mmt
Fish seed production	21,000 million fry
Hatcheries	1,070
Number of Fish Farmers Development Agency called as FFDA	422
Number of Brackish water Fish farmers Development Agency called as BFFDA	39

1.2.3 Life of Fishers/Fish Farmers

The routines of fishers/fishermen

Like every human being the life of fishers/fish farmers are tailored with their activity. Fishers sail to sea for catching fish individually or in groups. The time of their activity depends upon the region, the weather condition and other factors. Some fishers start their fishing activity late in the night or early in the morning. They also depend on the availability of shoals. Fish farmers who culture fishes in freshwater resources and brackish water areas and have a daily routine of maintaining the ponds, fertilizing, feeding and other related activities related to the culture of fish.

Socio-economic Conditions of Fishers/fishermen

Records from different sources inform us that about 61% of the fishing communities in the marine sector belong to the category of below poverty line (BPL). Roughly 38% of the marine fishing community who are involved in active fishing and among them 85% are fully engaged in fishing activities. About 63.6% of fishermen are involved in fishing and allied activities. About 57% of the fishermen are involved in collecting fish seeds, 43% are females and 57% are males. Most of the marine fishermen are Hindus (76%), Christians (15%) and 9% are Muslims.

- The fishermen of India live under very poor socio-economic conditions
- The fishermen have a low educational status and reside in very poor conditions
- They live in the congested areas which are crowded without proper sanitation facilities that lead to health issues.
- Due to the low income of the family, the fishermen don't have appropriate and required basic facilities
- The large family size of fishermen is large and they are compelled to borrow money from different sources to satisfy their needs
- The family size of fishing communities across sectors like marine and inland ranges from 3.70 to 4.56
- A study indicated that about 46.76% of households of the fishing community fall under a family size of two to four members, followed by 38.99% having five to six members. Lastly, the study concluded that about 13.12% of the households were large, maintained with seven to ten family members (Salim, 2013).
- It is also understood that the literacy rate of the fishing communities is estimated to be 79.96% of which in inland fisheries it is 71.22% and in mariculture it was found to be 95.44%.

A study revealed that across sectors, monthly income was the highest in marine capture (Rs. 8742), followed by brackishwater aquaculture (Rs. 7505), marketing and processing (Rs. 7027), mariculture (Rs. 6809), fresh water aquaculture (Rs. 6166) and inland capture (Rs. 2727) with an average of Rs. 6496 per month (Salim, 2013).



Fig 1.2.3.3 A typical marine fishing village

Exercise

1. Why livelihood is important for a human being and discuss what are the components of livelihood?

Ans: _____

2. Discuss the fisheries resources of India.

Ans: _____

3. How far is Indian fisheries contributing to India.

Ans: _____

4. Can you differentia the life and routine of fishers and fish farmers? If yes, discuss

Ans: _____

5. How do you conclude the socio-economic status of fishers/fishermen?

Ans: _____

Notes

UNIT 1.3: Fishing Methods

Unit Objectives

At the end of this unit, you will be able to:

1. Compare different fishing methods practiced with different resources
2. Implement the package of practices followed in aquaculture
3. Recognise the value chain in aquaculture

1.3.1 Fishing Methods

Crafts (boats) and gears (nets) are the two important fishing equipments that are prevalent in marine fisheries. The fishers use different type of boats like catamaran (traditional fishermen), motorised boats (motorised fishermen) and mechanised (deep sea fishing with advanced equipments).

- There are five major Gears – Trawl – Bagnets – Gillnets – Seines – Hook and Line



Fig 1.3.1 Catamaran (traditional boat)



Fig 1.3.2 Motorised boats with Out Board Engine (OBM)



Fig 1.3.3 Trawler boats

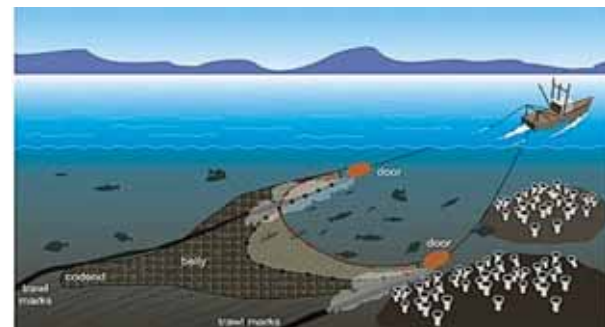


Fig 1.3.4 Gill net

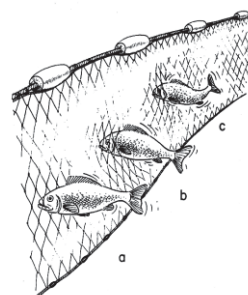


Fig 1.3.5 Trawl net

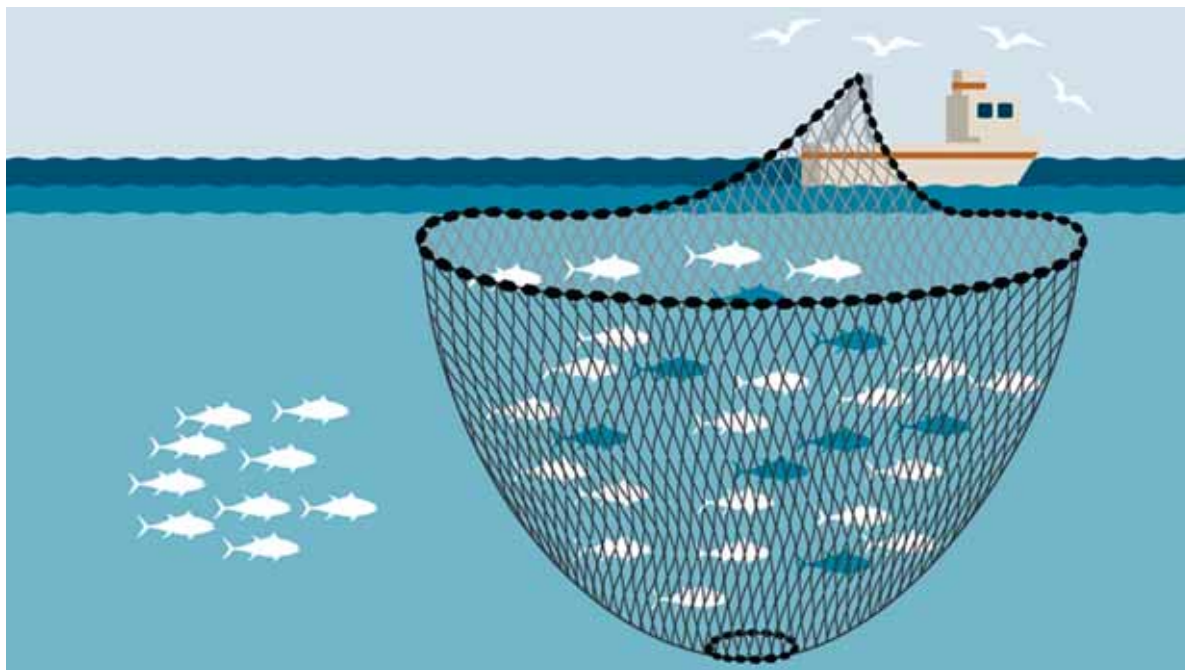


Fig 1.3.6 Purse seine

- Aquaculture is practiced in two ways one in freshwater and other one in brackish water. In freshwater aquaculture, breeding of freshwater fishes is undertaken. The major fishes cultured are under the Indian Major carps (IMC). IMC includes fishes like catla, rohu and mrigal. Apart from these, minor carps, magur, prawns and ornamental fishes
- Brackish water aquaculture involves breeding of fishes like sea bass, grey mullet, tiger shrimp and mud crabs are cultured. Brackish water aquaculture is widely practiced in the states of Tamilnadu, Kerala, Andhra Pradesh, West bengal and in few other states.
- To feed the fish mixing oil cakes, rice bran, locally available resources are used
- Aquaculture is practiced in individual ponds and community ponds.
- In India most of the community ponds are public resources like temple tanks, ponds under Gram Panchayat commonly called as GP tanks etc.

Practices in Aquaculture

Pond construction

The most important infrastructure required for aquaculture is pond. The design of the fish pond is determined on the fish species desired for cultivation. Landscape of the area in which the pond is likely to be constructed depends on the number and sizes of ponds in relation to the water sources.

Fish seeds

- Fish seeds are produced by fish hatcheries owned by government and private sectors.
- The fish seeds are of three types viz., spawn, fry and fingerling.
- The common practiced stocking density for Catla, mrigal and rohu is 8000 fingerlings/ha.



Fig 1.3.7 A typical fish pond



Fig 1.3.8 A typical carp fish hatchery
Photo credit: KVK-Khordha, ICAR-CIFA



Fig 1.3.9 Spawn



Fig 1.3.10 Fry



Fig 1.3.11 Fingerlings

Quality of Fish Seeds

The quality of seeds determines better production. It is a fact that quality does not just refer to the genetic composition of the fish. But it refers to general health, relative size and other characteristics of the fish like phenotype and physiological.

Feeding

- In general fish farmers feed fish using groundnut oil cake and rice bran in a rate of about 6% of the biomass (body weight) in the first month and 4% of the biomass in the second month. In subsequent months feeding is restricted to 2-1%.
- raw cow dung as an organic fertilizer is used for fertilizing the pond with inorganic fertilizers like urea and single super phosphate for better plankton production
- (Handbook on Fisheries Statistics, 2014)

Water Quality

- Farmers have to maintain the water quality as it will be crucial to control fish disease and performance in aquaculture.
- The range of water quality to be maintained depends upon the species cultured. The parameters are varied like the temperature, the available concentration of oxygen, pH, the level of salinity, the hardness of water, etc by the fishes can be grown and cultured
- The pond water may be acidic, alkaline or neutral.
- One needs to understand that the pH value of water is ranged from 0 to 14. The water that has pH 7 is considered to be neutral. If the value is found to be less than 7 it can be decided as it is acidity. By the way if the value is more than 7 confirm it is as alkaline.
- You need to understand that the production of fish will be highly affected by in excessive low or high pH. How to keep soil pH at the right level?

It is recommended to

- Dry the pond for at least two weeks after each harvest before the next production activity
- Liming the pond after each harvest.
- One has to understand that liming can be done administering in bottom of the pond before it water is pumped in. However, if required, lime can be applied to the water surface upon filling the pond.
- The quantity of lime and the method to be adopted should be based on the recommendations of the extension workers

Fish Health Management

It is an accepted fact that the fish health can be successfully managed with prevention of disease not to think about the treatment.

- Maintaining a good water quality, with adequate nutrition and good sanitation can prevent from diseases and the pond can be managed properly
- Without taking care of these it is impossible to prevent outbreaks of diseases.
- Infectious and non-infectious diseases are the two types of fish diseases.
- Infectious diseases are due to pathogenic organisms present from the environment or carried and transmitted through other fish. You can conclude that they are contagious and treatments are required to control it
- The non-infectious diseases are due to problems from the environment, inadequate nutrition, or genetic reasons and are not contagious and will not be possible to be cured by treatments.

Aquaculture Value Chain

Value chain is a series of activities or transactions needed to make a product and deliver it to the customer.

Activity 1: Hatchery

Fish seed production and upon production of seeds it is distributed to the customers

Activity 2: Fish Feed Manufacture

Fish feed constitutes 60 percent of the production cost in fish culture. Most common fish feed in India is produced using plant derived materials like rice bran, mahua oil cake, soyabean etc. Apart from that fish feeds are commercially produced which is also sold to customers. Manufacturing fish feed Commercial fish farming uses the pellet feeds manufactured by government or other agencies. Mostly small scale fish farmers produce the feed by themselves.

Activity 3: Nursing

Fish seeds like spawn are reared to make it as fry and then fingerling. Fish seed rearing is also viable business and mostly done by fish hatcheries.

Activity 4: Raising Fish

Fish are raised in ponds on a mixture of large, medium and small farms.

Activity 5: Logistics

Fish seeds and growout fishes are transported to longer distances using different transport means. Fish seeds produced in West Bengal is transported to Andhra Pradesh through trains, shorter distant places mini trucks and other transport means are used.

Activity 6: Marketing

Local markets are the major places for the fish farmers to sell their products. Compared to the achievements in fish production, the fish marketing system is very poor and highly inefficient in India (Ganesh Kumar et al., 2008).

Activity 7: Consumers

Vast majority of the aquaculture production is consumed by the domestic market, products such as shrimps are almost exclusively produced for the export market (80%).

Exercise

1. Can you describe any two important fishing equipments in marine fishing?

Ans: _____

2. Discuss about the type of fishes cultured in freshwater of India.

Ans: _____

3. Discuss about the type of fishes cultured in brackishwater in India.

Ans: _____

4. Discuss about how fish seeds are produced in India.

Ans: _____

5. Discuss how to maintain the water quality in ponds.

Ans: _____

Notes



UNIT 1.4: Role of Fisheries Extension Associate

Unit Objectives

At the end of this unit, you will be able to:

1. Explain status of fisheries extension in India
2. Recognise role of a fisheries extension associate

1.4.1 Role of Fisheries Extension Associate

Fisheries extension is considered as the weakest link to fisheries development in India. The foremost reason for it is because the high ratio of extension worker to fishers/fishermen. It is simple to understand that one fisheries extension worker has to work for many fishers/fish farmers. To cater extension services for the fishers and fish farmers, there should be additional manpower or otherwise to support the existing extension worker with para technicians like a fisheries extension associate.

A fisheries extension associate supports the fisheries extension worker to execute the extension programmes as per mandated in an organisation.

The specific roles to be performed by the fisheries extension worker will be on

- Assist in planning, organizing, conducting, evaluating and following up of training, demonstration/trial and implementation of development programmes
- To collect primary and secondary data for the extension programmes
- Assist in need assessment for extension programmes
- Facilitate in using participatory approaches for implementing extension programmes
- To understand participation level of community and to how to participation of fishers to fullest level i.e maximum in extension programmes
- To use extension methods based on the needs
- List the type of education
- How will you differentiate formal and non formal education
- What are the four paradigms of extension
- Explain the fisheries resources in India?
- What is fisheries extension.



Fig 1.4.1 Fisheries Extension Officer explaining about the water quality of a pond

Exercise

1. Discuss areas of work of the fisheries extension?

Ans: _____

Notes

UNIT 1.5: Understanding Extension Organisation

Unit Objectives

At the end of this unit, you will be able to:

1. Understand about extension organisation
2. Identify the extension organisations in India at different levels
3. Use guidelines and regulations in fisheries

1.5.1 What is an Extension Organization?

Organization and management will be key development in any sector and in fisheries also. An extension organization in fisheries works for the fishers/fishermen. They provide different type of services like advisory services, demonstration of improved practices, creates awareness about the development schemes available and many others.

1.5.2 Extension Organizations in Fisheries

National Level

- The Department of Animal Husbandry Dairying and Fisheries (DADF) is the upper level organisation. It works as one of the department under the Ministry of Agriculture and Farmers Welfare, Government of India. The Fisheries Division works as one of the Divisions of this Ministry.
- The above department advises the state governments in the plan and put forwarding policies and programmes in dairy, poultry, marine and aquaculture. The major works carried out are towards a
- Developing required infrastructure for improving productivity in states of India
- Works on the preserving and protecting livestock through provision of health care and other means
- Strengthening of livestock farms funded by the central government in developing better and superior strains to states
- The other works are related to expanding Aquaculture and providing better facilities and welfare measures for the
- Specialized Board for fisheries at the national level is National Fisheries Development Board (NFDB) like Tea/Coffee/Spices Board and Coconut Board etc
- Established in 2006 an organization under the administrative control of the Ministry of agriculture, Government of India. The board has been established to augment fish production in India and to coordinate fishery development
- Using the state government the NFDB funds performs its activities

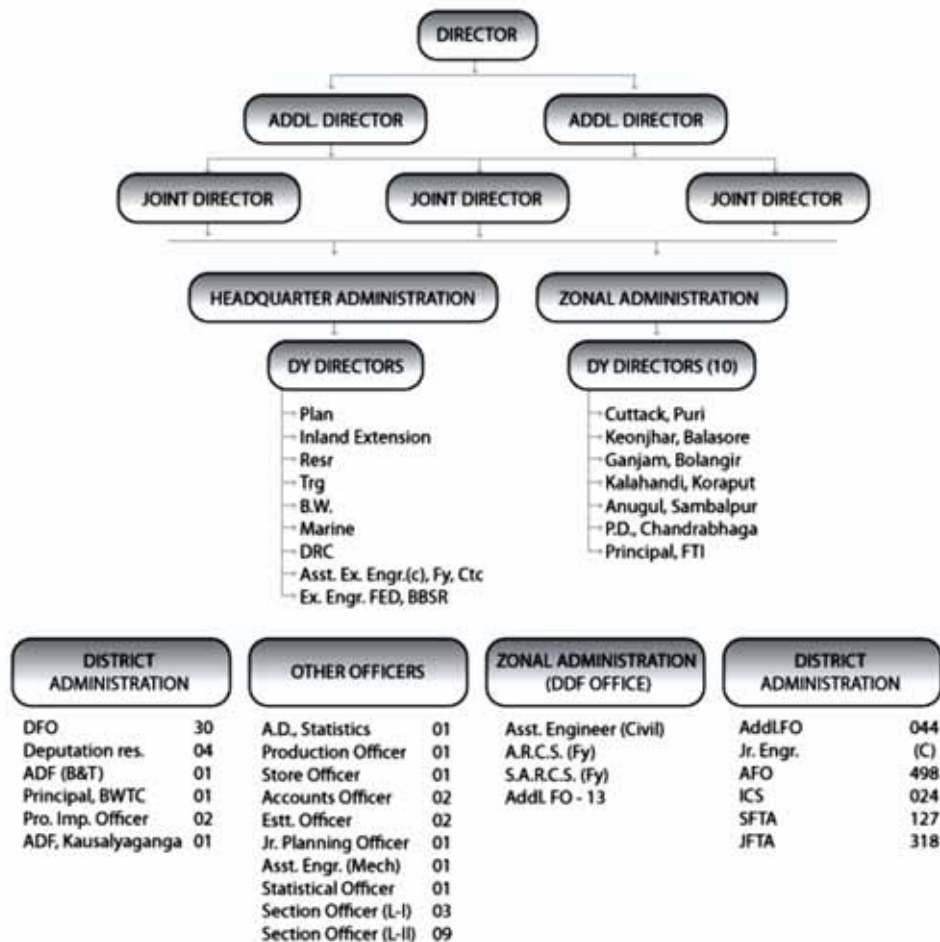
Nine states

- Gujarat
- Maharashtra
- Goa
- Karnataka
- Kerala
- Tamil Nadu
- Andhra Pradesh
- Odisha
- West Bengal

Four Union Territories

- Daman & Diu
- Puducherry
- Andaman and Nicobar Islands (Bay of Bengal)
- Lakshadweep Islands (Arabian Sea)

Those states (landlocked) which are not maritime they have well structured departments for aquaculture, brackish water and other resources for development to perform development activities. A typical state fisheries department dedicated for extension will be as follows:



Source: Directorate of Fisheries, Govt. of Odisha

What does a fisheries extension organization deliver to fishers?

The general activities of a fisheries extension organisation are towards bringing changes through development interventions. State and Central development welfare schemes are also implemented by the state extension machinery. For example the West Bengal government fisheries department is taken as an example.

Inland Fisheries

- Distribution of fingerlings through the fish seed hatcheries and farms
- Fish feed distribution
- Development of Small Fish Market
- Construction of fish hatcheries and portable hatchery
- Developing of fisheries in reservoirs
- Working on the development of lab facilities for conducting research on aquaculture
- Distribution of nets and other accessories
- Developing brackish water fisheries
- Developing infrastructure facilities for fishing villages
- Developing cold storage systems.

Marine Fisheries

- Works related to enhancing marine fish production by providing appropriate infrastructure and also facilitate for value addition in the post harvest phases
- Developing marine fishing village with appropriate infrastructure and basic facilities
- Developing fish feed plans with techniques involving preservation and also for marketing
- For providing safety measures the department works on providing Wireless Communication for marine fishermen
- Developing fishing harbour and fish landing centres

Other Programmes

- Capacity building of fishing communities and the unemployed
- Subsidy for fishermen's co-operative societies
- Electrifying fishing villages using alternate energy sources.
- Providing accident insurance in individual or group basis
- Works to develop a model fishing village
- Strengthening technology transfer unit i.e extension department with extension services like literature and information sharing
- Conducting studies on ecological and environment in relation aquaculture
- Works on using the fish farms for conducting adaptive trails for validation of new technologies for quality fish seed production in state owned fish seed rearing farms
- Support in creating database and developing Geographical Information System (GIS)

Fish Farmers Development Agency (FFDA)

- The main aim of FFDA is to mainly facilitate adoption of modern practices in inland aquaculture through institutional finance and training.
- The funding of FFDA to states is by the central government and state government for construction of new ponds, first year input, integrated farming with horticulture crops, prawn, piggery and other possible integrations and also for the purchase of aerators and pumps.

- At present there are 422 FFDA and 39 brackish water Fish Farmers Development Agency (BFFDA) in India operated at the district level. (Source: Fisheries & Animal Resources Development, Govt. of Odisha)

1.5.3 Guidelines and Regulations in Fisheries

Fisheries is a state subject in India. Development of fisheries is vested with the concerned states of India. Hence, the regulations differ from state to state. However, Indian constitution favours a political structure in which power and the responsibilities are appropriately divided among the state and union government for certain laws related to fisheries. Therefore, there are various key legislations under state government which deal with the regulation of fisheries and related sectors.

- Fisheries in the coastal states of India (it is also called maritime state), within the territorial limits of 12 miles, are dealt with under the Marine Fishing Regulation Act (MFRA).
- In absence of a comprehensive national fisheries policy the state Kerala was the first state to draft a fisheries policy in India and after that many states have followed to draft policies.
- Fisheries policy has been drafted by some states of India that drives and guides for the development of fisheries of the concerned state.

Coastal Aquaculture Authority of India

Brackish water aquaculture is also called as coastal aquaculture.

- The Coastal Aquaculture Authority (CAA) was established with the Coastal Aquaculture Authority Act, 2005.
- Brackish water aquaculture produces mainly high values species of fish and prawns.
- There are many who are attracted to invest and they misuse the resources creating pollution and other illegal activities.
- The major purpose on the establishment of CAA is to control coastal aquaculture activities in coastal states of India for sustainable development and to protect the coastal environment.
- CAA is authorized to develop regulations for the development of coastal aquaculture construction in terms of operation of farms. They also inspect farms using the environmental impact techniques, registration, fixing standards for inputs and effluents and related aspects that can damage the coastal environment.

In April 2017, Government of India has notified the 'National Policy on Marine Fisheries, 2017' (NPMF), which provides guidance for promoting 'Blue Growth Initiative' which focus on ushering 'Blue Revolution' (NeeliKranti) by sustainable utilization of fisheries wealth from the marine and other aquatic resources of the country for improving the lives and livelihoods of fishermen and their families.

Each and every state of India has a fisheries policy and guidelines for using the resources are dealt in detail for the fishers/fishermen to adhere.

Exercise

1. Can you discuss the importance and role of an extension organization.

Ans: _____

2. Discuss what are the extension agencies in fisheries working at different levels.

Ans: _____

3. Discuss what are roles of the extension organizations in fisheries at different levels.

Ans: _____

4. What is Marine Fishing Regulation Act?

Ans: _____

5. What is the other name of brackishwater aquaculture?

Ans: _____

6. Discuss about the fisheries policies of India.

Ans: _____

Notes



A large rectangular area with a thin orange border, containing 30 horizontal lines for writing notes.

