MPEDA

Newsletter

Vol.VI/No.7/ OCTOBER 2018

ISSN 0245-7059

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CPF-TURBO PROGRAM

The shrimp industry has seen major developments and tasted success over the years, And not only are we proud to be part of it, but also take pride in pioneering it. To ensure the success and profitability of the Indian Shrimp Industry, our highly determined team with committed Aquaculture specialists constantly provide the shrimp farmers with access to the latest and updated technology.

CPF-TURBO PROGRAM -
Pioneering Successful and Profitable Shrimp Aquaculture

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Volume VI, No. 7, October 2018

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Printed and Published by
Mr. B. Sreekumar, Secretary
on behalf of The Marine Products
Export Development Authority
(Ministry of Commerce & Industry, Govt. of India)
MPEDA House, Panampilly Avenue
Kochi - 682 036, Tel: +91 484 2311979

Published by
MPEDA House
Panampilly Avenue
Kochi - 682 036

Printed at
Print Express
44/1469A, Asoka Road
Kaloor, Kochi - 682 017

K. S. Srinivas IAS
Chairman

Dear friends,

Subsequent to the visit by the US NOAA team, MPEDA has conducted a series of stakeholder workshops to enlighten them on the procedures and compliance requirement under the Seafood Import Monitoring Programme (SIMP). I got reports there had been overwhelming response from the stakeholders to those programmes in all the regions wherever arranged. Those programmes were arranged to instill confidence among the key players in the export supply chain in complying with the documentary and procedural requirements of SIMP. This will facilitate easy transition of our shrimp cargo into the US from 1st January, 2019.

Based on the request filed by MPEDA before the US Department of State, a team of experts will be visiting the shrimp harvesting systems in West Bengal and Odisha to understand the methods by which wild caught shrimps are harvested, species of shrimps harvested, the types of gears used, and also to observe that whether those systems interfere with the marine turtle population.

This is in light of the US decision to temporarily disallow the export of wild caught shrimp from India. This was consequent to the listing of certified nations that are allowed to export wild caught shrimps to US, in compliance to the provisions of Section 609 of US Public Law 101-162, vide their Federal Register Notice dated 16th May, 2018. However, India is still permitted to export shrimps from aquaculture to the US market.

US is a major market for Indian wild caught shrimps also and hence getting enlisted as a certified nation will be helpful in restoring the export of wild caught shrimps to the US, which will help ultimately the small scale fishermen that are practising subsistence fishery operations in near shore waters and back waters across the country.

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MPEDA at SEAFEX 2018, DUBAI

Background

The United Arab Emirates (UAE) is a federation of seven emirates; Abu Dhabi, Dubai, Sharjah, Ajman, Fujairah, Ras al-Khaimah, and Umm al-Quwain. Each emirate is governed by a hereditary 'Emir' who jointly forms the Federal Supreme Council, which is the highest legislative and executive body in the country. One of the emirs is selected as the President of the United Arab Emirates. His Highness Sheikh Khalifa bin Zayed Al Nahyan, Ruler of Abu Dhabi, is the present President of the United Arab Emirates.

The capital is Abu Dhabi, which is one of the two centres of commercial and cultural activities together with Dubai. UAE has a total land area of 83,600 sq. km. and is having a coastline of 1,318 Km, sharing land border with Oman and Saudi Arabia. UAE is home to 94 lakh people out of which 88% of the population is emigrants. Emirati 11.6%, South Asian 59.4% (includes Indian 38.2%, Bangladeshi 9.5%, Pakistani 9.4%, other 2.3%), Egyptian 10.2%, Philippine 6.1%, other 12.8%.

The Middle East is one of the most diverse regions in the world. Despite some turmoil in the region, the country is ranked as the 3rd safest location to live in the world.

SEAFEX was started 12 year ago in Dubai and has now become a global exhibition. The show has grown 56% in size since launch and SEAFEX 2018 was its seventh edition. This time SEAFEX was held at Dubai World Trade Centre along with 'Yummex' the biggest show for snacks and confectionery in Mena region. SAEFEX-2018 was spanned over a space of 4000 sq. m. at Hall 'ZAB3' of Dubai World Trade Centre. It offered an integral platform for professionals of seafood and its allied industry professionals to interact and expand their business.

The visitors consist of international traders, wholesalers, importers, retailers and food service professionals of Middle East and African region see it as an important event for their businesses expansions. The exhibitors were also benefited from the show as the first transit gateways to the seafood market in MENA region. About 49 trade enquiries were received at the show are separately listed in the concerned section of this Newsletter.

There were 15,432 visitors, 143 Exhibitors from 111 Countries. MPEDA participated in SEAFEX 2018 from 30th October to 1st November 2018 by taking a space of 72 sq. m. along with 5 co-exhibitors. M/s. Pure Imports & Exports, Andhra Pradesh; M/s. Arnav Fish International, Andhra Pradesh; M/s. United Marine Products, Mangalore; M/s. Fresh Catch Exports, Andhra Pradesh and M/s. Gadre Marine Exports, Ratnagiri. The Indian pavilion was located in Stand no. Z3-E55 at Hall no. ZAB3. MPEDA's participation in the show was organized by Mr. Premdev K. V. and Mr. Ram Adhar Gupta, Deputy Directors, MPEDA.

Seafood potential of MENA region

According to Euromonitor International, the fish and seafood market in UAE is expected to reach a value of AED 26.6 Billion (US$ 7.3 billion) by 2021. It is steadily growing since 2017 with a compound annual growth rate of 10.7%. The recent report reveals that the consumption will increase exponentially in near term as the market may absorb 1 billion new consumers due to rising disposable income, rapid urbanisation and a large and growing group of young consumers across the region.

The UAE has the fast growing seafood industry with 78 companies registered as specialist seafood importers and having 35 processing plants. Dubai and Abu Dhabi are the most preferred transit points for major airlines operating from South Asia to Europe and US continents. It is estimated that around 2 million meals are prepared every day to serve airline passengers and workers.

UAE as a seafood market

UAE has imported seafood worth USD 552.58 Million under chapter 03 during 2016. Seafood is imported into UAE from about 127 different countries.

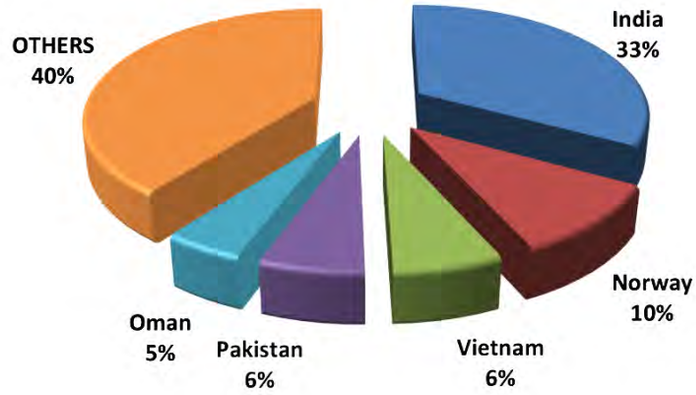
i. Countries exporting to UAE under chapter 03

India has been the top exporter to the region with a value share of 28.9% followed by Norway and Vietnam.

Indian exports under Chapter 03 to UAE accounts to USD 159.61 Million. Major suppliers of fishery products to UAE include Pakistan, Oman, Iran, Turkey, China, USA and Myanmar (Please see the list below).

Rank	Exporting countries	Imported value in 2016 (in million USD)
1	India	159.61
2	Norway	57.83
3	Vietnam	42.09
4	Pakistan	37.72
5	Oman	32.69
6	Iran, Islamic Republic of	20.72
7	Turkey	19.91
8	China	16.99
9	United States of America	11.86
10	Myanmar	11.56
	World	**552.58**

In 2016, the top ten supplying countries accounted for about 74% of total UAE seafood imports on a value basis.



Major seafood exporting nations to UAE

ii. Countries exporting to UAE under chapter 16

The top countries exporting to UAE under subheading 1605 (Crustaceans, molluscs and other aquatic invertebrates, prepared or preserved (excluding smoked)) are Vietnam, USA, France, Thailand and Canada (2016). The share of India is only 1.6%.

Countries exporting to UAE under subheading 1605		
Rank	**Exporting Countries**	**Imported value in 2016 (in US$ Millions)**
1	Viet Nam	3.01
2	United States of America	1.94
3	France	0.96
4	Thailand	0.87

5	Canada	0.81
6	Indonesia	0.68
7	Philippines	0.53
8	China	0.45
9	Japan	0.40
10	Russian Federation	0.33
14	India	0.21
	World	**12.42**

Under 1604 (prepared and preserved fish, caviar and caviar substitutes prepared from fish eggs), Thailand, Philippines and Italy are the major exporters to UAE and India ranks 21st among the exporting countries with a value share of 0.3 %.

Countries exporting to UAE under subheading 1604		
Rank	**Exporting Countries**	**Imported value in 2016 (USD Millions)**
1	Thailand	55.39
2	Philippines	5.91
3	Italy	3.39
4	China	2.55
5	Indonesia	2.29
6	United Kingdom	2.12
7	United States of America	2.05
8	Oman	1.40
9	Viet Nam	1.25
10	Japan	1.13
21	India	0.24
	World	**86.69**

iii. Product specific import item to UAE

The product specific import item to UAE with unit value for which India has good potential for exports

UAE (2017)				
SL. NO.	**HS CODE**	**PRODUCT DESCRIPTION**	**VALUE (USD in '000s)**	**UNIT VALUE (USD/KG)**
1	0306 17	Other Shrimps and prawns	199,124	7.36
2	1605 21	Shrimps and prawns not in airtight container	946	6.43
3	1605 54 00	Cuttlefish and squid	490	5.44
4	1604 20	Other prepared or preserved fish	3,780	4.28
5	0303 42 00	Yellowfin Tuna (*Thunnus albacares*)	402	3.68
6	1605 55	Octopus	478	15.41

7	1604 14 10	Tunas	89,322	4.31
8	0303 43 00	Skipjack or stripe-bellied bonito	316	1.60
9	1605 10 00	Crab	1982	22.02
10	1604 15 00	Mackerel	1335	3.08
11	1604 16 00	Anchovies	428	9.95
12	1604 13 10	Sardines, sardinella and brisling	6532	2.25

Frozen shrimp is the top item of import to UAE. Prepared and preserved products of tuna and other fishes and crab also enjoy good demand in this market.

At a 6-digit HS code level analysis, 'Other Shrimps and prawns' is found to be the major item imported to this market. In general, UAE is a major market for other shrimps and prawns under Chapter 03 followed by tuna and other preserved fishes under Chapter 16.

Indian marine product exports to UAE

The export of marine products to UAE during 2017-18 was 28,507 MT worth USD 186.68 million. The major items exported from India are frozen shrimp, chilled items, frozen fish and frozen cephalopods, which together constitute 98% of the total volume of fish and fish products. Item-wise exports to UAE are given in the table below.

ITEM - WISE EXPORT OF MARINE PRODUCTS TO UAE				
Q: Quantity in M T, V: Value in Rs. Crore, $: US Dollar Million				
ITEM		**2015-16**	**2016-17**	**2017-18**
FROZEN SHRIMP	Q:	11149	14142	19043
	V:	576.42	716.24	906.37
	$:	88.65	107.94	142.36
FROZEN FISH	Q:	2854	3084	2566
	V:	32.85	39.65	28.62
	$:	5.04	5.97	4.49
FR CUTTLE FISH	Q:	69	81	103
	V:	1.48	2.43	3.19
	$:	0.23	0.37	0.50
FR SQUID	Q:	2052	1497	1386
	V:	37.83	34.21	30.30
	$:	5.80	5.16	4.76
DRIED ITEM	Q:	19	164	156
	V:	0.39	1.25	1.27
	$:	0.06	0.19	0.20
LIVE ITEMS	Q:	3	6	4
	V:	0.17	0.29	0.25
	$:	0.03	0.04	0.04
CHILLED ITEMS	Q:	5251	5225	4871
	V:	215.21	221.33	196.87

	$:	33.21	33.36	30.94
OTHERS	Q:	361	430	377
	V:	18.59	21.62	21.55
	$:	2.86	3.27	3.39
Total	Q:	21758	24629	28507
	V:	882.95	1037.02	1188.42
	$:	135.87	156.29	186.68

Tariff rates of major products exported by India (2017)

Sl. No.	HS Code	Product Description	Tariff Rate MFN	Preferential Tariff
1	03061790	Other shrimps and prawns	0%	0%
2	03034300	Skipjack or stripe-bellied bonito frozen	5%	5%
3	03011190	Live Freshwater Fish	0%	0%
4	03034200	Yellowfin tunas (Thunnus albacares)	5%	5%
5	03038930	Ribbon fish	5%	5%
6	03038950	Pomfret (white or silver or black)	5%	5%
7	03038980	Croackers, groupers, flounders	5%	5%
8	03011900	Other live ornamental Fish	0%	0%
9	03049900	Surimi	5%	5%
10	030749(6 DIGIT)	Other cuttle fish and squid	5%	5%
12	16041410	Prepared and prepared Tunas	5%	5%
13	16041500	Mackerel	5%	5%
14	16041600	Anchovies	5%	5%
15	16042000	Other prepared and preserved fish	5%	5%
16	16052900	Other shrimps and prawns	5%	5%
17	16052100	Other shrimps and prawns not in air tight containers	5%	5%
18	16051000	crab	5%	5%
19	16055400	Cuttlefish and squid	5%	5%
20	16041310	sardines	5%	5%

Seafood exports from UAE

In 2016, UAE exported seafood worth USD 123.41 Million. The major export destinations were Egypt with 33.3% share, Vietnam with 22.2%, and Oman with 07.5% share. Major items exported from UAE include crustaceans in different forms, frozen fish and other fish in dried/salted or brine and molluscs in fresh, chilled or frozen forms.

Conclusion

Although India ranks first among the nations exporting raw seafood to UAE, the import ranking of India under Chapter 16 is on an average 18 only. India has the potential to develop as a topmost supplier of seafood in UAE market, especially for value-added and chilled products. In order to sustain our trade

Seafood samples displayed in MPEDA stall

A view of the MPEDA stall

MPEDA officials in the stall with visitors

relation with overseas buyers, frequent interaction with various Importers Associations, related government departments had been very effective. Such one-to-one contacts will provide feedback on the trade and regulatory requirements of the buying countries, which will enable us to take effective measures to increase the market base.

The participation in SEAFEX is important in market retention and further penetration, which assist trade negotiations in convincing the authorities and seafood buyers on our quality policy, traceability systems, environmental conservation and sustainability measures.

The seafood exporters/industrialists may further explore the possibility of re-processing and export from UAE to GCC and other major African markets in order to tap the additional benefit of zero tariff.

The proximity and well-established infrastructure facilities of UAE in terms of transhipment and reprocessing may further explored and utilized.

India should upgrade the infrastructure facilities in major airports to ease out the chilled and live fish business to UAE as the market is mainly concentrated on fresh/ chilled fish.

MPEDA recommends to have a continuing participation at SEAFEX Dubai with the aim of expanding the UAE market further in terms of value added and chilled seafood products.

India all set to become top exporter again

The shrimp exports data from latest Globefish report (4th issue, 2018) for 6 months (January to June) puts Ecuador as the top exporter of shrimps. It is followed by India and Vietnam. The details are given in the Table 1.

The production from Ecuador was higher than India during first 6 months in 2017 also. However, India overtook Ecuador in the yearly production. The harvests are more in India during July – December period. And hence, it is likely that India may retain its top rank in export supply once the total figures for 2018 are out.

Table 1. Export volume

Exporting Countries	Year (tons)	
	2016	2017
India	4,38,500	5,74,200
Ecuador	3,72,600	4,39,700
Vietnam	4,25,000	5,30,000
Indonesia	1,88,000	1,76,600
China	2,05,300	1,96,900

Exporting Countries	January-June (tons)		July - Dec 2017
	2017	2018	
Ecuador	2,12,700	2,42,700	2,27,000
India	1,78,400	2,41,200	3,95,800
Vietnam	1,37,100	1,48,200	3,92,900
Indonesia	83,200	95,100	93,400
China	88,900	85,600	1,08,000

World shrimp production

The estimated shrimp production from capture and culture fisheries (Source: FAO) is given below in Table 2.

Table 2. Shrimp production (2016 in tons)

Producers	Capture	Culture	Total production
China	13,04,015	20,11,692	**33,15,707**
India	4,20,724	5,21,269	**9,41,993**
Indonesia	2,83,943	6,36,755	**9,20,698**
Vietnam	1,67,500	6,33,427	**8,00,927**
Ecuador	4,209	4,22,000	**4,26,209**
Thailand	42,453	3,27,561	**3,70,014**
Argentina	1,78,520	-	**1,78,520**

Shrimp production from capture

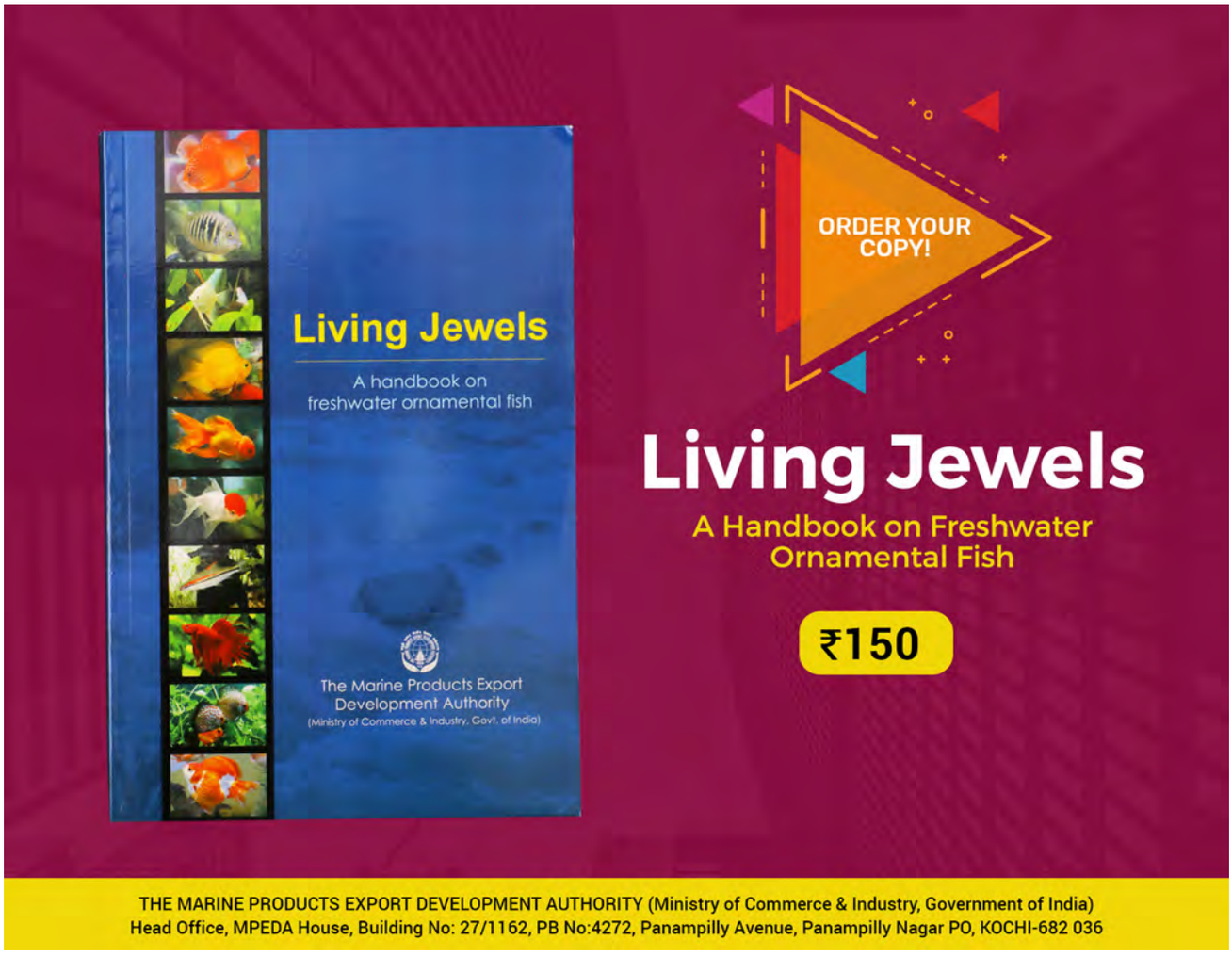
According to CMFRI annual data for 2017, the estimated landings of sea water shrimps in India was 4,12,261 tons.

Shrimp production from culture

The Global Aquaculture Alliance (GAA) forecast says that the 2018 output for Ecuador, Indonesia and Vietnam may reach nearly 5,00,000 tons, 5,50,000 tons and 6,00,000 tons, respectively, while Indian production may fall below 6,00,000 tons. Thai production is likely to be below 3,00,000 tons. These quoted figures make it clear that India and Vietnam will be having almost same quantity of shrimp production and may occupy the top positions other than China. The total shrimp production in capture fisheries in India during 2017 was 4,12,261 tons.

MARKETING NEWS

Exported value (in USD million) in 2017								
Sl. No.	Countries	HS code 030635 - Live, chilled cold water shrimps & prawns	HS code 030695 - Live, chilled Other shrimps & prawns	HS code 30616 -Cold-water shrimps & Prawns	HS code 030617- Other shrimps & prawns	HS code 160521- Shrimps & prawns not in airtight containers	HS code 160529- Shrimps & prawns in airtight containers	Total
1	India	9.35	2.25	14	4,629	114	205	4,973.60
2	Vietnam	0.03	5.37	167	2,202	651	733	3,758.39
3	Ecuador	0.00	0.00	367	2,671	9	5	3,052.00
4	China	0.00	81.79	71	905	695	492	2,244.79
5	Thailand	0.00	73.30	32	922	592	376	1,995.30
6	Indonesia	6.02	0.97	20	1,404	258	44	1,732.99
7	Argentina	0.00	0.00	0	1,200	0.113	0.005	1,200.12



Mass communication programmes to transform fishing trends

Mass communication at fishermen village in Visakhapatnam

With the goal of reaching out to many people, NETFISH has been conducting mass communication programmes on quality management and conservation using public address systems like microphones at harbours and sign boards and distribution of handouts. During September 2018, programmes were held at Vizhakhapatnam in Andhra Pradesh and Azeekkal in Kerala on the theme "*Save Juvenile Fishes for Sustainable Fishing*".

Fishers gathered around the mass communication van

In Andhra Pradesh, the programmes were conducted in and around Pudimadaka, Jalaripalem landing centres and Vizag harbour on September 27, 28 and 30 respectively, in association with member NGO District Fishermen Youth Welfare Association (DFYWA). The event was aimed at bringing awareness among the boat owners and crews of mechanized fishing vessels and motorized crafts to stop landing of under-sized Yellow Fin Tuna (below 5 Kg) for local trade.

The publicity campaign was carried out with a vehicle equipped with a microphone set as well as banners displaying information on preferred gears for Tuna fishing like hook and line and bigger mesh-sized nets, the price variation in comparison to size etc. Public announcements were done at various localities and handouts were distributed during the programme.

The programme could generate awareness among the stake holders not to catch under-sized Yellow Fin Tuna as it leads to resource and economic loss to the fishermen and the discussions made with the stake holders during the programme could trigger a positive change in the attitude.

The Mass Communication programme held at Kayamkulam harbour in Kerala on September 19

Mass communication programme at the harbour

involved fixing of a large sign board displaying the Minimum Legal Size (M.L.S.) notified by the Government of Kerala for 58 commercially important fishery items.

The sign board was fixed at the inside wall of the auction hall of the harbour, so that whoever comes to the harbour can have a good sight of it. Effective implementation of M.L.S. is one of the major prerequisites for marine fisher resource management and it should be emulated by all the maritime States in India.

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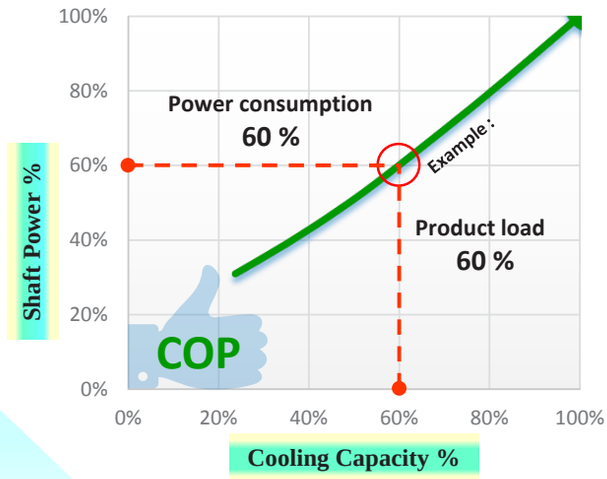

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Mobile Kiosk for value-added fishery products

Mr. K. S. Srinivas IAS, Chairman, MPEDA inaugurating the Fish Nutricart

Fishermen community in India is still at the lower end so far as socio economic development is concerned. The dwindling catch, seasonal fluctuations and adverse effect of climatic changes have all made fishing sector a less lucrative one and the condition of the traditional fishing families worse than ever.

Like in any other sector, it is the woman in a house who suffers the most in times of financial crisis as she is in charge of meeting the regular family expenses. Therefore, it is better to reach a family through the woman, especially when it is for providing a livelihood option for generating subsidiary income.

Keeping these facts in consideration and as a continuation of various activities for the livelihood improvement among fisher folk, NETFISH developed a mobile kiosk named as 'Fish Nutricart' with a view to empower ladies Self Help Groups (SHGs) by providing a means for their livelihood improvement.

Development of Fish Nutricart

The Nutricart was fabricated on a TATA SFC 407 Chassis at a cost of around Rs. 15 lakh. The body of the kiosk was built using stainless steel and galvanized iron and it was equipped with a four-burner stove, stainless steel racks and cabinets, SS Kitchen sink, inverter, power plug, lights, SS water tank of capacity 450 litres, hand wash facility at outside, waste water drain tank beneath the vehicle, etc.

This was the first-ever mobile kiosk exclusive for catering seafood in Kerala. The cart will be run by the ladies group, making available the fish-based products at major spots in Kochi.

The products include fish cutlet, fish ball, fish finger, fish samosa, fish biryani and prawn biryani, besides dishes made out of squid, crab and other indigenous fish varieties. NETFISH had launched this Nutricart, aimed at familiarizing quality seafood delicacies among

Handing over the MoU signed between NETFISH and Amrutha Activity Group

Ladies preparing the fishery products inside the Nutricart

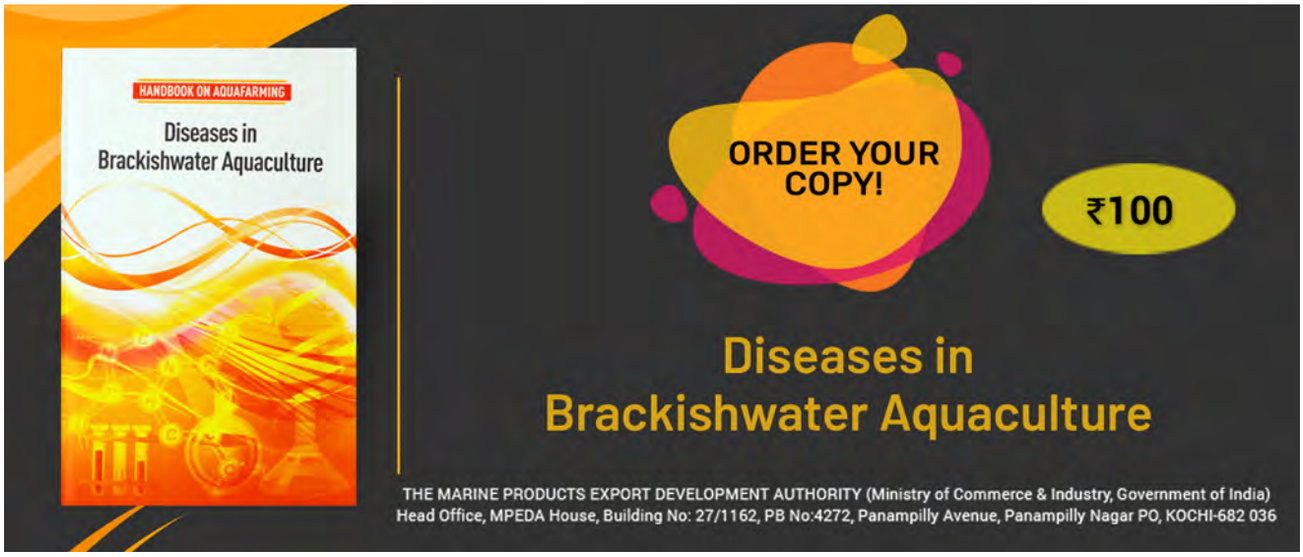
general public along with women empowerment. MPEDA Chairman Mr. K. S. Srinivas IAS inaugurated the cart on October 5 at MPEDA Head Office, Panampilly Nagar, Kochi.

Mr. B. Sreekumar, Secretary, MPEDA; Mr. Rama Shankar Naik, Commissioner of Fisheries, Andhra Pradesh; Dr. Joice V. Thomas, Chief Executive, NETFISH and Ms. Sunita Sajeev, member of Amrutha Activity Group, spoke on the occasion.

The vehicle was handed over to Amrutha Activity Group, a self-help group of women under Society for Assistance to Fisherwomen (SAF), after signing a MoU between NETFISH and the women group, at the function.

The Fish Nutricart

Inside view of the Nutricart



MPEDA attends "Shining Maharashtra"

Officials of MPEDA explaining MPEDA's activities to the visiting students

Dr. Avinash Dhakane, Municipal Commissioner, SMC and CEO, Solapur City Development Corporation Ltd., inaugurated the exhibition on on "Shining Maharashtra" held from September 26 to 28 at Solapur, Maharashtra by Sansa Foundation, Delhi. MPEDA, Regional Division, Panvel participated in exhibition.

The 15 sq. m. exhibition stall put up by Regional Division, Panvel displayed various activities of MPEDA along with, live animals of *L. vannamei*, Pangasius, GIFT Tilapia, Mangrove crabs, Ornamental fishes, Sea Bass etc. The stall also displayed various posters on Fish Exchange portal, MPEDA's Scheme Guidelines on assistance for Certification of Primary Production on *L. vannamei*, GIFT Tilapia and sea bass culture.

There were a total of 52 stalls, including 34 government organisations, at the exhibition. Mr. Naresh Vishnu Tambada, Assistant Director, Mr. Atul Raosaheb Sathe, Field Supervisor and Mr. Mangesh Mohan Gawade, Supervisor were present at the MPEDA stall.

People from all categories like small farmers, entrepreneurs, teachers and students of various schools and colleges from Solapur district and from all over the Maharashtra visited the "Shining Maharashtra" exhibition between September 26 and 28. It is estimated that more than 3,000 persons visited the MPEDA stall during these days. Out of these, 170 were farmers, scientists and teachers and there were students from 20 schools in Maharashtra.

Mr. Amar Sabale, Hon'ble Member of Parliament (Rajya Sabha) visited MPEDA's stall

During the exhibition officials of MPEDA explained the role of MPEDA in export of sea food and aquaculture products with the help of posters and live animals like *L. vannamei,* Pangasius, GIFT Tilapia, Ornamental fishes and Sea Bass. Brief information on culture techniques and economics of culture of above species were given to interested visitors, teachers and students. All visitors were very responsive to live fishes, crabs and shrimp

Visitors interacting with MPEDA officials during visit

displayed in the MPEDA stall. Pamphlets translated in vernacular languages on culture technology of GIFT Tilapia, *L. vannamei*, Sea Bass, Pangasius and Scampi were distributed to those who visited the MPEDA stall.

Mr. Amar Sabale, Member of Parliament (Rajya Sabha) visited MPEDA's stall on the last day (September 28). Officials of MPEDA highlighted farming of *L. vannamei* in saline affected soils with example of MPEDA's demonstration of *L. vannamei* farming in saline affected soils at Akiwat in Kolhapur district.

The officials also conveyed him the potential of saline affected soils in Maharashtra for culture of *L. vannamei* as well as cage culture of GIFT Tilapia and Pangasius in reservoirs.

Awareness Programme on US Seafood Import Monitoring Programme (SIMP)

Mr. P. Anil Kumar, Joint Director, MPEDA interacting with the participants at Bhimavaram

MPEDA organised a programme to make seafood exporters aware about the proposed US Seafood Import Monitoring Programme (SIMP) at Vizag, Bhimavaram and Nellore on October 10, 11 and 12.

The basic objective of the programme was to make the stakeholders aware about the importance of traceability in seafood supply chain to prevent Illegal Unreported and Unregulated (IUU) fishing and seafood fraud. Representatives from seafood processing plants, including East Godavari, West Godavari, Krishna, Visakhapatnam and Prakasam districts attended the programme.

Mr. P. Anil Kumar, Joint Director, Regional Division, Vijayawada was the key speaker of the awareness programme. He talked about the IUU fishing and seafood misrepresentation. He emphasized on the importance of seafood monitoring programme, species of concern to India under SIMP, procedures to be followed under SIMP, requirements for capture and culture seafood products export to US etc in detail. The technical session was followed by an open discussion to clarify the doubts and queries regarding SIMP. All the members actively participated in the discussion and many key points related to export were discussed.

The stakeholders were also urged to enroll themselves on the fish exchange portal developed by MPEDA. Exporters have requested MPEDA to organize refresher course on ELISA testing, especially on validation techniques. All the representatives appreciated the initiative taken by MPEDA and offered their full support to implement SIMP programme successfully.

The awareness programme on US SIMP organised by MPEDA at Bhimavaram on October 12 was coordinated by Dr. Pau Biak Lun, Assistant Director, MPEDA Sub Regional Division, Bhimavaram.

Dr. Biak briefly described about the US Seafood Import Monitoring programme to the audience. Dr. Anjali S, Joint Director of State Fisheries, West Godavari district,

Participants of the SIMP training programme at Bhimavaram

spoke about the importance of farm enrollment and its importance in traceability. She mentioned about the steps taken by State Fisheries department to streamline the aqua farming by declaring into different aqua zones.

She expressed her concern about the recent export rejections even after getting negative test reports for the consignments.

Mr. M. Shaji, Deputy Director, Regional Division, Visakhapatnam made an overview about the Seafood Import Monitoring Programme, stressing about the importance of data reporting and record keeping regarding the chain of custody of the fish or fishery products from the harvest to the point of entry into US.

Mr. P. Anil Kumar, Joint Director, Regional Division, Vijayawada was the key speaker in the session where 76 representatives from various seafood processing plants attended.

All That Needs To Be Known About SIMP

The global market is opening up now. It is highly competitive and quality conscious. So, Illegal, Unreported and Unregulated (IUU) fishing and seafood fraud jeopardize the health of fish stocks, distort legal markets, negatively impact consumer confidence, and unfairly compete in global markets with the products of seafood producers who comply with fishery regulations.

The Seafood Import Monitoring Program (SIMP) is the first-phase of a risk-based traceability program requiring the importer of record to provide and report key data from the point of harvest to the point of entry into U.S. commerce on an initial list of imported fish and fish products identified as particularly vulnerable to IUU fishing and/or seafood fraud.

SIMP establishes proper reporting and recordkeeping requirements to prevent IUU fishing and/or misrepresented imports of certain seafood products from entering U.S. commerce. The Seafood Import Monitoring Program requires additional data to be reported at the point of entry into U.S. commerce or retained by the importer of record for imported fish and fish products identified as priority species. January 01, 2018 is the mandatory compliance date for this rule. SIMP initially applied to seafood products of particular concern because the species are subject to significant seafood fraud as well as they are at significant risk of being caught by IUU fishing.

The National Oceanic and Atmospheric Administration (NOAA) lifted the stay on shrimp and abalone in SIMP on April 23. Shrimp and abalone compliance under SIMP will be mandatory by December 31. Therefore, it will be mandatory for foreign shrimp products to be accompanied by harvest and landing data and for importers to maintain chain of custody records for shrimp and abalone imports entering the U.S. by December 31.

FOCUS AREA

Awareness Programme on SIMP at Mangalore

Participants of SIMP awareness meeting at Mangalore

MPEDA Sub Regional Division, Mangalore conducted an awareness meeting at Mangalore on October 9 to update stake holders of Karnataka on implementation of SIMP Programme, in which 42 Processing / QC Technologists representing 30 Seafood Processing Plants in Karnataka region attended. During the awareness meeting, Mr. Asok Kumar, Deputy Director, MPEDA Mangalore, made a presentation on implementation of the SIMP. He also presented an overview of the development and issues in Karnataka region.

He told the processors that the collection of harvest and landing documentation for these priority seafood species need to be furnished to the importer of record. He has also elaborated on details and documents to be

The SIMP is not a labeling program, nor is it consumer facing. SIMP is an integrated programme that facilitates data collection, sharing, and analysis in an efficient manner among relevant US regulators and enforcement authorities in addressing IUU fishing and seafood fraud.

The data collected will allow these priority species of seafood to be traced from the point of entry into U.S. commerce back to the point of harvest or production to verify whether it was lawfully harvested or produced.

The collection of catch and landing documentation for these priority seafood species will be accomplished through the International Trade Data System (ITDS), the U.S. government's single data portal for all import and export reporting.

The information collected under this program is confidential. The importer of record will be required to keep records regarding the chain of custody of the fish or fish product from harvest to point of entry into U.S for a period of two years from the date of entry into U.S.

This SIMP programme is developed in such a way that permits all authorized agencies to enter, analyze, use, and verify the data while still protecting information consistent with statutory authorities.

NOAA and its fishery management partners already collect much of this information for many species for use in domestic fisheries management.

Also, at the border the FDA collects information on the identity of imported seafood products, harvested or farmed. Customs and Border Protection (CBP) is able to utilize its authorities at the border to enforce other U.S. agency requirements for imported seafood products.

Mr. S. Asok Kumar, Deputy Director elaborates SIMP

submitted to importer of record for onward submission into the U.S. government's single-window data portal called International Trade Data System (ITDS) for export of the priority species into US.

He further explained that the Importers of record are the U.S. entities taking responsibility for the import under U.S. Customs regulations and will be required to hold an International Fisheries Trade Permit (IFTP) issued by NOAA Fisheries.

The meeting has also discussed about 3-alpha identifier code, which is a unique taxonomic code of FAO for a more detailed classification of the species items and for sorting them out within each ISSCAAP group.

List of FAO 3-alpha identifier code for the priority species of SIMP furnished to the processors for necessary implementation.

Mr. Narayana, State Coordinator, NETFISH presented activities of NETFISH in the region at the meeting, especially training on hygienic handling and conservation.

The processors were told to make use of services of NETFISH to impart training to the pre-processing and processing workers in the plants in the region. Dr. Shassi, Assistant Director made a presentation on skill development training under PMKVY scheme and its requirements.

A similar programme was held at Panaji on October 10 for the benefit of stakeholders in Goa, in which 25 Processing / QC Technologists representing 14 Seafood Processing Plants in Goa region attended.

Mr. Asok Kumar, Deputy Director, SRD Goa, made the presentation on implementation of SIMP and also made a presentation of prospects and issues in the Goa region.

This was followed by a presentation on the activities of NETFISH in the region, especially training on hygienic handling and conservation by Mr. Narayana, State Coordinator, NETFISH.

Participants in both the meetings were requested to make use of other services of MPEDA like skill development training under PMKVY scheme, Fish Exchange Portal, MPEDA Newsletter, E-Statistics Package, New Catch Certificate Portal for EU, Non-EU, ICCAT certificates and other certificate of origin.

Highlights of marine fish landings in selected harbours of India during September 2018

K. A. NARAYANA, V.V. AFSAL, N.J. NEETHU AND JOICE V. THOMAS
NETFISH-MPEDA

NETFISH records the marine fish landings and boat arrivals occurring at the major harbours of India and this report presents the analysis result of harbour data obtained during September 2018. Data from marine fisheries contribute to our understanding of the marine environment and the analysis of fish populations are required for effective Fisheries management.

Data Collection & Analysis

The fishery data were collected on a daily basis, both from primary and secondary sources, by the Harbour Data Collectors stationed at selected major landing sites of the country (see Table 1). Approximate quantity of various fish species that are landed in a day at the harbour was obtained by eye estimation. The name, registration number and type of fishing vessels arrived at the harbour were also recorded. Data obtained were further evaluated using online applications and MS office (Excel) tools to arrive at species-wise, region-wise, state-wise and harbour-wise estimations. Data from 44 harbours belonging to 9 maritime states were obtained during the month which was analysed for this report.

Table 1. List of harbours and landing centres selected for data collection

Sl. No.	State	Fishing harbour
1	West Bengal	Deshapran
2		Namkhana
3		Raidighi
4	Odisha	Digha (Sankarpur)
5		Paradeep
6		Balaramgadi
7		Bahabalapur
8		Dhamara
9	Andhra Pradesh	Visakhapatnam
10		Nizampatnam
11		Kakinada
12		Machilipatnam
13	Tamil Nadu	Nagapattinam
14		Karaikal
15		Chennai
16		Pazhaiyar
17		Cuddalore
18		Pondicherry
19		Chinnamuttom
20		Mandapam
21		Tuticorin
22		Colachel
23	Kerala	Thoppumpady
24		Vizhinjam
25		Thottappally
26		Kayamkulam
27		Beypore
28		Sakthikulangara
29		Munambam
30		Puthiyappa
31	Karnataka	Tadri
32		Karwar
33		Mangalore
34		Honnavar
35		Malpe
36		Gangoli

37	Goa	Cutbona
38		Malim
39	Maharashtra	Ratnagiri (Mirkarwada)
40		Sasson Dock

41	Maharashtra	Harne
42	Gujarat	Veraval
43		Mangrol
44		Porbandar

Evaluation on fish landings

A total of 83,878.88 tons of marine fish landings was recorded from 44 landing sites during September 2018. The pelagic finfishes was the highest contributor during the month by registering a quantity of 30,605.87 tons (36%) and it was followed by shellfishes with an almost equal contribution of 30,033.30 tons (~36%). The demersal finfishes with a quantity of 23,239.71 tons could form only 21% of the total catch (Fig. 1).

More than 75% of Shellfish landing was comprised of molluscans, where squid recorded the highest quantity. In the case of crustaceans, the *Karikkadi* shrimp formed the major share.

The total catch was comprised of 110 varieties of marine fishery items, among which the top five contributors in the chronological order were squid, Ribbon fish, cuttlefish, Japanese threadfin bream and Indian Mackerel (Fig. 2). These 5 fishery items together formed 53% of the total catch. The other major contributors to the total catch were Reef cod, Leather Jacket & Croaker, each variety recording more than 2500 tons. The species which registered least landing during the month was the Blue Marlin, with a quantity of 0.20 tons.

Table 2. lists the quantity of various fishery items recorded during September 2018. Among the pelagic finfish resources, ribbon fish and Indian mackerel were the major contributors and in the case of demersal finfishes, it was Japanese threadfin bream and reef cods which contributed more. Major items among shellfish resources were squid and cuttlefish.

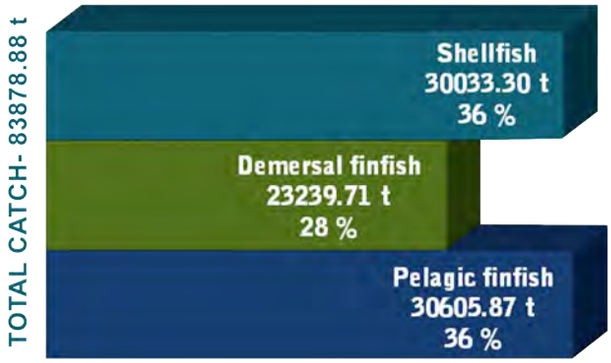


Fig. 1. Category-wise fish landings during September 2018

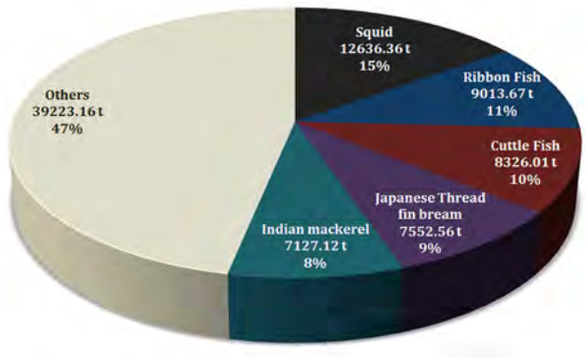


Fig. 2. Major fishery items landed during September 2018

Table 2. Category-wise landing of various fishery items during September 2018

Fish item	Quantity in tons	% of total catch
Pelagic finfish		
Ribbon Fish	9013.67	10.75
Indian mackerel	7127.12	8.50
Leather jacket	2818.11	3.36
Tuna	2439.98	2.91
Anchovy	1197.55	1.43
Horse mackerel	1197.47	1.43

Hilsa	1188.45	1.42
Scad	1177.59	1.40
Seer Fish	874.51	1.04
Bombay Duck	834.06	0.99
Indian Oil Sardine	821.25	0.98
Barracuda	444.97	0.53
Lesser sardines	233.44	0.28
Trevally	221.10	0.26

Herrings	211.13	0.25
Dolphin fish	193.50	0.23
Queen fish	166.86	0.20
Oriental Bonito	104.60	0.12
Sail fish	100.94	0.12
Mullet	96.74	0.12
Indian salmon	31.68	0.04
Silver sillago	29.50	0.04
Cobia	24.28	0.03
Marlin	18.29	0.02
Indian ilisha	15.90	0.02
Sea bass	12.67	0.02
Needle fish	3.20	0.00
Milk fish	3.20	0.00
Flat needle fish	2.63	0.00
Fusilier	1.50	0.00
Total	**30605.87**	**36.49**
Demersal finfish		
Japanese Thread fin bream	7552.56	9.00
Reef cods	4540.91	5.41
Croakers	2777.36	3.31
Pomfrets	1556.58	1.86
Snapper	1468.04	1.75
Lizard fish	1391.94	1.66
Cat fish	1280.58	1.53
Sole fish	825.23	0.98
Bull's eye	743.89	0.89
Eel	311.15	0.37
Pony fishes	213.95	0.26
Goat fish	203.62	0.24
Rays	112.44	0.13
Perches	67.19	0.08
Ghol	41.48	0.05
Moon fish	40.56	0.05
Black tip shark	27.01	0.03
Silver biddy	24.80	0.03
Parrot fish	18.67	0.02
Emperor Bream	17.91	0.02
Indian Halibut	11.12	0.01
Spine foots	7.60	0.01
Filefish	2.00	0.00
Yellow fin sea bream	1.25	0.00
Guitar fish	1.00	0.00
Sickle fish	0.45	0.00
Batfish	0.43	0.00
Total	**23239.71**	**27.71**
Shellfish		
Crustaceans		
Penaeid Shrimps	6196.585	7.39
Jawala	11.455	0.01
Sea Crab	1045.639	1.25
Mud Crab	76.05	0.09
Lobster	9.68	0.01
Total Crustaceans	**7339.409**	**8.75**
Molluscs		
Squid	12636.355	15.07
Cuttlefish	8326.007	9.93
Octopus	1731.53	2.06
Total Molluscs	**22693.892**	**27.06**
Total Shellfish	**30033.301**	**35.81**
Grand Total	**83878.88**	**100.00**

Region-wise landings

In September 2018, the maximum quantity of fish landings was recorded from the North West coast, where a total of 39,081.80 tons (47% of total catch) of fish catch was reported from the selected harbours of Maharashtra and Gujarat. The South West coast comprised of Kerala, Karnataka and Goa had contributed 33% of the total catch and thus held the second position. From the South East coast, landings were recorded from 14 harbours in Tamil Nadu and Andhra Pradesh which totalled to a quantity of 6,715.26 tons (8%) whereas along the North East coast 10,547.11 tons (13%) of fish catch was recorded altogether from 8 harbours of West Bengal and Odisha (Fig. 3). The five major fishery items which had contributed predominantly to the landings in each region are given in Table 3.

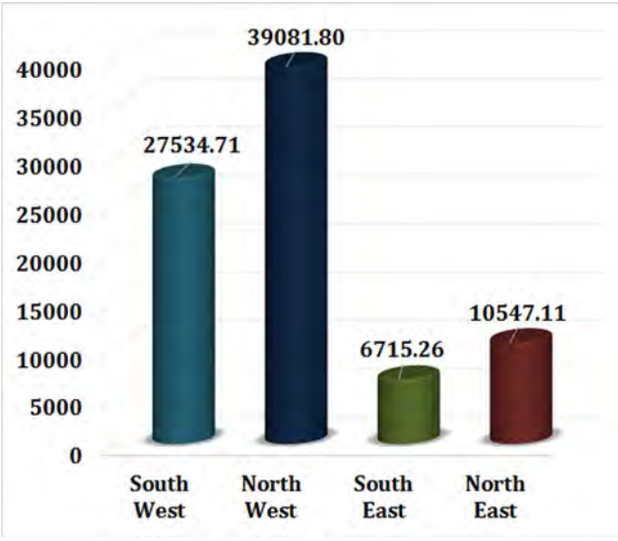


Fig. 3. Region-wise landings recorded during September 2018

Table 3. Major items landed in each region during September 2018

Item	Quantity in tons	% of total landings of the region
South West		
Indian mackerel	5923.60	21.51
Squid	4755.77	17.27
Japanese Thread fin bream	2370.12	8.61
Reef cod	2001.34	7.27
Cuttlefish	1547.16	5.62
North West		
Squid	7096.92	18.16
Ribbon Fish	7071.51	18.09
Cuttlefish	5708.79	14.61
Japanese Thread fin bream	5020.31	12.85
Reef cod	2449.38	6.27
South East		
Cuttlefish	850.13	12.66
Tuna	654.88	9.75
Squid	532.97	7.94
Sea Crab	362.61	5.40
Brown Shrimp	359.130	5.35
North East		
Croaker	1260.21	11.95
Hilsa	1157.92	10.98
Marine Shrimp (Karikkadi)	902.16	8.55
Bombay Duck	699.67	6.63
Sea Crab	542.61	5.14

State-wise landings

The maximum landing during September was recorded from Gujarat which was to the tune of 32122.18 tons, forming more than 38% of total catch (Fig. 4). This was followed by Kerala with 13,710.05 tons (16%) and then by Karnataka with a contribution of 11538.77 tons (14%).

The state which reported least landing during the period was Andhra Pradesh, where only 2,248.60 tons of marine fish catch was recorded.

The West coast states together formed nearly 80% of the total catch and the rest of the 20% only belonged to the East coast states. Among the East coast states, West Bengal was the state which recorded maximum landing.

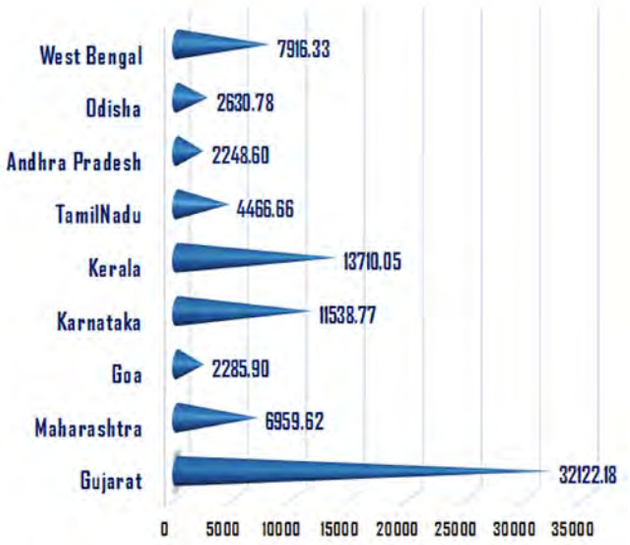


Fig. 4. State-wise fish landings (in tons) during September 2018

The major five fishery items which had contributed significantly to the landings in each state during September are given in Table 4.

Table 4. Major items landed in various states during September 2018

Item	Quantity in tons	% of total landings of the state
Kerala		
Squid	3471.18	25.32
Indian mackerel	2147.14	15.66
Japanese Thread fin bream	1710.60	12.48
Snapper	1293.70	9.44
Cuttlefish	1177.54	8.59
Karnataka		
Indian mackerel	2787.76	24.16
Reef cod	1531.64	13.27
Squid	1013.39	8.78
Leather jacket	872.66	7.56
Japanese Thread fin bream	659.52	5.72
Goa		
Indian mackerel	988.70	43.25
Reef cod	418.80	18.32
Squid	271.20	11.86
Horse mackerel	128.85	5.64
Little tunny	126.90	5.55
Maharashtra		
Squid	2189.92	31.47
Leather jacket	1118.40	16.07
Japanese Thread fin bream	719.81	10.34
Horse mackerel	476.06	6.84
Seer Fish	351.92	5.06
Gujarat		
Ribbon Fish	6790.00	21.14
Cuttlefish	5707.00	17.77
Squid	4907.00	15.28
Japanese Thread fin bream	4300.50	13.39
Reef cod	2236.40	6.96
Tamil Nadu		
Cuttlefish	787.39	17.63
Squid	467.85	10.47
Sea Crab	236.62	5.30
Tuna	232.57	5.21

Indian Oil Sardine	173.14	3.88
Andhra Pradesh		
Tuna	422.31	18.78
Brown Shrimp	190.21	8.46
White Prawn	181.63	8.08
Ribbon Fish	162.10	7.21
Sea Crab	125.99	5.60
Odisha		
Croaker	575.62	21.88
Marine Shrimp (*Karikkadi*)	354.40	13.47
Tuna	145.51	5.53
Sea Crab	143.11	5.44
Indian Oil Sardine	137.48	5.23
West Bengal		
Hilsa	1081.59	13.66
Croaker	684.58	8.65
Bombay Duck	628.11	7.93
Marine Shrimp (*Karikkadi*)	547.76	6.92
Sea Crab	399.51	5.05

Harbour-wise landings

Figures 5 and 6 represent the fish landings recorded during the month at the selected harbours of West coast and East coast respectively. Of the 44 harbours, Veraval harbour in Gujarat registered the maximum landing of 18,361.50 tons (22%) and it was followed by Porbandar harbour with a contribution of 9346.68 tons (11%). Along the East coast, Digha (Sankarpur) harbour registered the maximum landing, which was to the tune of 2958.11 tons, thus forming nearly 4% of total catch. The least quantity of marine fish catch was recorded from Mandapam harbour in Tamil Nadu (56.15 tons).

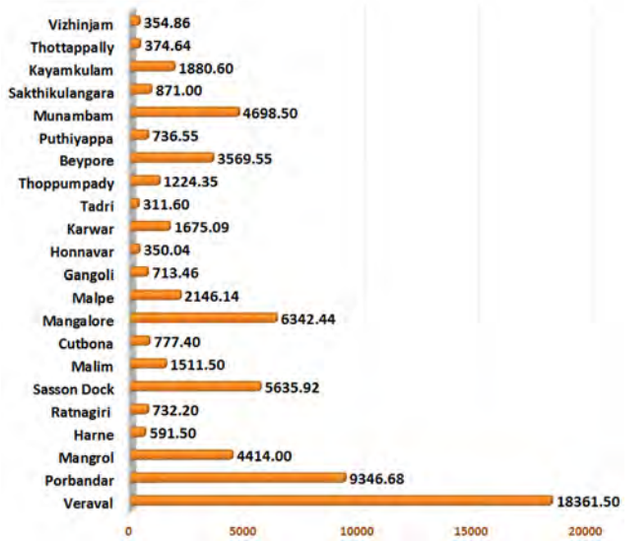


Fig. 5. Landings (in tons) recorded at harbours in west coast during September 2018

Fig. 6. Landings (in tons) recorded at harbours in east coast during September 2018

Appraisal of boat arrivals

A total of 29,333 numbers of boat arrivals were recorded during September 2018, of which the highest number of boat arrivals was recorded at Veraval harbour (3708 nos.). The Porbandar harbour with 3023 numbers of boat arrivals held the next position. About 80% of the fishing vessels which landed their catch at the harbours belonged to the category of trawlers and the remaining landings were by purse seiners, gill netters, long liners and traditional crafts.

Comparative analysis

Table 5 presents the comparison of data of September 2018 with that of previous months. The total fish catch had increased over the months, with more than 36000 tons increase during September than that of August. On analysing the catch compositions, pelagic finfish and shellfish resources were found contributing almost same quantity to the total landings during September. However, the share of pelagic finfish is found increased by 7% than the previous month and the shellfish resource share was decreased by 2%. Squid had registered as the topmost contributor among the various fishery items landed during the period and the Japanese thread fin bream could attain only the fourth position. In September, Gujarat had gained the top position among the states, moving Kerala to the second position. The Veraval harbour had continued in the topmost position among the harbours in terms of quantity of fish landed. The total number of boat arrivals recorded had increased in September when compared to that of previous months.

Summary

In September 2018, a total landing of 83,878.88 tons of marine fishery resources were recorded from the 44 major fishing harbours of India, wherein Pelagic finfish and shellfishes stocks contributed almost similar quantity. Considering the fishery item-wise landings, squid was the major contributor during the month. About 80% of the total catch recorded during September was from the West coast. Gujarat recorded maximum landing during the period and the Veraval harbour had registered the highest landing as well as the maximum number of boat arrivals.

Table 5. Comparative analysis of the data

	July 2018	August 2018	September 2018
Total Catch	23,957.27 t	47,118.88 t	83,878.88 t
Landing of Pelagic finfishes	11,037.42 t (46%)	13,585.64 t (29%)	30,605.87 t (36%)
Landing of Demersal finfishes	4,685.39 t (20%)	15,360.49 t (33%)	23,239.71 t (28%)
Landing of Shellfishes	8,234.45 t (34%)	18,172.75 t (38%)	30,033.30 t (36%)
Species recorded highest landing	Indian Mackerel (10%)	Japanese threadfin bream (16%)	Squid (15%)
State recorded highest landing	West Bengal (45%)	Kerala (26%)	Gujarat (38%)
Harbour recorded highest landing	Deshapran (20%)	Veraval (11%)	Veraval (22%)
Total Boat Arrivals	11,564	17,296	29,333

**Percentage of Total Catch*

Livelihood Development Training for Fisherwomen

NETFISH has organised a 'Hands on training programmes on preparation of Value added fishery products', aiming at skill development of fisherwomen and thus to improve their livelihood.

Two training programmes were organised in Karnataka in September – one at Udupi on September 21 and the other one at Suratkal on September 29. These programmes were organised in association with member NGO CARES and Mahila Mogaveera Sangha Fisherwomen's Association.

Mrs. Regha Gopal, State Level Skill Development Trainer, Mangalore, was the master trainer of the programme, in which 53 fisherwomen participated. Mr. Sathish Maben, Director, CARES, welcomed the gathering and Mr. Narayana K. A., State Coordinator, explained the objectives of the programme to the participants and gave a talk on fish quality management and personal hygiene. Guided by the resource persons, the participants prepared value-added products such as shrimp pickle, chutney powder from dried shrimps, fish ball and fish fingers.

A similar 'hands on training programme' was held at Karaikal, Tamil Nadu on September 27 and 28, in association with FPO, the member NGO. As many as 30 beneficiaries, including fish vendors and fisherwomen doing fisheries-allied activities, attended the training programme.

Mr. M. Muruganandham, Assistant Professor and Head, Department of Fish Processing Technology, Dr. MGR Fisheries College and Research Institute, was the resource person. The training programme covered both theoretical and practical aspects of preparation of value-added fishery products. Training manuals were also prepared and given to the participants.

Demo by the trainer in the programme at Suratkal

Value addition training at Karaikal

State Coordinator, NETFISH with the participants of the value addition programme at Udupi

Fish-borne parasitic zoonoses: status and issues in India

K. P. JITHENDRAN

Food-borne parasitic zoonoses (FBPZs) are human and animal diseases caused by helminthes and protozoans though the consumption of infected or contaminated meat, fish, plants and/or water. They pose great public health significance and socioeconomic problems in many countries and play great role in the transmission through food webs. In aquatic ecosystem, marine mammals, birds and fish act as reservoirs of potentially zoonotic pathogens to the human beings by way of contact and/or consumption of infectious pathogens.

Traditionally, fish-borne parasitic helminths (viz., *Chlonorchis, Opisthorchis, Metorchis, Diphyllobothrium, Anisakis* etc.) associated with the human consumption of fish products containing infective form of pathogens resulting in zoonotic diseases have been limited for the most part to populations living in low- and middle-income countries, but the geographical limits and populations at risk are expanding because of growing international markets, improved transportation systems, and demographic changes such as population movements.

The growing incidence of *Giardia, Encephalitozoon* and *Cryptosporidium* in fish and other marine animals is a recent phenomenon associated with growing urbanization and increased human activities. They may have been acquired via contamination of coastal waters by sewage, run off and agricultural and biomedical wastes. These indicate that organisms that can pose human health risks are widespread in marine vertebrates. Long distance migration, foraging of these animals, live and frozen fish trade and transboundary movement etc. are factors that favor transmission of disease across geographical boundaries. The intensification of aquaculture and globalization of the seafood trade have led to remarkable developments in the aquaculture industry accompanied with deterioration in environmental and health conditions. To understand the nature of health risks for marine animals and humans, increased attention is needed to establish the source of these zoonotic pathogens in marine environment. Awareness programme is needed to highlight the food-borne parasitic infections with public health hazards and food safety issues of seafood (fish and shellfish), which is a major export commodity in India.

Parasitic zoonoses of fish origin

About 18 million people are affected by fish-borne trematodes alone and are geographically confined to population living in low and middle income countries called as 'hot spots' of fish-borne zoonoses. They show a further expanding geographical limits and population at risk due to the growing international markets, improved transportation system, demographic changes etc. though the meat-borne zoonoses were more common in developed country and fish-borne zoonoses in developing country. Fish, shell fish and mollusc-borne parasitic zoonoses are clonorchiasis, opisthorchiasis, paragonimiasis, echinostomiasis, anisakiasis, angiostrongyliasis etc.

The major exposure routes include ingestion and introduction of organisms through open wounds or abrasions. More specifically, ingestion includes consumption of raw or under-cooked infected fish tissue, ingestion of fish tissue contaminated with faeces from infected fish, and ingestion of water harboring infectious organisms. Dermal exposure includes introduction of infectious agents into open wounds or abrasions through handling infected fish or infected water. As far as aquatic environment is concerned, fish-borne zoonoses can be classified under – (i) Fish-borne zoonoses: parasite undergoes some stages of development in fish/shell fish, (ii) Crustacean-borne zoonoses: parasite undergoes some stages of development in crustaceans and, (iii) Vegetable-borne/water-borne zoonoses: mainly by mechanical contamination of infective parasitic stages

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on vegetation (weeds, lotus stem etc).

The zoonotic parasites of fish origin also vary from freshwater, brackish water and marine ecosystem; host species etc. to a large extent. There is complete lack of priority for parasites of zoonotic significance, though some parts of the country face these problems. Food safety issue is a growing concern especially in export sector as majority of the fish products are being exported as frozen items. A single factor responsible for fish-born zoonoses could be lack of hygiene (poverty, lack of personal hygiene, scarcity of potable water, consumption of raw or undercooked food) and/or favourable climatic condition for parasite growth and transmission. Many zoonotic parasites enter human by way of consumption of raw aquatic vegetation/tubers etc. In India, food-borne zoonosis in general, especially the fish-borne in particular, are comparatively very less prevalent than in South East and Far East countries mainly because of the traditional culture of cooking and serving. However, eating raw or undercooked fish, crustacean, snail etc. is a delicacy in certain communities, and people. The incidence of helminthozoonosis can be minimized substantially, if people are provided with clean drinking water and hygienic living conditions. Besides, people need to be made aware and educated of risks of infection by way of undercooked fish / crab. Anisakis occur in the visceral cavity and surrounding tissues of many marine fish species. Human consumption of fish products containing these parasites can result in the zoonotic diseases anisakiasis.

The future impact of these fish-borne zoonotic parasites may be linked closely to the expected growth of aquaculture in Asia. However, there is disagreement on the relative importance of pond cultured fish versus wild caught fish in the epidemiology of human infection.

Plant and water borne parasitic zoonoses

Plant and water-borne parasitic zoonosees are fasciolopsiasis, fascioliasis, schistosomiasis, cryptosporidiosis and giardiosis. *Cryptosporidium* is typically a water-borne disease and the survival in seawater and the role of invertebrate as reservoir has been demonstrated.

Emerging fish-borne parasitic zoonoses

Some of the emerging FBPZs are *Heterophyes, Gnathostoma, Entamoeba,Balantidium* and microsporidium (*Encephalitozoon*) infection. Both marine mammals and birds act as reservoir for many potentially zoonotic protozoans infections (*Giardia, Cryptosporidium, Encephlitozoon* and *Entamoeba*).

Role of food habits

Fish-borne and meat-borne parasitic zoonoses are also endemic in many Asian countries that have related traditional cooking styles. In addition, an array of freshwater and brackish-water fish and wild animal

Ready to eat fish and other aquatic animal products in super market outlets

Ready to eat fish and other aquatic animal products in super market outlets

Largely raw or semi-cooked/processed delicacies like 'sushi' and other meat products on dining table

meats, which are important sources of infection with zoonotic parasites, are served as *sushi* and *sashimi*

in rural areas of Japan (Fig. 1-3). Despite the recent increase in the number of travellers to areas where these zoonoses are endemic, travellers and even infectious disease specialists are unaware of the risk of infection associated with eating exotic ethnic dishes. Because of the worldwide popularization of Japanese cuisine, the traditional Japanese fish dishes *sushi* and *sashimi* that are served in Japanese restaurants and sushi bars have been suspected of causing fish-borne parasitic zoonoses, especially anisakiasis.

Ligula intestinalis: The plerocercoid of the pseudophyllidean cestodes *Ligula* and *Schistocephalus* occur in the body cavity of freshwater fish commonly roach (*Rustilus*) and sticklebacks (*Gasterosteus*) respectively. Adults are found in the intestine of piscivorous birds. Compared with the mass of the fish plerocercoid tissue may be massive. Echinostomes are naturally occurring parasites in the intestine of a variety of mammalian and avian hosts. Humans are accidental hosts, the acquisition of echinostomiasis being associated with the food habits of consumption of raw or inadequately cooked mollusks, fishes etc. Many of these diseases are also zoonoses, some major and others potential.

Role of aquatic organisms

Marine zoonotic infections in humans result from consumption of contaminated edible tissues or products of seafood or, to a lesser extent, from physical contact with contaminated seafood. Across the world, over 50 species of helminth parasites from fishes, crabs, crayfishes, snails, and bivalves are known to produce human infections.

Most helminth zoonoses are rare and invoke only slight to moderate injury; however, some are more prevalent and pose serious potential health hazards. Most of the seafood zoonoses across the world occur along coastal regions, where seafood products are commonly consumed. Continuing improvements in transportation, technology, and food handling, however, allow fresh seafood to be shipped throughout the world; thus, the potential for acquisition of parasitic infections from marine products is not limited to coastal populations.

Although the number of documented cases continues to increase, the overall risk of human infection is slight. The increasing exploitation of the marine environment by humans, changing dietary habits incorporating "natural" seafood dishes (eg, sushi and sashimi), and tendency to reduce cooking time when preparing seafood products – all are factors that increase the chances of becoming infected with these parasites. Also, an influx in international trade of food items, particularly of the crustaceans, fishes etc., which may be contaminated with the infective stages of the trematodes, from the disease endemic countries to distant continents may contribute a potential health hazard for the population living in the 'sanitized' world.

Role of immigrants

Paragonimiasis is endemic in Aisa, African and South American countries and about 300 million people are at risk. In Japan the disease is re-emerging since 1980, due to the increased number of immigrants.

Role of migratory animals

Considerable evidence indicates that migratory birds and animals can contribute to the global spread of infectious agents in a spatial manner analogous to humans traveling in aircraft. Water fowls usually occur in large numbers, can migrate long distances, frequently graze and defecate in water, and are in fact protected by environmental laws in many regions where they have unlimited access to the surface waters used as drinking water.

Perspectives for control

Even after 60 years after Stoll wrote about "This wormy world", the prevalence of intestinal worms in human populations remain virtually unchanged. Helminth diseases, in general, are diseases of poverty, and are associated poor sanitation. These infections tend to decline with increased economic development.

> CONTROL OF ZOONOTIC FISH PARASITES IS A MULTIFACETED TASK DUE TO COMPLEX NATURE OF THE INTERACTION BETWEEN HOST, PATHOGEN AND ENVIRONMENT IN AQUATIC ECOSYSTEM.

Any approach towards effective control measures against meat/fish-borne zoonotic parasite should focus on the knowledge of various factors responsible for transmission and occurrence. Control of zoonotic fish parasites is a multifaceted task due to complex

nature of the interaction between host, pathogen and environment in aquatic ecosystem.

A central point towards the control of fish-borne zoonoses is overall hygiene and continued awareness among people about these infections. Proper education, hygienic living conditions, adoption of strict self-hygiene, habit of eating properly cooked food, use of clean water for drinking and bath particularly those whose trades compel them to be in constant and close contact with fish and shell fish, viz., fishing, culture, trading and processing activities etc. are important.

There is no strong and recent database on the fish-borne parasitic zoonoses in India though many text books on zoonoses have been published over a period of two decades. Hence the endemic areas of zoonotic infections of fish origin should be revisited to update the present status of each disease in both fish as well as man. Apart from lung flukes of human in North Eastern Hill (NEH) region, most other diseases need reappraisal. More importantly, culture of fish and shell fish in hygienic environment and free from sewage is also necessity to ensure food safety for fish and fishery products.

Strategies for prevention and control

Trends in the global parasitic infections soil-transmitted nematode infections show a decline over the last couple of decades as against the food borne parasitic zoonoses. The majority of human cases of fish borne or other food borne parasitic infections can, generally, be easily be treated by anthelmintic drugs after an accurate and early diagnosis has been established. Hence the challenge for helminth-control programmes today is more operational than medical and will depend on its ability to reach the poorest and often least accessible sections of the community.

TRENDS IN THE GLOBAL PARASITIC INFECTIONS SOIL-TRANSMITTED NEMATODE INFECTIONS SHOW A DECLINE OVER THE LAST COUPLE OF DECADES AS AGAINST THE FOOD BORNE PARASITIC ZOONOSES.

There is complete lack of priority for parasites of zoonotic significance, though some parts of the country face these problems. Food safety issue is a growing concern especially in export sector as majority of the fish products are being exported as frozen items.

The US Food and Drug Administration (USFDA) recommend preserving fish for raw consumption by storing it at less than -35˚C for 15 h or at less than -20˚C for 7 days. Similarly, according to the European Union Hazard Analysis and Critical Control Points (HACCP), marine fish for raw consumption should be frozen at less than -20˚C for more than 24 hrs.

The risk of infection by eating aquatic products is higher in countries where such legal regulations have not been implemented. For example, a country like China has 1.3 billion peoples of about 56 nationalities. So the task of controlling zoonotic disease is gigantic.

However, regular epidemiological survey, enhancement of food safety by implementing strict quarantine techniques and detectable methods for pathogens at production, processing, distribution and marketing stages. Change of peoples unhealthy eating habits particularly for some ethnic groups need to be addressed.

Conclusion

Parasitologists are confronted with complex problems of parasitic diseases in a rapidly changing world. Changes in human ecology and the impact of global climatic changes on parasitic systems have raised a serious voice of concern all over the world. Added to that, the food-borne parasitic zoonoses have emerged as a major public health problem in many countries, posing serious threat to human and animal health.

Increased thrust is required to control parasitic infections both in conventional slaughter animals and in aquatic animals/sea food in view of the increased production of cultured fish, and the need for hygienic aquaculture practice and processing of fish and fish products for human consumption.

Further, there is also a need for the establishment of a national network of aquatic parasitologists and a national surveillance system for parasite zoonoses of fish origin and their distribution in the country.

Establishment of national surveillance system for parasitic zoonoses of fish origin could be considered for addressing food safety issues and augmenting the research programme in this direction.

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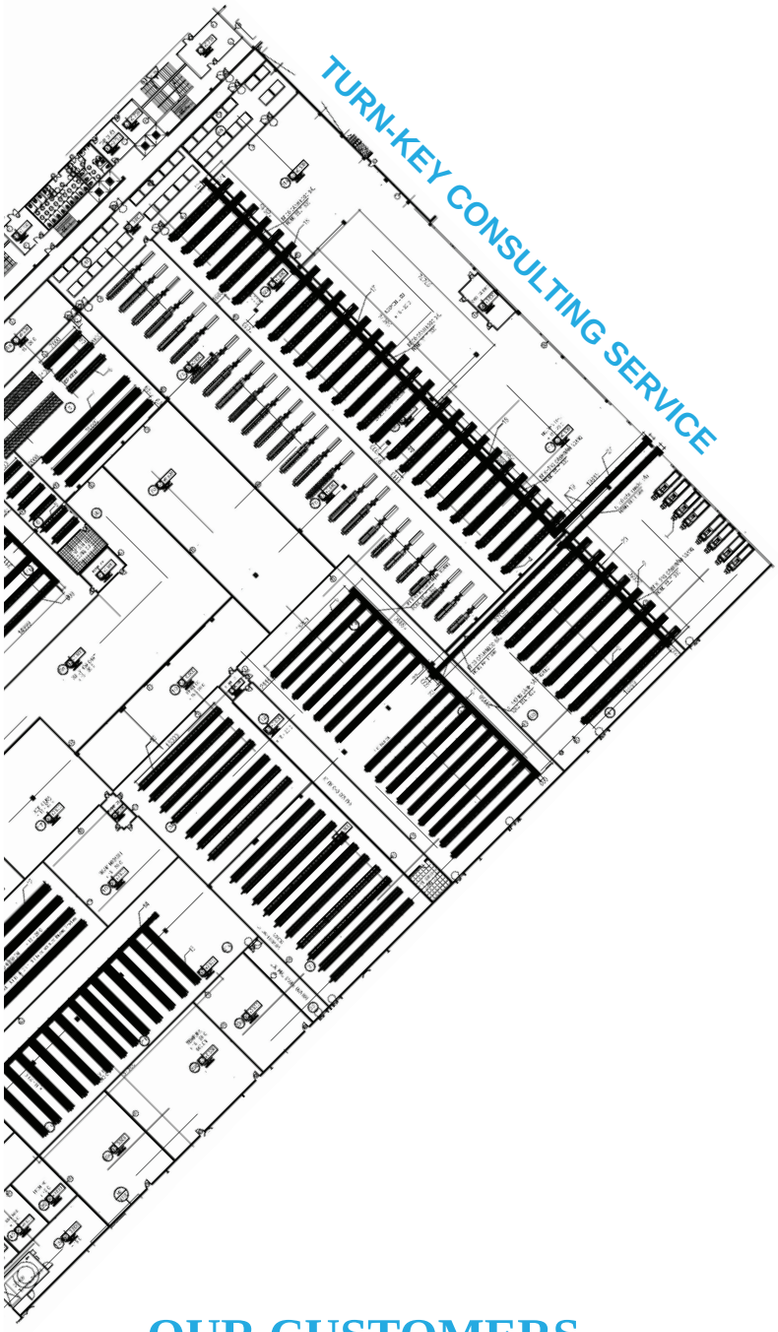

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Farmers Meet on Eco-friendly and Sustainable Shrimp Farming

Inauguration of the Farmers Meet

The Regional Division Valsad of MPEDA organized a Farmers' Meet on Eco-friendly and Sustainable Shrimp Farming for farmers of Valsad district on September 20 at Rajiv Gandhi Hall, Zilla Panchayat, Valsad. A total of seventy participants from Hingraj, Kosamba, Dantikakwadi, Palsana, Bhagal, Malvan villages attended the meet, which discussed the emerging problems in shrimp culture.

In his welcome address, Mr. Maruti D. Yaligar, Deputy Director explained the importance of setting up of on-farm shrimp nursery to overcome the problems of diseases. Nearly fifty on-farm nurseries have been set up by Bharuch farmers and in Katpore alone, there are 32 nurseries. None of these nurseries are facing any disease problems and their production is 10 to 12 MT /crop, he has pointed out.

Mr. Narendra J. Tandel, President, Gujarat Aquaculture Farmers Association, inaugurated the farmers meet and advised the farmers to adopt Better Management Practices(BMP) developed by MPEDA to overcome the disease problems during culture. Discipline need to be maintained in farming for better results, he said.

Mr. Samir, Asst. Director of Fisheries, Valsad gave an overview about the activities of Fisheries Department in Gujarat. Mr. Bhagvanbhai, President, Valsad Aquaculture Farmers Association, advised the farmers to take up culture in a scientific and eco-friendly manner.

Mr. Saji Chacko, Vice President, M/s. On-away Aquaculture, Mendhar, briefed about the past and present status of shrimp farming in Gujarat and explained the importance of bio-security in shrimp farming.

Technical session began with a presentation by Mr. Yaligar on Heterotropic Auto-recycling Aquaculture Technology (HAAT) developed by MPEDA-RGCA to control disease problems and suggested to stock only SPF seed for the success of shrimp culture.

Mr. Samir, Assistant Director of Fisheries, Valsad explained about the Coastal Aquaculture Authority license and its importance in shrimp farming, guidelines, CAA license application etc. and urged the farmers to apply for renewal of CAA license without any delay.

Mr. Razak Ali, Assistant Director explained about the MPEDA's new scheme – Moving Towards Certification and Assistance for certification of primary production and Assistance to societies.

He also explained the step-by-step method for Farmers Enrollment on Fish Exchange Portal and its uses and benefits. He also briefed importance of online enrollment of farms with MPEDA.

Mr. Bhavin M. Gheravara, Field Supervisor talked about the adoption of code of practices on antibiotic-free shrimp production and suggested the farmers not to use any banned antibiotics in shrimp farming.

Welcome address in Farmers Meet by Mr. Maruti D. Yaligar, Deputy Director, MPEDA

Mr. Jayanti, a progressive shrimp farmer from Bharuch district, shared his experience about on -farm shrimp nursery and his grand success in shrimp farming continuously for the last three years.

During the discussion hour that followed, the doubts raised by the farmers were cleared by the officials of MPEDA. The Farmers' Meet ended with the vote of thanks proposed by Mr. Razak Ali, who had congratulated the farmers of Gujarat for producing high quality and antibiotic-free shrimp for export.

Another session on the same theme was held from August 27 to 31 by the Regional Division, Valsad at Sachin Community Hall, Sachin, Surat for the benefit of the farmers in the district, in which 100 trainees reported for the training programme on the first day.

After registration of the trainees, Mr. Maruti D. Yaligar welcomed the participants and inaugurated the training programme. He explained the purpose of conducting the training and role of MPEDA for development of shrimp farming and requested the trainees to attend the training regularly.

After the inaugural session, officials of MPEDA engaged classes on various technical aspects. Mr. Maruti D. Yaligar and Mr. Bhavin Gheravara delivered lectures on introduction to shrimp farming and role of MPEDA on eco-friendly and sustainable shrimp farming, identification and life cycle of shrimp and pond preparation.

On August 28, Mr. Razak Ali, Assistant Director and Mr. M. A. Patil, JTO (AQ) delivered lectures on site selection and farm construction, seed selection, packing, transportation, acclimatization and stocking and water quality management.

Next day, the trainees were taken for field visit to shrimp farm of Mr. Rohanbhai Patel at Aahu Sultanabad village in Choryasi taluk of Surat district. Mr. Maruti D. Yaligar and Mr. Razak Ali led the field visit.

The practical aspects consisting of farm construction, management, bio-security measures, Good Management Practices (GMPs) and use of field equipment for testing of various water quality parameters were explained to trainees. Mr. Rohanbhai, the farm owner, explained his experience and Vannamei shrimp culture method to the trainees.

On August 30, Mr. Maruti D. Yaligar and Mr. Bhavin delivered lectures on land leasing policy and procedure for submission of application to the District Collector or the Department of Fisheries for allotment of government land for development of shrimp farming, uses of Pro-Biotic and abuse of antibiotics in aquaculture, harvesting and post-harvest management, marketing and HACCP in aquaculture.

Participants attended Farmers Meet

Officials of MPEDA led classes on remaining important technical aspects listed for the programme on August 31, the last day of the programme.

Mr. Maruti Yaligar and Mr. Bhavin talked about diseases prevention and control, Aquaculture Authority guidelines and how to apply for license, *L. vannamei* culture and bio-security measures and diversification of aquaculture. Examinations were held for the trainees.

The training concluded with distribution of certificates to all the 100 trainees, who successfully completed the training programme. Mr. Bhavin welcomed the participants and invitees.

Mr. Maruti Yaligar distributed the certificates to successful trainees and delivered valedictory address. Mr. Bhavin M Gheravara proposed the vote of thanks.

Training Programmes for Shrimp Farmers in Uttarkannada

Farmers of Belamabar and Aversa village of Ankola taluk in Uttarkannada district were troubled by diseases occurring within one month of stocking the seed of *L. vannamei*, which was brought from shrimp hatcheries in either Tamil Nadu or Pondicherry.

A three-day training programme was held for 20 farmers from these areas to counter the outbreak of diseases. Dr. V.N. Nayak, former professor of Marine Biology, Post Graduate Centre of Karnataka University, Karwar and Dr. D. Chandrakanth, Assistant Professor, Research and Information centre (Marine) Department of State Fisheries, Ankola led the training programmes.

In his inaugural address, Dr. Nayak stressed on the importance of cooperation and exchange farm operation among the farming community for successful harvests. Later, he elaborated on biology of shrimp and other cultivable species like crab, scampi common carp.

Dr. Chandrakanth spoke on water quality management as well as feed and feed management with reference to their shrimp farm and also shared the experience gained in the culture ponds with regard to water, soil and feed probiotics.

Mr. Vijaykumar Yaragal, Deputy Director, Mr. G. Ramar and Mr. S. M. Shirodkar, Junior Technical Officers, led classes on site selection of shrimp farms, construction of the shrimp ponds with special focus on water controlling structures, pre-stocking management, seed selection, seed stocking protocols, detail of water parameters, shrimp health management, banned antibiotic in aquaculture farms, protocol of harvest management.

Field Visit

A field visit was organised, on the second day of the training programme, to M/s. West Coast Aquaculture (P) Ltd., Baad village. The participants of the programme were explained about automatic feeder, installation and operation of sludge pump in P. line ponds, importance of biosecurity measures such as bird fencing, crab fencing, tyre dip, hand wash, CCTV camera and solar energy production.

Mr. Deepak Nayak, a progressive farmer from Hadwad village, was invited as guest for the valedictory function. In his address, he explained the importance of enrolment of shrimp farms with MPEDA for easy traceability of material harvest to streamline export since several vessels have been rejected due to the presence of the banned antibiotics. He also distributed the participation certificates and stipend to the trainees. Mr. G. Ramar, Junior Technical officer, proposed the vote of thanks.

Another three-day training programme was held at Holanagadde village, Kumta taluk, Uttarkannada district on the basis of a request placed by Mr. Vishnu Patger, Secretary of M/s. Aghanashini Organic Aqua Farmers Welfare Society, in which 20 farmers from Holanagadde

Class by Mr. S. M. Shirodkar, JTO, MPEDA

and Masoor villages attended. The programme, held from September 18 to 20, was inaugurated by Mr. Patger.

Mr. Vijayakumar Yaragal, Deputy Director, SRD, Karwar addressing the farmers

In his inaugural address, Mr. Patger said that during the Nineties, stocking of tiger shrimp was the only cultivable species in the brackish water and since it was harvested without much problems, the sector witnessed much investment. This was affected with the outbreak of the white spot syndrome virus in 1995, with many farmers incurring heavy losses. He further emphasized that the farmers should understand the ecological and carrying capacity of their farms with reference to water source without thinking about financial gains alone.

Mr. Yaragal, Deputy Director and Mr. Ramar, Junior Technical Officer led classes here too on site selection of shrimp farms, construction of the shrimp ponds with special reference to water controlling structures, pre-stocking management, seed selection, seed stocking protocols, detail of water parameters, shrimp health management, banned antibiotic in aquaculture farms and protocol of harvest management.

Dr. N. V. Nayak addressing the farmers

On the second day of the programme, the participants were taken to Mr. Deepak's shrimp farm, located at Harwad village and they were explained about the farm operations. Mr. Deepak Nayak is a successful shrimp farmer who has adopted the Best Management Practices and has shared his experience with trainees and cleared their doubts. The trainees were later taken to the MPEDA Seabass demonstration farm of Mr. Rajendra Patnekar at Harwad to see the farm operations. Mr. Vishnu Patger distributed the participation certificates and stipend to the trainees. Mr. Ramar proposed the vote of thanks.

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SC/ST Training Programme on "Eco-friendly and Sustainable Shrimp Farming"

Mr. Maruti D Yaligar, Deputy Director with the trainees during the visit to the Shrimp farm of Mr. Jitubhai, Barbodhan

The Regional Division, Valsad organized a five days' training programme on "eco-friendly and sustainable shrimp farming" at Barbodhan village in Olpad taluk of Surat from August from 20 to 24 for SC/ST candidates in the district. The objective of the training programme was to promote shrimp farming practice in coastal villages of Surat, in which 22 trainees attended.

Mr. Razak Ali, Assistant Director, welcomed the participants and inaugurated the training programme. He explained the purpose of conducting the training and role of MPEDA for development of shrimp farming and requested the trainees to attend the training regularly. Mr. Bhavin M Gheravra proposed the vote of thanks.

After inaugural session, officials of MPEDA led classes on various technical subjects. Mr. Razak Ali and Mr. Bhavin talked on introduction to shrimp farming, role of MPEDA on eco-friendly and sustainable shrimp farming, identification and life cycle of shrimp, site selection and farm construction.

On the second day, Mr. Maruti D. Yaligar, Deputy Director and Mr. Bhavin talked about pond preparation and seed selection, packing, transportation, acclimatization and stocking and water quality management.

On August 22, the trainees were taken for field visit to shrimp farm of Mr. Jitubhai Patel in Barbodhan village. Mr. Maruti Yaligar and Mr. Bhavin led the field visit. The practical aspects consisting of farm construction, management, bio-security measures, Good Management Practices (GMPs) and use of field equipment for testing of various water quality parameters were explained to trainees. Mr. Jitubhai, the farm owner, explained his experience and Vannamei shrimp culture method to trainees.

Next day, Mr. M.A. Patil, Junior Technical Officer and Mr.

Bhavin talked about land leasing policy and procedure for submission of application to the District Collector or Department of Fisheries for allotment of government land for development of shrimp farming, uses of Pro-Biotic and abuse of antibiotics in aquaculture, harvesting and post-harvest management, marketing and HACCP in aquaculture.

Mr. Razak Ali, Assistant Director, MPEDA delivering inaugural address

Officials of MPEDA engaged classes on remaining important technical aspects on August 24. Mr. Maruti Yaligar delivered a lecture on diseases prevention and control, Aquaculture Authority Guideline and how to apply for license.

Mr. Bhavin delivered lecture on *L. vannamei* culture and bio-security measures and diversification of aquaculture. Examinatons were held for those who attended the training sessions.

Certificates were distributed to all 22 trainees by Mr. Maruti Yaligar, who have successfully completed the training programme.

Hatchery Operators' Meet in Andhra Pradesh on Antibiotic-free Shrimp

Antibiotics are something new to shrimp hatcheries. They are frequently used to check diseases. But this is often proving to one of the potential sources for antibiotic residue in grow out farms.

The antibiotic residues in shrimp in grow out farm will lead to bacterial resistance to antibiotics and emergence of virulent bacterial strains. This may contribute to disease incidence in grow out farms and lead to use of antibiotics during grow out phase. Of late, the use of antibiotics in hatcheries has been causing concern as the main contribution factor to increased detection and rejection of export consignments. That has led to the need to bring down detection level in hatcheries to zero instance and convert all hatcheries in India to antibiotic-free status.

With this aim in mind, MPEDA has organised a programme on "Production of Healthy Shrimp PL Free of Antibiotics" in association with All India Shrimp Hatchery Associations (AISHA) and Society for Aquaculture Professionals (SAP) Chennai, Ongole and Kakinada on September 24, 26 and 28.

Right now, around 10-20% of the hatcheries are producing PL without antibiotics. In the present scenario, hatchery technicians with little scientific background are coming up because of many years of experience in hatchery operation. These technicians are paid on the basis of the number of PL produced or sold. The programme came up with suggestions during the interaction session to encourage hatcheries to reduce use of antibiotics.

Technical presentations by resources persons were made during the programme on a variety of subjects like Bacteriophage-based control of vibriosis in shrimp hatcheries, a balanced health approach for shrimp larviculture is the best alternative to antibiotics, microbial and health management in shrimp hatchery, with an antibiotic replacement objective and the need to stop using antibiotics in shrimp hatcheries.

As many as 237 stakeholders, including hatchery operators (own/leased), technical persons on hatchery, reputed pharmaceutical persons, officials from SFD and MPEDA, participated in the programme.

Training programme in 'Adoption of BMPs in Shrimp Culture and Species Diversification in Aquaculture'

Inauguration of training programme, L to R: Mr. Sitangsu Ghosh, Mr. Pradip Khatua, Dr. D. Roy & Mr. Biswajit Ojha

A three-day training programme was held to make the farmers aware on adoption of BMPs in shrimp culture and species diversification in aquaculture at the meeting hall, Safiabad, Purba Medinipur from September 18 to 20, in which 20 farmers attended.

The programme discussed subjects like present status and future prospects of shrimp farming in Purba Medinipur, CAA registration of shrimp farms, farm enrollment of MPEDA, biological aspects of shrimp, pond preparation, seed selection, stocking etc, water and soil quality management, nutrition and feed management, BMPs and health management, abuse of antibiotics in aquaculture, NRCP monitoring/ Sample collection, bio-security in shrimp culture, role of MPEDA/Schemes of MPEDA, price issues in shrimp farming, about Seafood Import Monitoring Programme and diversification into crab culture, Seabass culture, all male Tilapia culture as well as formation of aqua societies.

Dr. D. Roy, Junior Technical Officer, MPEDA Sub Regional Division, Contai, welcomed the participants and explained the purpose of conducting the training programme. Mr. Pradip Khatua, a lead farmer and a feed dealer from Safiabad, Purba Medinipur, advised the trainees to make use of this opportunity to acquire latest information on culture practices for sustainable shrimp culture. He appreciated MPEDA for conducting training programme at Safiabad. Mr. Biswajit Ojha, Field Manager, NaCSA, Purba Medinipur, suggested that trainees should adopt cluster-based shrimp culture and formation of aqua societies for better management and successful crop.

Mr. Sitangsu Ghosh, a lead farmer, also talked about the utility of this training programme in making farmers aware about the recent scientific approaches in shrimp farming.

Dr. Roy, in his lectures, covered subjects like status of shrimp culture in Purba Medinipur district, role and schemes of MPEDA, CAA registration and farm enrolment of MPEDA, biological aspects of shrimp,

A view of participants

pond preparation, seed selection and stocking, nutrition and feed management, BMP and heath management, Disease management in shrimp culture, abuse of antibiotics in aquaculture, bio-security measures in shrimp culture, the importance of effluent treatment system and reservoir for sustenance of shrimp culture, NRCP monitoring and sample collection and also presented technical topics on species diversification in aquaculture.

Mr. Biswajit Ojha, Field Manager, NaCSA talked on aqua society formation, benefits of cluster based shrimp farming and BMPs in shrimp culture.

While talking about the issues of shrimp prices and the Seafood Import Monitoring Programme, he explained about the farmers being quality consciousness about overseas consumers and the EU directives and screening of farmed samples for antibiotic residues.

He requested the farmers to adopt BMPs for production of disease free shrimps, thereby reducing the use antibiotics and chemicals.

Valedictory session was attended by Ms. Debasree Sahoo, Pradhan, Panchayat Samiti, Dhobabaria Anchal; Mr. Pradip Khatua, lead farmer and feed dealer; Dr. Roy and Mr. Biswajit Ojha. Dr. Roy proposed the vote of thanks too. Certificates of participation and stipend were distributed to all the twenty participants.

Training Programme on BMPs for Sustainable Aquaculture

The Sub Regional Division of MPEDA at Bhimavaram has organised a three-day training programme on Better Management Practices (BMPs) for Sustainable Aquaculture Gundipudi village of East Godavari district from September 25 to 27.

Mr. K. Sadguru Murthy, Lead Farmer, Gundipudi inaugurated the programme, which was attended by 25 trainees. Mr. K. Ramanjaneyulu, Junior Technical Officer, MPEDA, delivered the lecture on BMPs, schemes and services of MPEDA, antibiotic issues in shrimp culture, farm enrolment and fish exchange portal.

Mr. Laxmi Narayana, Field Manager, NaCSA, took class on formation of aqua society and its benefits.

On the final day, Mr. Ananda Rao, Assistant Director of Fisheries, Amalapuram, talked about farm enrolment and explained about schemes of the Department of Fisheries and also distributed the certificates, farm enrolment card and stipend to the trainees.

A group discussion of participants with MPEDA officials marked the conclusion of the training programme.

The Largest 'Ship' in the World

The aquaculture vessel being built in China will be the largest 'ship' in the World, when completed in 2020. This ship-shaped vessel is designed as a salmon farm that can be moored in offshore waters thus creating a major expansion of fish farming operations. Called

Havfarm this vessel has been designed by NSK Ship Design in conjunction with the owners Nordlaks and the concept is claimed to herald the beginning of a sustainable revolution in the fish farming industry.

The Havfarm will be 431 metres in length and will have a beam of 54 metres and it will be anchored in waters off the coast of Norway with a turret mooring system similar to those used in the offshore oil industry. Norway is a world leader in this field, and the designers are comfortable creating solutions that can withstand very tough conditions at sea.

One *Havfarm* will be able to contain 10,000 tons of salmon, which is over 2 million fish. The facilities will be able to withstand a significant wave height of ten metres, and the ship can be raised by four metres during inclement weather. The ocean farm itself will extend ten metres below sea level and will be constructed as a steel frame for six "cages" measuring 50 by 50 metres on the surface, with aquaculture nets going to a depth of 60 metres.

The *Havfarm* will be manned by a crew of 7 and food silos will have a capacity of 1000 tons with power supplied by generators in the stern housing.

- www.maritimejournal.com

Pragmatization of SOP's of INFAAR project

Participants and faculty of the programme

Hands-on Training for Young Professionals on "Pragmatization of SOP's of INFAAR project" under the Network Project on "Assessment of Antimicrobial Resistance in Microorganisms Associated with Fisheries and aquaculture in India" was organized at Microbiology, Fermentation and Biotechnology Division of ICAR-Central Institute of Fisheries Technology, Kochi from October 22 to 31. The training programme was inaugurated by Dr. C. N. Ravishankar, Director, ICAR-CIFT Kochi. In his inaugural speech, Dr. Ravishankar

underscored the need and importance of the appraisal of AMR in microorganisms in perspective of aquaculture development. He stressed on the non-availability of comprehensive database on AMR–microorganisms in fisheries sector and was hopeful of generating reliable database on this count. The welcome address was delivered by Dr. M. M. Prasad, Course Director and PI of INFAAR Project. Dr. G. K. Sivaraman, Principal Scientist proposed vote of thanks. Dr. V. Murugadas, Co-PI of the project coordinated practical/demonstration of the training programme.

The participants included nine Young Professionals from ICAR-CIFA, CIFE, CMFRI, DCFR and CIFT and one Scientist and Co-PI from ICAR-CIFA. During the programme, lectures were delivered and a field visit was also made to Thrissur to get the trainees acquainted with sampling procedures for uniformity. The isolation, characterization, phenotypic and molecular identification of the target organisms of the project E. coli, Vibrio parahaemolyticus and Staphylococcus aureus were dealt in detail. This was followed by ABST of each organism and genotypic confirmation of antibiotic sensitivity of the same. In the programme, emphasis was on hands-on-experience and the feedback in the form tests, indices related to outcome and from participants in revealed that the efforts reached right into targets. In the valedictory function on October 31, C. N. Ravishankar, Director extoled the participants for their keen interest in learning new aspects and said the whole INFAAR implementation mainly rest in the follow-up of new technical knowledge acquired by them and applying the same to field and laboratory.

Earlier Dr. M. M. Prasad, Course Director, gave important aspects of the outcome of the training and pragmatization for the national network project. Dr. Ravishankar awarded the participants with certificates and the programme came to an end with vote of thanks by Dr. Sivaraman.

- CIFT

ICAR-CIBA Signs MoU with Ministry of Earth Sciences (ESSO)-NIOT at Chennai

ICAR-CIBA entered into the MOU with ESSO-NIOT for technical collaboration in the promotion of aquaculture systems in the country. The MoU was signed on September 25 by Dr. K. K. Vijayan, the Director CIBA and Dr. M. A. Atmanand, the Director of NIOT, in the presence of Dr. Madhavan Rajeevan, Secretary, Ministry of Earth Sciences (MoES); Chairman, Earth System Science Organization and Dr. Vipin Chandra Joint Secretary, MoES, at NIOT campus, Chennai.

The MOU will help to contribute towards the roadmap conceived by the MoES 'Farming the Oceans for the Future' to promote India's blue economy. Partnership of NIOT with its blend of engineering expertise in finfish cages and CIBA with its proven technologies in hatchery, farming and feed biotechnology for candidate finfish species such as Seabass, would help in expanding the finfish cage culture operation, in the depths from 5 m to 100m. This has the potential for the production of 5 MMT of marine fish, by utilizing just 1% of the Indian EEZ, once the procedure for leasing and site specific cage culture systems are in place, with institutional and private sector participation.

The initiative will facilitate increased fish production, generation of employment income, along the costal belt of India.

- ICAR - CIBA

Successful Demonstration of Milkfish Farming in Brackish Water

Milk Fish Harvest

ICAR-CIBA has successfully demonstrated an innovative two-tier milkfish farming, nursery rearing of fingerlings and grow-out in an open water pen erected in the brackish water body, as a livelihood initiative for the benefit of tribal families, supported by CIBA under Tribal Sub Plan. Both nursery and grow out culture have given economically impressive results, where in 0.5g milkfish fry stocked in the nursery pond @ 2nos/m2 attained an average body weight of 12 g with a survival rate of 70% in 43 days. Subsequently, these 12g size milkfish fingerlings were transferred to a pen culture enclosure erected in pulicat lake area, and stocked @ 2.5 nos/m2 in a 400 m2 pen system. Feeding was done with slow sinking formulated feed, 'CIBApolyplus', with a cost of Rs. 30/kg developed by CIBA @ 2-3% body weight on daily basis. After 55 days of grow out culture, the fish attained an average body weight of 125g - 180g with a survival rate of 70%.

A production of 60 kg milkfish was harvested. The cost of production was worked out to be Rs.80/kg. The fishes were sold @ Rs.120/kg with the net return of Rs.40 and Benefit Cost Ratio is 1.25. The present demonstration showed that milkfish farming in open water systems is technically feasible and economically viable, environmentally friendly and sustainable in providing livelihood to the tribal families, other communities with access to water bodies.

A Harvest function was conducted on October 23 at the demonstration site Kanavanthurai village in Tiruvallur district, Tamil Nadu. Around 100 participants including village panchayat president, progressive fish and shrimp farmers, tribal families, officials from Chennai Petro Chemicals Ltd., who are partnering with CIBA in supporting the coastal families for their economic improvement elsewhere under corporate social responsibility (CSR) scheme, officials from Bank of India (BOI), attended the function. Scientists from CIBA involved in the livelihood support programme, Dr. C. P. Balasubramanian, Dr. B. Shanthi, Dr. M. Kailasam, Dr. P Mahalakshmi, Dr. C. V. Sairam, Technical officers and staff from CIBA, school teachers and children, tribal beneficiaries were also present.

The Irular tribal beneficiaries thanked CIBA for the support towards providing an alternative livelihood opportunity. Dr. B. Shanthi, Principal Scientist team leader of the demonstration coordinated the event, along with other scientist team from CIBA.

- ICAR - CIBA

Successful Commissioning of Solar Hybrid Dryer by an Entrepreneur

ICAR-CIFT has developed different models and capacities of solar dryers for hygienic drying of fish. CIFT-Hybrid model solar dryers are having LPG, biomass or electricity as alternate back up heating source for continuous hygienic drying of fish even under unfavourable weather conditions.

The capacity of these hybrid solar dryers varies from 6 to 110 m2 of tray spreading area for drying of various quantities of fish varying from 10 kg to 500 kg. CIFT developed eco-friendly and energy efficient solar hybrid dryers are gaining momentum among fishermen community and dry fish business start-ups.

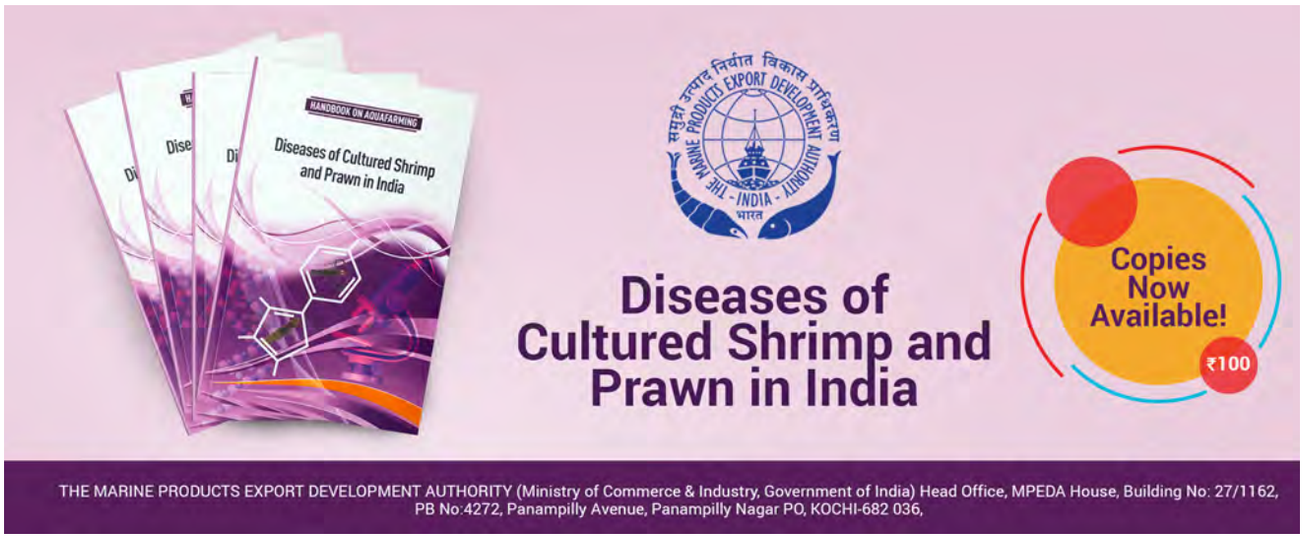
Mr. Martin, of Kumbalangi in Ernakulam district, was one of the trainee who attended the two-day training programme on pre-processing and drying of fish conducted from October 24 to 25. In light of the knowledge about the energy and cost efficient solar drying technology ICAR-CIFT perceived during the training period, he approached the Institute with a determined plan to start a venture in hygienic dry fish business.

Initially, he registered with the Agri-business incubation unit of the Institute and started drying fish in CIFT solar dryers, for which an operating cost was incurred from him. Shrimp, mackerel, lizard fish, silver croaker, sole fish, glassy perchlet, anchovy etc. were commonly dried. He did test marketing of the solar dried fish with ICAR-CIFT logo under the brand name "EMMA Dry Fish Products" in the local markets and nearby super markets. The demands for the hygienic and solar dried fish products made him realize the potential of dry fish business.

Since, ICAR-CIFT has around 10-15 incubatees who adopted the solar drying technology, the availability of each incubatee to use the dryer was less. Hence, Mr. Martin approached ICAR-CIFT with an intention to purchase one unit of solar-electrical dryer of 20 kg capacity under the technical support of ICAR-CIFT.

The request was accepted and fabrication of the dryer was executed through ICAR-CIFT empanelled agency. On 13th November 2017, the dryer was commissioned at the residence of Mr. Martin at Kumbalanghi. ICAR-CIFT officials visited the site and evaluated the performance of the dryer. Currently Mr. Martin is supplying hygienic solar dried fish products under the brand name of "EMMA Solar Dried Fish Food-Premium Quality" in 31 supermarkets of Ernakulam district.

- CIFT



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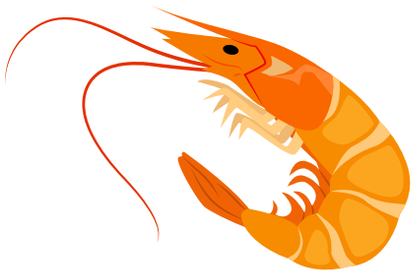

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Reef cod, Tilapia and other fish

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Vannamei shrimp, Black tiger, Tilapia clean finless tail on

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Web: www.pijikay.com
All kinds of seafood

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Fish, Shrimp

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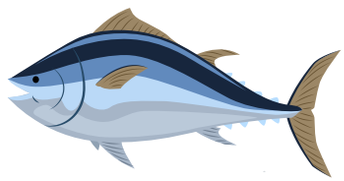
Fish, Shrimp



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