

FINAL DRAFT After Corrections

Government of Kerala

The State Fisheries Policy 2019

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Preface

The fisheries sector plays an important role in the economy of Kerala. The State is blessed with geographical uniqueness as well as diverse aquatic ecosystems. It has a coast line of 590 km length, a continental shelf of 39139 sq. km, an exclusive fishing area of 218,536 sq. km, 53 backwater lakes, 44 rivers and extensive watersheds areas.

Fish is a food commodity rich in proteins and many essential nutrients. Providing about 70-75 % of animal protein, fish plays a major role in the nutrient security of the people of Kerala. According to the National Consumer Survey Report, fish intake is 829 and 812 families out of 1000 survey families each in rural and urban areas of the State respectively. This clearly shows that the sustainable development of the fisheries sector is a pre requisite for the well-being of the people of the State.

Traditionally and historically, Kerala is a fish producing and consuming State. For a long time it stood first in the total production of sea food among the maritime states of India. Off late, it has been pushed to the fourth position well behind West Bengal, Andhra Pradesh and Gujarat. Nevertheless, the state has witnessed considerable progress in aquaculture production during the last many decades. Fishing provides livelihood security to 10.29 lakh of the coastal inhabitants who live in 222 coastal fishing villages and 113 inland fishing villages. Out of the total population 3.08 % depend on the fisheries sector of Kerala for employment. The State has a population of 1.86 lakh active fishers working directly in the fisheries sector. Another 1.64 lakh depend on the allied sectors like fish processing, marketing and distribution. There are 749 fisher cooperatives functioning in the State.

Mechanised fishing as well as modernisation in the fish processing sector has made the fisheries sector of the State to emerge as an export oriented industry. During 2016-17, the State has earned Rs 5008.54 crores from the export of 1591.41 tons of seafood to 90 countries. The sector contributes Rs. 7086.32 crores to the total GDP of the State. This amounts to 1.36% of the domestic production (at constant price) and 11.39% of the primary sector production front.

Our Limitations/constraints

Though the sector has gained considerable progress through mechanisation/modernisation, the per capita production of the traditional fisher is hardly 1500 kg/year. The decline in fishery resource emanated by unregulated fishing has significantly reduced the per capita income, thus marginalising the fishers from the mainstream developmental activities of the State. A number of factors decide the socio economic well- being of fisherfolk. This includes fish abundance, beach level price, number of fishing days and cost of fuel. Hardly 20 % of the fisherfolk of the State has ownership over the means of production. Others are solely dependent on those who own fishing equipment like crafts and gears. So, future interventions should aim not only resource augmentation but also ensuring ownership over means of production to the traditional fishers of the State.

The globalisation policy being adopted by the Central government also plays a role in the emerging fishery sector crisis. Intermittent escalation of the cost of fuel coupled with the reduction in the due allocation of kerosene to the State causes serious problems in this sector. This has almost threatened the livelihood security of fishers of the State. The role of illegal fishing perpetrated by foreign factory vessels in our seas is also a factor causing resource depletion.

New issues

Migration of people to the coastal areas, degradation of the coastal infrastructure as well as the coastal ecosystem and climate change are some of the prominent new issues that are detrimental to the fisheries sector. These changes in the existing socio-economic and ecological structure have the potential to seriously distress the marine ecosystem as well as the various biotic and abiotic factors that determine marine productivity. Thermocline variations and other biotic, abiotic processes in the aquatic ecosystem do influence the growth and size of the fish stock. Global warming has resulted in rise in sea level, increased wave action, tidal fluctuations, strong winds, etc. These phenomena cast significant impact on the distribution and migration pattern of fish stocks.

It is highly essential to ensure food security of the people as well as to increase the per capita income of the fisher on par with that of the State average per capita income and that of the fish farmer to be doubled by augmenting the fish production through conservation of both marine and inland resources, rebuilding the exhausted aquatic ecosystems and adopting scientific practices in aquaculture.

This policy envisages the following objectives:

- a) To augment fish production through scientific aquaculture.
- b) To ensure maximum economic returns through value addition.
- c) To double the per capita income of the fish farmer.
- d) To raise the per capita income of the fisher in equivalence to that of the State average by ensuring their social security and welfare.

Chapter 1

Objectives

- 1.1 When the general index of development in the State is considered, it can be seen that the living conditions of the fisher community is still abysmal. Hence, it is highly important to restructure the sector in such a way as to overcome this discrepancy. It is essential to diagnose the problems confronted by the sector and to formulate necessary interventions towards the amelioration of the problems. Hence, under this policy, due consideration to these facts is to be ensured while devising targeted projects, strategic formulation of the objectives and the mode of implementation in different areas of the sector.
- 1.2 It is very important to augment the productivity of the fisheries sector of Kerala, without compromising ecosystem concerns. The interventions we envisage should improve the living standards of the very people depending on this sector. We must also accept that, the interventions in fisheries, is also part of the projects for ensuring social security.
- 1.3 The objectives of this policy are framed on the conviction that the policy underlines the vision to resolve the various issues being confronted by the sector and the society who are dependent on it.

General approach

- 1.4 This policy invariably is built on the core objective of nurturing responsible and sustainable fisheries, with the active participation of the stakeholders for conservation and sustainable management of the aquatic living resources of the State.

Scientific Interventions

- 1.5 It is an undisputed fact that, the emerging challenges in this sector can be faced only through adoption of innovative methods & methodology that come out of Science and Technology globally. In this direction the following interventions are envisaged.
 - i) To augment the fish production in marine as well as inland aquatic systems through adoption of scientific measures
 - ii) To augment the production from aquaculture by adopting scientific practices
 - iii) To enhance price realisation through adoption of innovative technologies for value addition and thus improving the income of the stakeholder
 - iv) To ensure technical updations among department officials through conduct of capacity building programmes in collaboration with National and International research institutions.
 - v) To carry out Capacity Building programmes for department officials in collaboration with both National and International research institutions for imparting the technologies developed so as to strengthen them as well as to conduct trainings for the fisher stakeholders.
 - vi) To establish a master control system to monitor and control the daily activities related to the seas.
 - vii) To protect the interests of the fishers as well as consumers through marketing of quality fish and fish products in hygienic conditions.
 - viii) To promote the export of value added fish products through branding and adoption of innovative technologies in packaging.

Protection of the well-being of fishers

- 1.6 It is vital that the development of the fisher community is at par with the general development of the State, by improving their living standards. This policy suggests the following measures in this regard.
- i) To ensure that the fishers have the right to decide the price of the fish they catch and sell it independently.
 - ii) To strengthen the fishermen cooperatives so as to rescue them from exploitation by middlemen.
 - iii) To implement life saving methodologies to reduce the occupational hazard faced by the fishers.
 - iv) To improve the socio economic condition of the fishers by assisting them in improving livelihood requirements and basic infrastructure development.
 - v) To compensate the loss due to natural calamities to fishers as well as fish farmers, thus enabling rebuilding of the affected enterprises and enhancing their social security.
 - vi) To strengthen the fisheries extension system delivered through *Matsyabhavans* by utilising ICT opportunities like e-governance and m-governance.
 - vii) To complete the debt relief programs initiated by the previous LDF government so as to free the fishers from debt.
 - viii) To provide insurance for livelihood equipments and adopt measures for increasing insurance benefits.

Chapter II Marine fishing

2.1 Kerala has 590 km long coast line from which, 72% of the marine fish production of the State is obtained. It is however, less than 40% at the National level. The total marine fish production came down to 5.23 lakh tons in 2016-17 from, 5.98 lakh tons in 2006-07. Given this declining trend in marine landings, it will be ensured that sustainable strategies will be promoted, through effective monitoring and legislation in the continental shelf area of the State.

Foreign vessels will be controlled

- 2.2 Necessary proposals will be put to the Central Government, for ensuring measures to forbid permission for deep-sea fishing to foreign trawlers and corporate Indian owned vessels and also to prohibit entry of these vessels in Indian waters.
- 2.3 The marine fishing acts and rules will be timely modified, to keep up with the technological innovations and the impact of climate change, pollution, etc on the fisheries sector.

Undesirable trends will be controlled

2.4 In order to control the undesirable practices happening in this sector, control over the maximum number of fishing vessels in different category, minimum mesh size, length of fishing nets and size of nets used, will be brought under control. Manufacture and distribution of illegal nets will be banned. Registration of net manufacturing units will be made compulsory. It will be

mandatory that the permission of fisheries officials is required, for adopting new fishing techniques and for use of newly designed nets.

- 2.5 Strict action will be taken against any destructive fishing practices along the Kerala coast such as, dynamite fishing, light fishing, FADs, poison fishing and bull/pair trawling. Fishing using gears like gillnet, hook and line will be promoted.
- 2.6 Regulation of mechanised fishing vessels within the territorial waters will be effectively implemented. However, licencing of new vessels against replacement of old ones, will be confined to traditional fishers alone. The number of licenses an individual can obtain will be limited. Measures to reassign or withdraw the excess number of vessels above the permissible limit will be undertaken. Introduction of "catch quota system" for mechanised fishing units will be given due consideration.
- 2.7 In order to regulate the number of fishing vessels, the registration of Boat Building Yards with State Department of Fisheries will be made compulsory and in addition, Official approval of design will be made mandatory for construction of new vessels. Provision of facilities like toilets, sleeping berths and kitchen will be made mandatory for mechanized vessels.
- 2.8 Holographic Registration plates for all the registered mechanised fishing vessels will be made mandatory. Bathymetric equipment will be installed in trawling vessels on experimental basis and if found beneficial they will be expanded.
- 2.9 As the continental shelf area is being subjected to overfishing, multiday fishing in areas beyond the shelf that is, in the continental slope area will be judiciously promoted to reduce the overall fishing pressure.

Protection of Juvenile Fishes

- 2.10 Measures will be taken to protect juveniles and regulate size of fish being caught. Minimum Legal Size (MLS) already specified for 58 species will be strictly enforced. The capture, auctioning, selling, marketing, transport and distribution of fish below the MLS will be prohibited.

Protection of traditional fishers

- 2.11 Training and financial support will be given on deep sea fishing techniques like tuna long lining, squid jigging and gill netting to groups of traditional fishers or fisher cooperative societies.
- 2.12 At present, zonation based on depth of operation and where mechanised fishing has been banned is in vogue for the exclusive use of traditional fishers. The rights of traditional fishers will be further protected by introducing more exclusive areas for them. Increasing the operational area of such exclusive zones also will be considered. The impact of the monsoon trawl ban will be scientifically examined and if necessary, the duration of the trawl ban will be extended for achieving full benefits of the ban.

Interventions to maintain the natural integrity of the Ecosystem will be made

- 2.13 While promoting sustainable fisheries development emphasis will be given to maintain the pristine nature of the marine ecosystem. Fish species which are categorised as threatened or facing extinction will be protected. Mangroves, coral reefs and sea meadows are essential fish

habitats which play crucial roles in the ecosystem maintenance and fish abundance. These ecosystems will be protected from anthropogenic activities.

- 2.14 Artificial reefs will be installed at a depth of 12 fathom near existing natural reefs with the active participation of fisher stakeholders. Installation of private reefs will not be allowed.
- 2.15 Pollution in sea causes decline in fish resources. Dumping of Plastic in sea water, unscientific waste processing in the main land and ghost fishing causes detrimental impact on marine fish resources. Measures to regulate coastal and marine litter will be strengthened. A programme titled "*Shuchitva saagaram, Sundara theeram*" (Clean seas, beautiful coasts) will be implemented towards this goal.
- 2.16 In recognition to the international obligation of India Government towards global climate change, the concept of Green fishing which aims to reduce the emission of greenhouse gases from fishing and related activities will be promoted.

Fisheries Management Councils will be formed

- 2.17 Through exchange of ideas between fishermen, officials, scientists and people's representatives, conservation and sustainable development of fishery resource will be ensured and for timely implementation of locally applicable management and regulatory measures, Fisheries Management Councils with a three-tier structure at Village, District and State levels will be formed.
- 2.18 Since the marine sector management depends on the neighbouring States also, measures will be taken with the cooperation of neighbouring states to form an Interstate Fisheries Council for coordinating the marine sector management measures.

Interventions for mitigation of natural calamities

- 2.19 Natural Calamities like, *Okhi* cyclone reminds us about the need to intensify sea rescue operations. In this context, the fisheries stations will be equipped with Marine Ambulance facility. Sea rescue squad will be formed by selecting young men from fishermen community, providing them with expert training and quality gadgets for deploying in fishing harbours and fish landing centres. The existing Standard Operating Procedures (SOP) for Sea Rescue operations will be timely modified.
- 2.20 Facility for satellite enabled communication systems to provide timely alerts and aid rescue operations in fishing villages as well as those engaged in fishing activities in the sea will be established through networking all fishing vessels and coastal villages. Crucial information on weather, potential fishing zones and price of fish will be ensured through this system. The fishers will be provided with efficient and low cost communication tools.
- 2.21 As per the recommendations of the International Maritime Organisation regarding 'Safety of Life at Sea (SOLAS)', surveillance and monitoring systems that assist to locate fishing vessels will be made mandatory for all mechanised fishing vessels. An ICT enabled system to record the departure and entry details of fishing vessels, as well as individual details of the crew will be established. In order to monitor and regulate routine activities related to fishing on a daily basis, a Master Control Mechanism will be established at Vizhinjam, Kochi and Kozhikkode.

2.22 Most of our fishing vessels lack facilities like navigation lights, signals, sea safety equipments and communication gadgets which result in frequent accidents at sea and hence will be made mandatory.

2.23 Majority of the fishermen are ignorant about the United Nations Convention for the Law of the Sea (UNCLOS, 1982) as well as the Exclusive Economic Zones of nations (EEZ) hence leading to entry of our vessels to the EEZ of other nations. Therefore awareness programmes will be conducted among fishers on various international laws like UNCLOS and EEZ.

2.24 Steps will be taken to provide skill training to staff of mechanized vessels in collaboration with National/State level institutions and Universities. In the case of mechanised vessels license will be given to only those vessels for fishing which are manned by trained srank/skipper and engine driver.

Minimum support price for fish will be fixed

2.25 Steps will be taken to fix minimum support price for fish on the basis of landing centre, harbour, market and fish species.

Interests of fish consumers will be protected

2.26 A certificate containing information on the legality of the catch as well as location of the fishing ground and type of fishing gear used will be provided to the owner of the fishing vessel for protecting the interest of the consumer.

Possibilities for Fisheries Tourism will be explored

2.27 The tourism potential in the fisheries sector has not yet been utilized. A scheme for “responsible fisheries tourism” including renting out vessels for recreational fishing, crab hunting and dolphin watching will be implemented with the active participation of fishers.

Chapter III Inland fisheries

3.1 The overall contribution of the inland fisheries sector in fish production is less than 28%. In the wake of marine fish resource depletion, we need to tap the fisheries potential of the inland waters in more scientific and sustainable manner.

Aquatic ecosystems will be protected

3.2 Programs will be implemented to preserve the living aquatic ecosystems and to sustainably manage the endemic biodiversity. Programs will be implemented to conserve those fishes facing extinction. The natural breeding habitats of fish will be scientifically identified and they will be declared as “Fish Protected Areas”. Protected Areas for Clam fishery will be established in Vembanad and Ashtamudi lakes in order to rebuild the clam fishery.

- 3.3 The mangroves which are natural breeding grounds of many fishes will be protected. Mangrove afforestation programs will be implemented along the coasts of backwaters.
- 3.4 Migratory pathways will be created for anadromous as well as catadromous fishes to protect natural estuarine ecosystems.
- 3.5 The inland aquatic ecosystems and fish resources will be protected through proper interventions. Dredging, construction of bunds, and inland water tourism are found to badly affect the inland aquatic ecosystem. Special attention will be provided when such activities are undertaken so as to minimise their adverse impacts. Bunds across water bodies will be constructed only in such a manner that they won't obstruct the natural water course as well as migration pathways of fishes.
- 3.6 River basins which are identified as natural breeding habitats or nurseries of fishes will be specially protected. The inland fish production is declining due to the destruction of such natural breeding habitats. Rearing of hatchery produced fingerlings will be done to increase the production.
- 3.7 A detailed survey to study the factors causing reduction in the depth and area of inland water bodies will be conducted. Interventions including watershed based regulatory will be made to curtail activities that cause shrinkage and defacing of water bodies.

Illegal activities will not be permitted

- 3.8 Illegal fishing methods being followed in inland water bodies will be strictly prohibited and the Inland fisheries rules will be enforced strictly to ensure sustainable / responsible inland fisheries management. The existing Inland fisheries and Aquaculture Act will be timely modified, to organize the inland fisheries sector.
- 3.9 The collection of fish seed or gravid fish from the wild will be regulated to protect the natural fish stock. The collection of indigenous fishes in live condition for export will be regulated.

Protection from Pollution

- 3.10 Measures will be undertaken to prevent the destruction of aquatic ecosystem caused by sewage pollution consequent to urbanization. A committee will be formed to study the impact on fishery resources occurring due to flow of factory waste, sewage and farm runoff into water bodies.

Fish production from reservoirs

- 3.11 Steps for increasing fish production from reservoirs will be undertaken. In the case of large reservoirs with an area above thousand hectares, fishery shall be propagated through rearing of fish seed and fishing will be carried out whereas in the case of small reservoirs, fish culture-based strategies will be adopted. Cage farming technology for seed production in reservoirs will be utilised for ensuring availability of sufficient quantity of seeds for rearing.
- 3.12 The fishing right of all reservoirs including those leased out to Kerala State Electricity Board will be regularized through Department of Fisheries. Considering dam safety and security concerns, the

entry of humans or vessels within one kilometre radius from the dam face will be strictly prohibited. In those reservoirs where such prohibition has not been enforced fishing activities will be regulated by providing fishing permits to local fishers.

- 3.13 The fishing rights in those reservoirs near protected forest areas will be limited to local tribals. The fish species listed as endemic to reserve forest habitats will be produced in hatcheries and ranched in such reservoirs.

Chapter IV Aquaculture

- 4.1 The Government considers development of the aquaculture sector in the State to be given major priority. Efforts in this direction will be based on objectives to increase productivity, adoption of innovative technologies and culture of genetically modified or indigenous fish breeds. The culture of exotic fish breed will be allowed only in those farms with adequate biosecurity measures. Fish farming will be increased by promoting innovative methods like recirculation, cage farming and pen culture technologies.

Seed production

- 4.2 Measures will be taken to produce disease-free shrimp seed and promote shrimp farming using probiotics in zerowater culture systems. Financial support will be given to those who farm fishes like pearl spot, milkfish and mullet as intercrop after each harvest in shrimp farms.

- 4.3 The infrastructure facilities of existing seed production units in the State will be given a facelift so as to fully utilise their capacity and new units will be established in different locations. The fish seed production will be enhanced by promoting small scale rearing units in regional basis similar to satellite production centres. For producing seeds of high genetic purity, 'Fish brood banks' will be established.

- 4.4 For the commercial level seed production of indigenous fresh water fishes like banded snakehead, walking catfish, stinging catfish, climbing perch, thuli and mahseer, facilities will be created to develop hatchery technologies. Efforts will be taken to patent these technologies and to promote farming of these fishes. Hatcheries to produce GIFT (Genetically Improved Farmed Tilapia) and *Litopennaeus vannamei* shrimp seed will be established. Modern technologies will be utilised for the large scale production of fish seed.

- 4.5 Quarantine systems will be established in harbours or import points for facilitating the import of high quality seeds.

The quality and hygiene of feed will be ensured

- 4.6 Measures will be taken to improve the quality of feed and scientific feeding pattern will be adopted. Availability of feeds based on different species, their respective nutrient requirements and feeding schedule will be ensured. A program entitled "*Fish Nutrient Supplementary scheme*" consisting of establishment of Fish feed mills and subsidy component for the purchase of such feeds will be implemented.

4.7 In order to ensure hygiene and disease control in fish farms a scheme entitled "*Fish Health Management Programme*" will be implemented. As a part of this, Aquatic Animal Health Labs will be established in all the districts of the State. Fish seed quality certification, disease diagnostics and treatment, disease prevention, physico-chemical analysis of soil and water samples, directions for remedial measures to be adopted are included in this programme. Scientific advances in biotechnology, molecular biology and nano technology will be made use of in disease diagnostics and health management.

Disease control

4.8 Research related to fish disease and diagnosis will be given importance. Disease surveillance and control systems working under the research institutes, fisheries department and Universities will be coordinated. Activities of the District and State level activities "Fish disease Surveillance team" will be strengthened.

4.9 Registration and licensing will be made mandatory for aquaculture sites, seed production units, and seed nurseries. All activities related with aquaculture in public water bodies like ranching, protection, management and harvest will be regulated through the Department of Fisheries. Fish farming in each water body will be regulated based on carrying capacity.

Eco-friendly nature will be ensured

4.10 'Eco-labelling' and 'Green certification' are at infancy in the aquaculture sector. Ensuring eco-friendly and sustainable measures 'Organic farming' will be encouraged and certification schemes will be implemented.

Aquaculture will be integrated with agriculture

4.11 By integrating aquaculture and measures for protection of watershed with agriculture, sustainable development and integrated socio-ecological system will be ensured. Through adoption of multitrophic approach, vertical and horizontal integration will be implemented.

4.12 Since the farm products obtained from unique ecosystems like *Pokkali* lands, *Kole* lands and *Kaippad* lands are accorded with nutraceutical values, organic nature by default and Geographic indication they have good demand in national and international markets. These paddy lands are having high productivity because of the high fertility enhanced by the natural recycling of nutrients. The farming methods followed in these lands are eco-friendly because of the high humus content, higher rate of mineralisation, use of organic manures, higher levels of soil aeration, and biological control of weeds and algae. By preserving the natural biodiversity, a heritage farming approach will be promoted in these unique ecosystems.

4.13 In those farms, where paddy is cultivated during the monsoon period only, the subsequent increase in salinity is conducive for shrimp farming. Mechanisation is inevitable for paddy cultivation in such waterlogged areas. Steps will be taken to better utilise these facilities.

4.14 Only a single crop of paddy is being taken in fresh water paddy fields lying below sea level especially, in Kuttanad. Though fish farming is practised during off seasons for a period of 6- 7

months the duration is not sufficient for the fish to attain marketable size which needs at least 10 months. If fingerlings are used instead of fry, the marketable size for the fish can be attained during the culture period of 6-7 months itself. If at least 2% of the paddy area is spared for fish seed nurseries in the beginning of the paddy cropping season this problem can be resolved.

4.15 The government will shoulder the responsibility of enabling fish farmers in the State to adopt modern scientific innovations in aquaculture. State fish farms will be converted as model aqua farms which will act as incubation centres for capacity development of farmers. A Brackish water Aquaculture Development Centre at Ayiramthengu and a Freshwater Aquaculture Development Centre at Neyyar will be established. A Package of Practices for fish farming will be prepared and disseminated. Study tours of officials and farmers to locations of aquaculture excellence, both in India and abroad, will be undertaken.

People Participation will be ensured

4.16 The production potential of public inland water bodies will be fully utilised. Fish farming will be encouraged by granting permission for group farming in public water bodies. All public inland waterbodies, except those coming under protected regions, will be used for participatory fish farming without harming the livelihood opportunities of capture fishers. In order to increase fish production from reservoirs, cage farming of fish will be promoted in big and medium reservoirs through fisher cooperatives, SC/ST cooperatives and self-help groups after fixing the optimum number of cages based on carrying capacity studies in such waterbodies.

4.17 Open sea cage mariculture as an option for augmenting seafood production is gaining global attention. With the assistance from Institutes under the Central Government a survey will be conducted to locate suitable sites for open sea mariculture. The open sea cage farming in such locations will be promoted through fisher cooperatives and fisher SHGs.

Ornamental fish farming will be promoted

4.18 Kerala will be converted to a major trade centre for ornamental fishes. By promoting the production of indigenous breeds of ornamental fish, new livelihood and income generation opportunities will be created for women and low income people of the state. Breeding of indigenous varieties and the quality improvement programmes will be developed.

4.19 A brood bank for commercially important marine ornamental fish will be created under the public sector with technical support from Central institutions. Production units for marine ornamental fish will also be created for SHGs under cluster approach.

4.20 Measures will be taken for the import of exotic ornamental fish which will be reared in grow-out systems for selling in domestic as well as international markets.

Financial aid will be ensured

4.21 Steps will be taken to provide low interest bank loans to the fish farmers. Fish farming will be recognised on par with agriculture thus enabling them to avail similar incentives as being given to farmers. Priority will be given to provide electricity for seed production units and fish farms at agricultural rate.

4.22 For farmers who suffered crop loss, crop guarantee will be provided for re-cropping. Those who engage in poaching will be penalised. *Matsya Karshaka* clubs will be formed to promote sustainable fish farming activities.

Utilization of Scientific Techniques

4.23 Resource mapping will be done utilising satellite based technologies like remote sensing, and GIS for the integrated use of aquatic resources. Localised aquatic master plans for aquaculture will be prepared after collecting relevant information for the database. Specific locations suitable for various aquatic technologies like cage fish farming, pen culture, mussel farming and oyster farming will be geomapped.

Functioning of various agencies will be strengthened

4.24 To bring about clarity in responsibilities and duties of officials of various agencies working in the aquaculture sector, all fish farms and seed production units owned by the State will be brought under ADAK. The fourteen FFDAs will be re-organised and strengthened by appointing enough technical hands.

4.25 FFDAs will concentrate on activities to promote fish farming in all districts of the state. The State Department of Fisheries will control and regulate aquaculture activities. A State Aquaculture Advisory Board (SAAB) will be created to provide technical guidance to the government on fish farming.

4.26 Live fish marketing will be promoted on a priority basis. Sale counters for live fish trade will be opened at major cities.

Chapter V Fish Marketing system

5.1 It is important that the distribution system in the fisheries sector is performed in the right way. The loss incurred in the fish value chain is estimated to be 18%. Cold chain system, which will ensure that fish reaches the consumer clean and safe, will be introduced to prevent this loss in the fish value chain.

Cold storage facilities

5.2 Ice plants, deep freezers and similar facilities working under the public sector will be modernised and leased out to fisher cooperatives having good track record or other agencies. The functioning of ice plants, processing plants, chilled storage facilities and transportation facilities will be systematised.

5.3 The unused storage capacity of chilling plants will be made available for short term storing of fish in collaboration with private and public sectors. This arrangement can be used during times of distress harvests and harvest due to natural calamities.

Assurance of fish quality

5.4 It will be ensured that harmful or prohibited substances are not used while marketing fish. The fisheries officials will be trained in the detection of harmful chemicals in fish and these officials in collaboration with food safety department will ensure quality standards in fish.

5.5 Measures can be adopted for issuing 'Quality Certificates' to guarantee quality of fish and fish products thus protecting consumer interests.

Facility for Fish distribution

5.6 The current fish distribution system will be reorganised so as to ensure that the producer gets the reasonable price while the consumer receives good quality fish. An Act to regulate fish auctioneering, marketing and quality will be formulated so as to free the fisher from exploitation by middlemen.

5.7 Existing fish markets will be modernised. "Women friendly fish markets" with provisions for toilets and resting places will be established wherever women are engaged in fish marketing.

Manufacture of Value added products

5.8 Measures for manufacture of value-added products from fish will be adopted. 'Ready to cook' as well as 'Ready to eat' fish products will be made through women SHGs and these products will be marketed through supermarket chains after giving proper branding.

5.9 The consumer behaviour undergoes constant change in accordance with changes in the socio-economic status of the people. To properly understand these changes, current and future demand pattern for fish will be studied.

Chapter VI Fishing Harbours

6.1 Fish landing centres are very essential for fishing. These centres will be designed according to local requirements. Steps will be taken to complete their construction and maintenance on priority basis.

6.2 Steps will be taken to make the existing harbours fully functional. New harbours will be sanctioned based on a comprehensive Integrated Coastal Management Plan. The design of such harbours will ensure to avoid coastal erosion.

6.3 Fishing harbours, fish landing centres and fish markets as well as the coastal roads linking them to the National Highway will be developed and maintained.

6.4 Measures will be taken to improve the quality and hygienic standards of existing harbours.

6.5 Measures will be taken to maintain the depth of the harbours. Long term maintenance contracts will be considered in order to protect the safety of fishing vessels as well as fishers.

6.6 Harbour Management Societies comprising of people's representatives, fisheries officials and fisher representatives will be formed for better management of fishing harbours as well as fish landing centres.

6.7 Those fishers who suffer loss of livelihood, habitat or ecosystem as a result of construction of harbours or renovation activities, will be duly compensated or rehabilitated.

Chapter VII

Development of Fisherfolk

7.1 When compared to the general sector, fisheries sector remains backward in terms of literacy rate, longevity, female-male ratio and infant mortality rate. This sector suffers from issues like poor availability of land, houses and drinking water as well as poor hygienic environment.

7.2 It is very important that the problems faced by fishers who are the most vulnerable section of our society are resolved at the earliest. Comprehensive schemes towards this are being implemented by various related departments of the State. The government will formulate various welfare-oriented programmes to complement the above-mentioned schemes.

Fishermen Rights Protection Act will be implemented

7.3 A Fishermen rights protection act will be implemented to protect the traditional rights of fishers over fish resources, coastal sea, coast, fishing equipments and backwaters.

Interest free loans will be ensured

7.4 Interest free loans through the cooperative sector will be provided for active fishers who want to buy fishing equipment as well as to have working capital for their fishing operations. This will help in making the fishers owners of the equipments and to prevent the existing excessive interest system.

7.5 Survival assistance will be provided to fishers who lose their mandays due to occurrence of storm, wave surge, etc caused by extreme changes in climate by considering it under Natural calamity. If fishermen lose their life at sea, formalities for availing compensation will be simplified and benefit made available to the dependents within a reasonable time.

Schemes for livelihood

7.6 The unemployed educated fisher youth will be given expert training as well as financial assistance for undertaking livelihood activities in other sectors.

7.7 Women form 66% of the labour force in the fish processing sector. Hence programmes envisaged for empowering them and finding alternative livelihood will be formulated and implemented.

7.8 In order to compensate loss of fishing days suffered by fishers activities like beach cleaning, tree/mangrove afforestation for protection of coast, cleaning of water bodies and construction of protection bunds, etc will be included in employment guarantee scheme.

7.9 In order to reorient the youth towards opportunities in the sports sector, necessary infrastructure and skill training will be provided. Special training will be provided to those youth and students who prepare for competitive examinations.

7.10 Priority will be given for improving literacy rate of coastal areas. Awareness programmes for fishers will be conducted in all Fishing Villages. Community motivators will be appointed for this purpose.

Interventions in Education sector

7.11 Seats will be reserved for children of fishers in fisheries related subjects at higher secondary, professional and postgraduate levels. A quota will be fixed for vocational higher secondary (fisheries) students who would like to pursue degree courses in fisheries.

7.12 Steps will be taken to convert Fisheries Technical Schools as 'Centre of Excellence' and to start Vocational Higher Secondary (Fisheries) Education in fisheries schools also.

7.13 Drinking water shortage is very severe in fishing villages due to the excessive presence of salt, coliform bacteria and iron in the underground water. Drinking water will be assured in all fishing villages.

7.14 Coastal waste management will be implemented through the active participation of Local self-government bodies. Septic tanks will be provided to all toilets in the low lying areas of the coast. System for making the coastal sector waste free will be made uniform.

Safe dwellings will be ensured

7.15 Fishers if they desire, will be rehabilitated to safe places, 200 m away from the coast.

Health systems will be ensured

7.16 Steps will be taken to raise the existing 'Health centres' along the coastal area to "Family Health Centres".

7.17 Necessary action will be taken to keep fishers free from consumption of drugs and alcohol.

Cooperatives will be strengthened

7.18 The fishermen cooperative societies which remain inactive will be rejuvenated and it will be ensured that at least one fisher cooperative society is functional in every fishing village. All active fishers will be brought under the umbrella of the fisheries cooperatives. Those societies which cannot be rejuvenated will be terminated.

Problems faced by fisherwomen will be resolved

7.19 Facilities like drinking water, rest places, toilets and cold storage will be ensured for women who work in fish markets. Actions will be taken to end the exploitation suffered by the women who work in the fish processing sector.

Chapter VIII

Awareness & Extension, Human Resource Development and Administrative reforms

8.1 Fisheries sector internationally achieves progress by making use of advancements in the fields of science and technology. Taking this into account the government will make use of the Science & Technology advances made anywhere in the world for moving forward.

8.2 Information on the activities of the government for the benefit of the fisheries sector will be disseminated to the stakeholders by way of mobile apps and websites developed exclusively for this purpose.

8.3 Direct Benefit Transfer (DBT) system will be put in place for all beneficiary oriented schemes. A social auditing system will be implemented to evaluate the services and activities made in the fisheries sector.

8.4 The collection of statistical data of landings from inland water bodies & marine capture fisheries, crafts & gears and socio-economic profile of fishers will be accomplished in a more efficient manner. The information will be timely compiled and published.

8.5 The 100 numbers of *Matsyabhavans* sanctioned during the Ninth Five Year Plan will be made operational. 100 more *Matsyabhavans* will be established for the inland fisheries sector

8.6 Participatory Resource Management Policies and programmes will be formulated through the active participation of all fishers, allied workers, boat owners, officials, scientists and voluntary organisations related with the fisheries sector. Fisheries Resource Management Councils will be formed at village, district and state levels.

Trainings will be ensured

8.7 The technical hands of the Department will be given induction training, periodic refresher training and subject matter-based training. The technical wing of the Department will be strengthened through human resource development programmes designed in collaboration with national and international Universities and Research institutions.

8.8 The syllabus of the mandatory training programmes given to the department officials will be modified. The duration of the programme will be increased.

8.9 Steps will be taken to appoint those with professional degrees in technical posts. The delivery of socio-economic benefits to the stakeholders will be made more efficient and fast. This will result in sustainable fisheries production in the state.

8.10 The duties and responsibilities of various institutions serving the sector like Fisheries Department, Harbour Engineering Department, Kerala State Cooperative Federation for Fisheries Development (MATSYAFED), Kerala Fishermen Welfare Fund Board (KFWFB), Kerala State Coastal Area Development Corporation (KSCADC), Aquaculture Development Agency of Kerala (ADAK), State Fisheries Resource Management Agency (FIRMA), Society for Assistance to Fisherwomen (SAF), National Institute of Fisheries Administration and Management (NIFAM), and Kerala University of Fisheries and Ocean Studies (KUFOS) will be clearly defined. A clear division based on activity of sector will help for optimum utilization of the available manpower and time. Systems or components of similar mandates will be integrated or re-organised.

Interventions in the academic field

8.11 In order to impart the innovations of research institutes for the benefit of fishers and fish farmers a facility for carrying out Adaptive Research will be created under the Department of fisheries.

8.12 The status of KUFOS will be elevated to International standards in co-operation with International Institutions. Separate faculties for Fisheries Science and Ocean studies will be fruitfully introduced in the University. Steps will be taken to establish new Fisheries colleges and Ocean study schools in the University.

8.13 The syllabus will be modified by giving priority for skill development of the students. This is expected to shape professionals who are competent to undertake the tasks for the development of both fisheries and oceanic sectors. In order to reorganize the activities of the University in this manner, steps will be taken to make necessary amendments in the law.



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