

Challenges of fisheries sector and the response of budget 2022-23

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1. Introduction

The fisheries sector occupies a pride of place among various sectors of Kerala economy, in the sense that it provides livelihood to a large mass of underprivileged sections of the Kerala society and at the same time is crucial in achieving the nutrition and food security goals of the state. The sector employs around 10.44 lakh people, with 2.4 lakh of them being inland fish workers. India being one of the largest food producing countries in the world account for about 7.58 per cent of global production. The fisheries sector contributes about 1.24 per cent to GVA and 7.28 per cent of GVA from the agriculture sector (Government of Kerala 2021). In 2019-20 alone the country exported around 12.9 lakh metric tonnes of marine products (Rs. 46,662 crores).

Kerala occupied the fourth position in marine fish landings in India with a production of 4.75 lakh tonnes. The state is blessed with a large number of fresh water resources including 44 rivers and nine major lakes which have a combined area of 1620 hectares. With a coastline of about 590 Km and an Exclusive Economic Zone (EEZ) of 2.18 lakh sq. Km, the state has huge potential in the fisheries sector. The Kerala Marine Fishing Regulation Act (KMFRA) was amended to strictly regulate the fisheries sector, such as preventing juvenile fishing, and this led to an increase of 26 per cent in marine capture in 2018-19. However, the marine fish production showed a decline in the years 2019-20 and 2020-21, mostly due to the rough weather at sea. In fact, marine fisheries sectors across the globe are going through challenging times due to climate change issues, change in ocean temperature and the current rate of marine biodiversity loss due to exploitative fishing practises.

In this context this paper discusses the major challenges in the expansion and modernization of the fisheries sector in the state and reflect on some of the governmental efforts to overcome these challenges through various budgetary and off-budgetary schemes. The paper is divided into four sections accordingly.

2. Challenges

Perhaps the single biggest drawback of the fisheries sector in Kerala is that it is not able to capitalize on the huge domestic demand and is heavily import dependent. As in the case of food grains and vegetables, Kerala is deficient in fish production. While the total domestic fish consumption in the State is approximately 9.12 lakh tonnes per annum, or about 2000-2500 tonnes per day, the marine production lags behind at just 4.75 lakh tonnes per annum. Of the annual consumption, about 3 to 4 lakh tonnes (or about 60 per cent) is imported from other States or countries, especially for consumption in urban areas.

A major problem affecting the income of fisherfolk is that the share of high value species in the total catch is very low. Some of the common commercially important fish species found along the Kerala coast are White Prawn, Pink Shrimp, King Prawn, Scampi, Deep Sea Lobster, Mud Crab, Sea Crab, Green Mussel, Clam, Indian Mackerel, Seer Fish, Black King Fish, Little Tunny, Snapper, Malabar Reef Cod, Croaker, Malabar Trevally, Ribbon Fish, Indian Oil Sardine, Commerson's Anchovy, Barracuda, Pearl Spot etc. and many of these are endemic to the Kerala shores. Low share of high value species is evident from the fact that while Kerala's accounts for 13.3% of the total quantity of fish harvested in India, its contribution to total value is only 12.84% (Government of Kerala 2021).

As per data released by the Department of Animal Husbandry Dairying and Fisheries (2020) and by the Department of fisheries government of Kerala (2021), while a lion's share of fish production in India comes from inland fisheries (74%), we get to see an opposite trend in Kerala where production is dominated by marine fisheries (64%). Fish production in Kerala, in 2018-19, was estimated at 1.92 lakh tonnes from the inland sector and 6.1 lakh tonnes from the marine sector. of this, the inland sector's contribution is barely 20 per cent. However, with a rise of 6.3 per cent, the marine sector showed a moderate growth in its VOO, while at the same time the inland fisheries sector showed a substantial increase in its VOO (growth of 58 per cent). The inland fisheries sector remains underexplored and underutilized (Government of Kerala 2021).

Due to climate change and anthropogenic activities such as juvenile fishing, overfishing, unscientific fishing, the catch of marine fisheries shows a declining trend in the last decade. The marine fish production in the State in 2020-21 however shows a decline. This may be because of poor climatic conditions and rough weather at sea. The decline in marine fish catch is due to overfishing, indiscriminate juvenile fishery, and the capture of brood fish. The inland fisheries sector has great scope for further development but as of now remains underexplored and underutilized. The loss of man-days due to Covid-19 pandemic, accelerating rate of coastal erosion and rise in the average sea temperature also aggravated the stressful situation in the sector.

3. Budgetary response to the challenges

In the budget of 2022-23, an amount of Rs. 240.64 crores are earmarked for various schemes in the fisheries sector (Rs. 37 crores more than the previous year's allocation). The total outlay provided for the sector in the Budget 2022-23 is presented in table 1.

Sl. No.	Department/Agency	Amount (Rs Lakhs)
1	Fisheries Department	13983.00
2	Harbour Engineering Department	3007.00
3	KUFOS	3350.00
	TOTAL	20340.00

Source: Kerala Budget, 2022-23.

Sl. No.	Scheme	Amount (Rs Lakhs)
1	Marine ambulance for the security of fisherman	250.00
2	Motorization of Traditional Fishing Crafts	150.00
3	Modernisation of Fish Markets, Value Addition Post-Harvest Activities	350.00
4	Mariculture Activities	10.00
5	Removal of Plastic from water bodies-"Suchitwa Sagaram"(HED)	50.00
6	Pradhan Mantri Matsya Sampada Yojana (PMMSY) - Integrated Development and Management of Fisheries (CSS 60% and SS 40%)	1400.00

Source: Kerala Budget Data, 2022-23.

3.1 Inland fish production

The fisheries sector in Kerala is characterized by the predominance of the marine fisheries production over inland production, whereas the opposite is true in the case of the country as a whole. While the total marine capture fish production in 2018-19 was more than 600,000 tonnes, inland aquaculture contributed to just about 25,000 tonnes only. The Central Marine Fisheries Research Institute (CMFRI) in one of its reports raised an alarm that the demand-supply gap for fish is only going to increase in the future. It is estimated that Kerala has already attained an optimum-level of production in marine fish resources. Thus, it is high time that the state tap into its potential in developing the inland fisheries sector.

Kerala, with its vast aquatic resources in brackish water and freshwater, has immense potential for developing inland aquaculture. The state is blessed with 44 rivers with a total length of 3092 km, 5295.93 ha of freshwater ponds and tanks, 65213 ha of brackish water areas and 46128 ha of backwater stretches that are suitable for aquaculture, pen and cage culture. The table 2 shows the major fresh water resources of Kerala.

Districts	Panchayath Ponds	Streams and Holy Ponds	Village Ponds	Irrigation Tanks
Thiruvananthapuram	1706	67		34
Kollam	589	188	16	17
Pathanamthitta	390	66		6
Alappuzha	340	303		3
Kottayam	226	207	7	75
Idukki	65	25		47
Ernakulam	719	201	54	72
Thrissur	959	305	3	228
Palakkad	629	334	6	60
Malappuram	545	275	7	45
Kozhikode	96	264	11	24
Wayanad	28	5	22	61
Kannur	292	312	9	35
Kasaragod	264	137	50	145
Total	6848	2689	185	852

Source: Fisheries Handbook (2020).

The outlay earmarked for inland fisheries in the budget of 2022-23 is ₹ 8423.00 lakh which includes 7 main schemes as stated in table 4.

Table 4: Outlay on inland fisheries, Budget (2022-23)		
Sl. No.	Scheme	Amount (in Lakhs)
1	Aquaculture Development	6662.00
2	Sea safety and sea rescue operations	550.00
3	Aquatic Animal Health Surveillance and Management	100.00
4	Reservoir Fisheries Development	200.00
5	Cleaning of Vembanad Lake	100.00
6	Aquaculture Extension Services	711.00
7	Operational expenses for KAVIL	100.00
Source: Kerala Budget Data, 2022-23		

3.2 Aquaculture development

In recent times aquaculture has become a very profitable business, with elaborate cage facilities in inland and brackish waters supported by multi-species seed-production hatcheries. The proposed aquaculture activities include (with an expected outcome of 45000 tonnes of aquaculture production):

- One paddy - one fish/shrimp farming;
- Farming of shrimp, crab and mussel
- Farming of carp, Nile tilapia, Pangassius and indigenous fish in the pond
- Intensive fish farming viz. aquaculture in bio floc tank, cage, Pond and Recirculatory Aquaculture System (RAS).

3.3 Reservoir fisheries development

The scheme envisages fish stock enhancement programme for small reservoirs, with it being limited with the seeds of endemic carps, endemic catfishes, Pearl spot and Mahaseer, in the case of reservoirs within wildlife sanctuaries. Also, it discusses the possibility of cage

farming of fish in the case of large reservoirs. An amount of ₹ 200.00 lakh is provided for implementation of the scheme.

3.4 Social and financial security of fisher folk

It is estimated that the population of fish workers in Kerala is around 10.50 lakh, with 2.4 lakh of them being inland fisherfolk. The number of active fish workers, those fish workers who are engaged in fishing for their livelihood, registered with the Kerala Fishermen Welfare Fund Board in the State as of 2020 is 2,40,211. The Government has rolled out several schemes to ensure the social security and livelihood of fish workers. Such schemes are implemented by the combined efforts of the Fisheries Department, KFWFB and Matsyafed. The schemes include those for housing, insurance and pension apart from the ones which enable fish workers to earn livelihood on a continuous basis.

The Society for Assistance to Fisherwomen (SAF) has put in huge efforts for enhancing the entrepreneurial skills among fisher women by encouraging microenterprises. SAF offered assistance to 398 fisherwomen beneficiaries (138 groups) to start micro-enterprises. The government showed support to 242 Theeramythri activity groups which have been assisted with interest free working capital in 2020-21.

a) Saving cum relief scheme (2017-18)

This scheme was designed so as to provide the fishermen with lean seasonal relief. The beneficiaries will receive a total amount of Rs.1500 each, in six instalments of ₹250 per month. Both the state and the central governments make an equal payment of ₹1500 each.

A total of 1.58 lakh fish workers and 21,743 allied fish workers were provided support under the 'Saving cum Relief Scheme'.

Sl. No.	District	Beneficiaries (Marine)	Beneficiaries (Inland)	Amount (in Lakhs)
1	Thiruvananthapuram	37139	37139	1072.57
2	Kollam	28689	28689	901.52
3	Pathanamthitta	0	0	2.96
4	Alappuzha	36012	36012	1277.53
5	Kottayam	0	0	94.725
6	Idukki	0	0	2.785

Table 5. District wise list of beneficiaries (marine and inland fisheries) of the saving cum relief scheme.

Sl. No.	District	Beneficiaries (Marine)	Beneficiaries (Inland)	Amount (in Lakhs)
7	Ernakulam	15917	15917	649.32
8	Thrissur	4964	4964	159.55
9	Palakkad	0	0	7.65
10	Malappuram	17282	17282	498.27
11	Kozhikode	19977	19977	596.88
12	Wayanad	0	0	0
13	Kannur	3808	3808	139.68
14	Kasaragod	8484	8484	252.60
	TOTAL	172272	24143	5656

Source: Fisheries Handbook (2020).

b) Housing scheme from 2016-17

The Department took an initiative to build 5457 safe houses for homeless fisherfolk. The rehabilitation of another 4500 fisherfolk is currently in progress. 1619 homeless fisher families received new houses under the LIFE Mission. The government is also moving forward with the construction of a housing complex with 192 flats to rehabilitate fishermen who lost their land and houses at Muttathara, Thiruvananthapuram. The floor area of each of these flats is 542 sq. feet. Table 6 presents district wise expenditure on various housing schemes

Table 6. District wise expenditure on various housing schemes			
Sl. No.	District	Housing @ 2 lakhs	Housing @ 4 lakhs
1	Thiruvananthapuram	979	211
2	Kollam	490	50
3	Alappuzha	569	15
4	Kottayam	91	
5	Idukki	5	
6	Ernakulam	170	1
7	Thrissur	50	6
8	Palakkad	5	
9	Malappuram	423	37
10	Kozhikode	250	10
11	Kannur	50	22
12	Kasaragod	67	48
	Total	3149	400

Source: Fisheries Handbook (2020).

3.5 Vidyatheeram scheme

The Vidyatheeram scheme aims to subsidize and aid the children of fishing families in preparing for various entrance exams as well as job tests. The scheme will help in better representation of children from fishing communities in educational institutions and in various government jobs. The allocations for the scheme from 2016 to 2020 are given table 7.

Table 7. Allocation for various coaching and training programmes under the Vidyatheeram scheme				
Activity	2016-17	2017-18	2018-19	2019-20
Medical Entrance	33	50	56	84
Civil Service	2	10	10	12
Bank Test	17	19	18	20
PSC	75	68	55	48
Source: Fisheries Handbook (2020).				

3.6. Infrastructure development and R&D

The government spent a total of Rs 403.5 crore under marine infrastructure development schemes. Using this fund eight fishing harbours at Chellanam, Vellayil, Muthalapozhi, Chetuva, Tanur, Koyilandy, Thalai, and Manjeswaram were constructed. The Parappanangadi and Chethi harbours were completed at a cost of Rs 209.04 crore using KIIFB funds. The Plan has also supported the development of Thankassery, Puthiyappa, Beypore and Arthunkal fishing harbours as well as establishment of Harbour Management Societies to manage these harbours. Total earnings from fishing harbours and fish landing centres in 2020-21 was ₹4.36 crore. For the very first time in India, Fisheries Management Councils were formed with the participation of managements, fisheries representatives, people's representatives, and fisheries experts.

In addition to the construction of fishing harbours, NABARD funds and other funds were utilized for construction of fish landing centres, roads, bridges, locker rooms, artificial reef in the coast of Poovar and Puthyathura fishing villages as well as modernization of existing fishing harbours. Between 2017 and 2021 around Rs 704.1 crore was spent for the construction of more than 1600 coastal roads. The government spent Rs 193.5 crore to construct more than 65 fish markets. About 200 fibre-reinforced plastic (FRP) vessels were

provided to fishermen as part of the Blue Revolution scheme. The fisherfolk also received 10 deep sea fishing boats on a pilot basis. A new mobile app called 'Sagara' was developed to record the departure and return of fishing vessels at sea.

3.7 Technological advancement

The government has taken a very proactive role in infusing the latest of available technology to modernize the fisheries sector and improve the efficiency of fish stock breeding, fish harvesting etc. These include:

- Bio floc Technology (BFT) - is a technique for improving the quality of water in aquaculture by balancing carbon and nitrogen in the livestock system. BFT not only treats waste but also helps nutrition to aquatic animals. Since it is viable technology Government of Kerala is promoting BFT wherever possible.
- Recirculating Aquaculture System (RAS) - In order to maintain water quality, efficient filtration systems need to be installed to ensure the optimum growth of fish. A Recirculating Aquaculture System ensures that water flows back to the culture system after filtration (mechanical, biological or chemical filtration) so that the water quality is maintained throughout the culture. Although this is an energy intensive and expensive mode of aquaculture, it is used in urban areas where the water area available for aquaculture is limited.
- Aquaponics - is a synergic system between fish and plants in which both grow together in one integrated system. In an aquaponics system, water flows from a fish tank into a biofilter where bacteria break down the fish waste into an organic nutrient solution. The plants then absorb the nutrients from the water before it is re-circulated to the fish tank. This is also a dynamic and energy-intensive system and needs utmost care in implementation

Technology improvement through SAF (2018-19)

The Society for Assistance to Fisherwomen (SAF) was established to promote self-employment opportunities among the highly disempowered fisherwomen of Kerala and aims at creating suitable income generating activities for them, such as through the 'Theeramythri' scheme. District wise data on the beneficiaries of SAF schemes is presented in Table 8.

District	Fisher Women Benefited	Amount (Lakhs)
Kasaragod	23	1.99
Kannur	17	1.46
Kozhikkode	59	4.27
Malappuram	3	0.21
Thrissur	98	8.4
Ernakulam	126	13.84
Kottayam	49	4.37
Alappuzha	24	2.14
Kollam	35	3.28
Thiruvananthapuram	68	5.2
Total	502	45.16
Kollam	35	3.28
Thiruvananthapuram	68	5.2
Total	502	45.16

Source: Fisheries Handbook (2020).

3.8 Motorization of traditional fishing crafts

Motorization of the traditional fish crafts helps in increasing the efficiency and reducing the operation time in fishing. It also promotes deep sea fishing. Table 9. Presents data on amount spent on procurement of advanced fishing gear

Sl. No.	Components	Amount (in Lakhs)
A	Procuring large meshed gill net and sophisticated equipment for line fishing	20.00
B	Procuring new outboard motor of less than 10 hp	30.00
C	Insulated boxes	75.00
D	Procuring towing tractor	25.00

3.9 Value addition and modernization of post - harvest activities

Because of the perishable nature of the fish caught, it is estimated that every year about 18 per cent of the total fish catch is discarded as spoiled fish. This can be avoided to a great extent by expanding the cold chain networks which includes providing insulated boxes in fishing craft, reefer chilled storage in harbours, onshore chilled storage facility,

modernization of fish landing centre & harbour and wholesale market (for hygienic handling and quality assurance) and insulated vehicle (for better transport), fish collection/procuring centres/base stations and hygienic fish sales outlet at the endpoint.

3.10 Climate resilience, sustainability and disaster relief

The residents along the coasts of Kerala have long been tormented by frequent rages of cyclones causing immense damages to life and property. Many still live in houses damaged by the sea and many are waiting for rehabilitation. The government has initiated several schemes to ensure the fish workers lead a safe and secure life with no impending threat to their life or property. The activities include repair of damaged houses, rehabilitation efforts, accident insurance scheme, sea safety training, sea rescue operations and a marine ambulance service exclusively for the fisher folk.

a) Rehabilitation and house repair

The government is committed to ensure safe and habitable living spaces for the fisherfolk, many of whom do not have sturdy houses and still more rendered homeless due to the wrath of the raging sea. The amount allocated under various rehabilitation and housing schemes is given in table 10.

Sl. No.	Districts	Rehabilitation	House Repair	Ockhi House
1	Thiruvananthapuram	723	1974	26
2	Kollam	217	288	4
3	Alappuzha	188	736	
4	Kottayam	0	100	
5	Idukki			
6	Ernakulam	112	423	9
7	Thrissur	19	50	26
8	Palakkad			
9	Malappuram	93	634	5
10	Kozhikode	127	57	
11	Kannur	147	133	
12	Kasaragod	172	105	2
	TOTAL	1798	4500	72

Source: Kerala Marine Fisheries Statistics, 2015.

b) Accident group insurance

2.43 lakh fish workers and 85,543 allied workers benefitted from the Group Accident Insurance Scheme. The fishing fleet of Kerala comprises of 6231 mechanised vessels, 31,664 motorised vessels and 2,806 non-motorised traditional vessels. Around 924 fishing crafts in 2020-21 has been insured. Data on fishermen and allied workers covered by insurance schemes during 2015-2020 is presented in Table 11.

Table 11. Data on fishermen and allied workers covered by insurance schemes (2015-2020).		
Year	Fishermen (Lakhs)	Allied Workers (Lakhs)
2015-16	238.59	137.20
2016-17	345.00	140.46
2017-18	631.36	209.70
2018-19	1126.94	333.98
2019-20	1136.16	213.77
Source: Fisheries Handbook 2020.		

c) Marine ambulance for the security of fishermen. (Outlay: Rs.250.00 lakh)

After the devastating Ockhi disaster, in order to reduce mortality at sea, it was decided to introduce three marine ambulances equipped with all modern gadgets, paramedical staff and provisions for onboard medical care, which will serve as rescue vessels for support under distress situations. The marine ambulances were equipped with all modern facilities required for emergency medical aid for 10 persons at a time. The Government commissioned marine ambulances for three zones: Vizhinjam in Thiruvananthapuram, Vypin in Ernakulam, and Bepore in Kozhikode. An amount of Rs. 250.00 lakh is provided for meeting the operational expense which includes fuel cost, cost of medicines, AMC, insurance charges and contractual wages in connection with the maintenance of the three marine ambulances. Further, 19 coastal hospitals were constructed in the health sector.

d) Sea safety and sea rescue operations

The scheme aims to provide 75 per cent grant to the fisherfolk for the purchase of sea safety equipment such as Global Positioning System, Marine communication equipment, Life buoy and life jackets and Automatic Identification System (AIS)/ Satellite-based communication/

vessel tracking devices. In order to develop a comprehensive and quick-action sea rescue operation mechanism, the schemes propose the following:

- to ensure the recording of entry and exit of fishing vessel by establishing punching booths/facilities in fishing harbours and weather forecast data dissemination
- to provide training to fishermen as Deckhands/Engine driver/Syrang
- to engage harbour-based team of trained fishermen for sea rescue operations as per need.

e) Removal of plastic from water bodies -"Suchitwa sagaram"(HED)

This is a proposed scheme (Clean Sea), to bring down the accumulation of plastic wastes in the sea and thereby save aquatic fauna from the plastic menace. The scheme proposes to employ fishermen to collect garbage from the sea bed and recycle the same to use in the road surfacing works. Thus, the scheme at the same time resolves to solve the problem of marine pollution, enhance employment opportunities and the additional income of the fisherfolk and use the waste collected for a more environmentally friendly method of road construction. About 38.4 tonnes of discarded nets, plastic ropes, and other plastic items have so far been removed by fish workers from the sea.

An amount of Rs. 50.00 lakh is earmarked as outlay for this project in the budget of 2022-23. Suchitwa Sagaram was implemented in Neendakara in Kollam in collaboration with the Society for Assistance to Fisherwomen (SAF), Local Self Government Institutions (LSGIs) and the Suchitwa Mission. This project was noted by the United Nations.

f) Cleaning of vembanad lake

The Government of Kerala has launched an initiative to clean up Vembanad and Ashtamudi lakes with a view towards protecting and conserving the natural ecosystem of brackish water lakes of the state. The scheme involves the participation of all the direct and indirect stakeholders and LSGs. An amount of Rs. 100.00 lakh is provided for the scheme in annual budget 2022-23.

3.11 Social mobility

The government established more than 2500 micro-enterprises so as to promote alternative livelihood activities, providing livelihoods for over 7000 fisherwomen. An Apparel Park Consortium was established at Kundara, Kollam, where 12 microenterprise units covering 48 fisherwomen beneficiaries were established. Employment was created for 230 fisherwomen in 9 coastal districts by establishing 46 "Coastal Friendship" (Theeramythri) seafood restaurants. Table 12 presents data on livelihood providing activities financed by the government.

Districts	Interest Free Loan (Lakhs)	Development of Micro Enterprises (Lakhs)	Shift to Appropriate Business (Lakhs)
Kasaragod	228.6	72.81	0
Kannur	4.7	43.51	0
Kozhikode	0	70.35	1
Malappuram	0	67.89	0.5
Thrissur	33	102.75	2
Ernakulam	291.8	76.6	1
Kottayam	469.4	75.33	0.5
Alappuzha	119.7	72.44	0
Kollam	56.6	79.45	1
Thiruvananthapuram	1208.5	62.14	0.49
Total	2412.3	723.27	6.49

Source: Kerala Marine Fisheries Statistics, 2015.

3.12 Conservation of fish species

With the stock of marine fish catch dwindling by the year, it is absolutely essential to protect and preserve the local fish species along our shores (as well as the fresh water species) to ensure sustained livelihood for the fish workers and food security for the state. A total of Rs. 15 Crore. is earmarked for fisheries resource conservation in 2022-23, which includes 3 major schemes. Amount spent on conservation of (both inland and marine) fish resource is presented in Table 13.

Sl. No.	Scheme	Amount (in Lakhs)
1	Conservation and Management of Inland Fish Resource	500.00
2	Conservation and Management of Marine Fish Resource	900.00
3	Surveys, Studies and Investigation for Fisheries Infrastructure	100.00

Source: Fisheries Handbook 2020.

a) Conservation and management of fish resources (inland)

The scheme aims to increase the fish production in the state by protecting the natural fish stock by conducting patrolling to prevent illegal fishing, setting up Fisheries Management Councils (FMCs), by the establishment of a protected area, by enhancing the fish stock through ranching, mangrove afforestation and restoration of damaged aquatic ecosystems. The scheme seeks to make use of remote sensing and geographical information system for fisheries resource mapping, buy-back of licensed stake net, and Chinese net as well as assessment of fish catch.

b) Conservation and management of fish resources (marine)

The state needs to adopt effective management principles and surveillance techniques if we want a sustainable use of marine resources to ensure nutritional food security, economic growth, and protect the sole livelihood of fisher folk. This will require steps like co-management of marine fishery resources & functioning of Fisheries Management Councils (FMCs), implementation of KMFR Act, fitting of holographic registration plate, camera surveillance in the fishing harbours and fish landing centres, establishment of new fisheries stations, establishment of effective communication network, marine catch data collection, installation of square mesh & Turtle Excluder Device(TED) in trawl nets, certification of species, establishment of artificial reefs/marine protected areas, model fishing boat and hiring of 20 patrol boats for sea patrolling and employment of fisheries rescue guards on contract basis.

c) Aquatic animal health surveillance and management

This is a very practical scheme with an objective of timely identification of disease in the early stage itself, which may reduce the mortality rate and further spread. It proposed to do so by establishing Mobile Aqua Laboratories to conduct clinical examination of live/dead aquatic animals, sample fixing, water and soil quality analysis. An amount of ? 100.00 lakh is provided for the scheme during 2022-23.

3.13 Surveys, studies and investigation for fisheries infrastructure

The scheme proposes to take up surveys, studies and investigation works of infrastructure works pertaining to Fisheries and Coastal Area Development and conducting techno-

economic feasibility studies for fisheries infrastructure projects. Fisheries infrastructure includes fish landing centres, fish harbours, bridges, roads, groynes, offshore and detached breakwaters and beach nourishment works. The scheme seeks to establish a comprehensive and permanent data bank of the morphological and environmental changes in coastal zones which will be beneficial for the future planning and design of various coastal structures like harbours and shore protection works. The technical investigation includes surveys, hydrodynamic data collection and subsoil investigations. The scheme tries to incorporate technical assistance from competent agencies like KUFOS, wherever and whenever it is required.

3.14 Government response during the pandemic

The biggest blow to the fish workers during the pandemic was the breakdown of international markets and global trade which affected the export performance of the fisheries sector and the income of the fisher folk. The restrictions and the closure of global markets affected in particular fresh fish and shellfish supply chains and the processing sector due to the weak global demand. All fishing harbours and fish landing centres in Kerala were closed down with the imposition of the lockdown. Trolling with the use of mechanised fishing boats was prohibited and fish auctions too were not allowed. Only traditional methods of fishing were allowed, but they too were asked not to auction their products, as social distancing measures were difficult to implement. The government entrusted the Harbour Management Societies to manage the purchase and sale of fish at a price fixed by the government.

The government introduced a token system in the harbours to implement social distancing rules. Even a mobile application was developed for the online marketing of the catch. All aquaculture activities, hatcheries and fish farms, as well as the movement of seed, feed and other essentials were exempted from the lockdown restrictions by a special order. To financially help the fish workers traumatized by the pandemic, SAF provided financial assistance in the form of long-term loans at reasonable interest rates. During the pandemic period 359 micro enterprises were assisted with term loan of ₹5 crore from Kerala Bank.

4. Conclusion

The fisheries sector makes significant contributions to the economy of Kerala. There is a huge scope for the further development and modernization of the sector, especially the

development of inland fisheries sector and aquaculture activities. The state has much more to achieve towards ensuring income stability and social security of the fish workers' community. Problems faced by the fisher folk such as reduction in catch lately, lack of proper fishing and safety equipment, low levels of higher educational attainments, ease of social mobility, lack of proper housing and coastal infrastructure facilities etc. should be studied in detail and attempts must be made to resolve them. The government must also look into the damages caused by climate change as well as wave after wave of cyclones on the lives of fish worker communities. The aim should be to make fishing a safe and rewarding profession in the near future and the upliftment of fishing communities who are shown to be the outliers of Kerala model of development. Without facilitating their catch up with rest of Kerala society, our achievement of Sustainable Development Goals (SDGs) will remain a distant dream.

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