



MPEDA

Newsletter

VOL. IX NO. 2 MAY 2021

**Live and Chilled Fish
Exports: Challenges
& Prospects**

COVER STORY
**Square Mesh Cod-ends:
A Harnai Success Story**

**e-SANTA: Connecting
Farmers & Buyers**

**Export Performance
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On the Platter

K. S. Srinivas IAS
Chairman

Friends,

May 2021 had brought out a series of achievements for MPEDA. The most important one is that the Rajiv Gandhi Centre for Aquaculture (RGCA), which is the R & D wing of MPEDA engaged in commercial aquaculture techniques, has received a patent for Mub crab (*Scylla serrata*) hatchery technology from the India Patent Office up to October 2031. RGCA has established the first Mud crab hatchery in India in 2004 at Thoduvai, Tamil Nadu with an initial capacity of 1 Million per annum and has been supplying crab instars to the farmers since then. The production capacity was increased to 1.4 Million per annum last year.

The National Centre for Sustainable Aquaculture (NaCSA) has opened 5 more Aqua One Centres (AOC) in Andhra Pradesh during the month, which is aimed to assist the farmers in continuous pond monitoring programme. As of now, 19 AOCs have become operational under NaCSA in Andhra Pradesh, West Bengal, Odisha and Karnataka. Two more hatcheries, M/s. BMR marine Products Pvt. Ltd. and M/s. Srinidhi Biotechnologies, both located in Visakhapatnam were certified under MPEDA's SHAPHARI scheme for the production of antibiotic residue free seeds. Altogether 3 hatcheries are now certified under the scheme.

On the quality front, MPEDA Quality Control Labs at Porbandar and Bhubaneswar have attained NABL accreditation as per ISO 17025:2017 besides Export Inspection Council of India (EIC) approval. QC Lab Kochi has got its NABL accreditation and EIC approval scope expanded to microbiological parameters and antibiotic testing by ELISA method. Now, all the QC Labs of MPEDA are NABL accredited and approved by EIC, and are permitted for Pre Export Testing of fish and fishery products for markets other than EU, China and Japan. I would request all the exporters to utilize the services of MPEDA QC labs.

MPEDA has participated in Virtual Business Conference on "Marine Fisheries and Aquaculture" organized by Embassy of India in Philippines and Philippines Chamber of Agriculture & Food Inc. The conference had a participation of more than 200 prominent business players from both the countries. A Secondary Buyer Seller Meet was also organized by MPEDA with a Japanese buyer who trades squid rings for US market.

Though the month has seen an intense impact of second wave of Covid-19 virus, MPEDA has ensured that its services are extended without interruption with the farmers and exporters. This was largely due to the dedicated workforce of MPEDA and adoption of digitization in its services. MPEDA too has lost a few personnel to the microbe. Despite, the MPEDA team remains available for extending its services to the sector braving the adverse situations.

Thank you.

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The World Trade Organization & Global Trade Agreements



The WTO

The World Trade Organization (WTO) is the only global international organization dealing with the rules of trade between nations. At its heart are the WTO agreements, negotiated and signed by the bulk of the world's trading nations and ratified in their parliaments. The goal is to ensure that trade flows as smoothly, predictably and freely as possible. In brief, the World Trade Organization (WTO) is the only international organization dealing with the global rules of trade.

Global trade rules

Global rules of trade provide assurance and stability. Consumers and producers know they can enjoy secure supplies and greater choice of the finished products, components, raw materials and services they use. Producers and exporters know foreign markets will remain open to them. This leads to a more prosperous, peaceful and accountable economic world. Decisions in the WTO are typically taken by consensus among all members and they are ratified by member's parliaments.

Trade frictions are channelled into the WTO's dispute settlement process, where the focus is on interpreting

agreements and commitments and to ensure that member's trade policies conform to them. That way, the risk of disputes spilling over into political or military conflict is reduced. By lowering trade barriers through negotiations among member governments, the WTO's system also breaks down other barriers between peoples and trading economies.

At the heart of the system – known as the multilateral trading system – are the WTO's agreements, negotiated and signed by a large majority of the world's trading economies' and ratified in their parliaments. These agreements are the legal foundations for global trade. Essentially, they are contracts, guaranteeing WTO members important trade rights.

They also bind governments to keep their trade policies transparent and predictable which is to everybody's benefit. The agreements provide a stable and transparent framework to help producers of goods and services, exporters and importers conduct their business. The goal is to improve the welfare of the peoples of the WTO's members.

"The past 70 years have seen an exceptional growth in world trade. Merchandise exports have grown on average by 6% annually."

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Trade negotiations

The World Trade Organization came into being in 1995. One of the youngest of the international organizations, the WTO is the successor to the General Agreement on Tariffs and Trade (GATT) established in the wake of the Second World War.

So while the WTO is relatively young, the multilateral trading system that was originally set up under the GATT is over 70 years old. The past 70 years have seen an exceptional growth in world trade. Merchandise exports have grown on average by 6% annually. This growth in trade has been a powerful engine for overall economic expansion and on average trade has grown by 1.5 times more than the global economy each year. Total exports in 2016 were 250 times the level of 1948. The GATT and the WTO have helped to create a strong and prosperous trading system contributing to unprecedented growth.

The system was developed through a series of trade negotiations, or rounds, held under the GATT. The first rounds dealt mainly with tariff reductions but later negotiations included other areas such as anti-dumping and non-tariff measures. The 1986-94 round – the Uruguay Round – led to the WTO's creation. The negotiations did not end there. In 1997, an agreement was reached on telecommunications services, with 69 governments agreeing to wide-ranging liberalization measures that went beyond those agreed in the Uruguay Round.

In the same year, 40 governments successfully concluded negotiations for tariff-free trade in information technology products, and 70 members concluded a financial services deal covering more than 95% of trade in banking, insurance, securities and financial information. In 2000, new talks started on agriculture and services. These were incorporated into a broader work programme, the Doha Development Agenda, launched at the fourth WTO Ministerial Conference in Doha, Qatar, in November 2001.

The new work programme included negotiations and other work on non- agricultural tariffs, trade and the environment, WTO rules on anti-dumping and subsidies, trade facilitation, transparency in government procurement, intellectual property and a range of issues raised by developing economies as difficulties they face in implementing WTO agreements. Negotiations on these and other topics have resulted in major updates to the WTO rulebook in recent years. A revised Government Procurement Agreement – adopted at the WTO's 8th Ministerial Conference in 2011 – expanded

the coverage of the original agreement by an estimated US\$ 100 billion a year.

At the 9th Ministerial Conference in Bali in 2013, WTO members struck the Agreement on Trade Facilitation, which aims to reduce border delays by slashing red tape. When fully implemented, this Agreement – the first multilateral accord reached at the WTO – will cut trade costs by more than 14% and will lift global exports by as much as US\$ 1 trillion per year.

The expansion of the Information Technology Agreement – concluded at the 10th Ministerial Conference in Nairobi in 2015 – eliminated tariffs on an additional 200 IT products valued at over US\$ 1.3 trillion per year. Another outcome of the Conference was a decision to abolish agricultural export subsidies, fulfilling one of the key targets of the UN Sustainable Development Goal on “Zero hunger”. Most recently, an amendment to the WTO's Intellectual Property Agreement entered into force in 2017, easing poor economies' access to affordable medicines. The same year saw the Trade Facilitation Agreement enter into force.

“Each member receives guarantees that its exports will be treated fairly and consistently in other member's markets.”

WTO agreements

WTO tries to ensure that trade happens and grows as fair as possible among the countries, and as open as is practical. This is done to a maximum possible level by negotiating rules and abiding by them.

The WTO's rules – the agreements – are the result of negotiations between the members. The current set is largely the outcome of the 1986- 94 Uruguay Round negotiations, which included a major revision of the original General Agreement on Tariffs and Trade (GATT). The Uruguay Round created new rules for dealing with trade in services and intellectual property and new procedures for dispute settlement. The complete set runs to some 30,000 pages consisting of about 30 agreements and separate commitments (called schedules) made by individual members in specific areas, such as lower tariffs and services market-opening.

Through these agreements, WTO members operate a non- discriminatory trading system that spells out their rights and their obligations. Each member receives guarantees that its exports will be treated fairly and consistently in other member's markets.

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Each promises to do the same for imports into its own market. The system also gives developing economies some flexibility in implementing their commitments.

Goods

It all began with trade in goods. From 1947 to 1994, the GATT was the forum for negotiating lower tariffs and other trade barriers; the text of the GATT spelt out important rules, particularly non-discrimination. Since 1995, the Marrakesh Agreement Establishing the WTO and its annexes (including the updated GATT) has become the WTO's umbrella agreement.

It has annexes dealing with specific sectors relating to goods, such as agriculture, and with specific issues such as product standards, subsidies and actions taken against dumping. A recent significant addition was the Trade Facilitation Agreement, which entered into force in 2017.

Services

Banks, insurance firms, telecommunications companies, tour operators, hotel chains and transport companies looking to do business abroad enjoy the same principles of more open trade that originally only applied to trade in goods. These principles appear in the General Agreement on Trade in Services (GATS). WTO members have also made individual commitments under the GATS stating which of their service sectors they are willing to open to foreign competition, and how open those markets are.

Intellectual property

The WTO's Intellectual Property Agreement contains rules for trade in ideas and creativity. The rules state how copyrights, patents, trademarks, geographical names used to identify products, industrial designs and undisclosed information such as trade secrets – "intellectual property" – should be protected when trade is involved.

Dispute settlement

The WTO's procedure for resolving trade conflicts under the Dispute Settlement Understanding is vital for enforcing the rules and therefore for ensuring that trade flows smoothly. Governments bring disputes to the WTO if they think their rights under the WTO agreements are being infringed. Judgements by specially appointed independent experts are based on interpretations of the agreements and individual members' commitments.

The system encourages members to settle their differences through consultation with each other. If this proves to be unsuccessful, they can follow a stage-by-stage procedure that includes the possibility of a ruling by a panel of experts and the chance to appeal the ruling on legal grounds. Confidence in the system is borne out by the number of cases brought to the WTO – more than 500 cases since the WTO was established compared with the 300 disputes dealt with during the entire life of the GATT (1947-94).

Trade monitoring

The WTO's Trade Policy Review Mechanism is designed to improve transparency, to create a greater understanding of the trade policies adopted by WTO members and to assess their impact. Many members see the reviews as constructive feedback on their policies. All WTO members must undergo periodic scrutiny, each review containing reports by the member concerned and the WTO Secretariat.

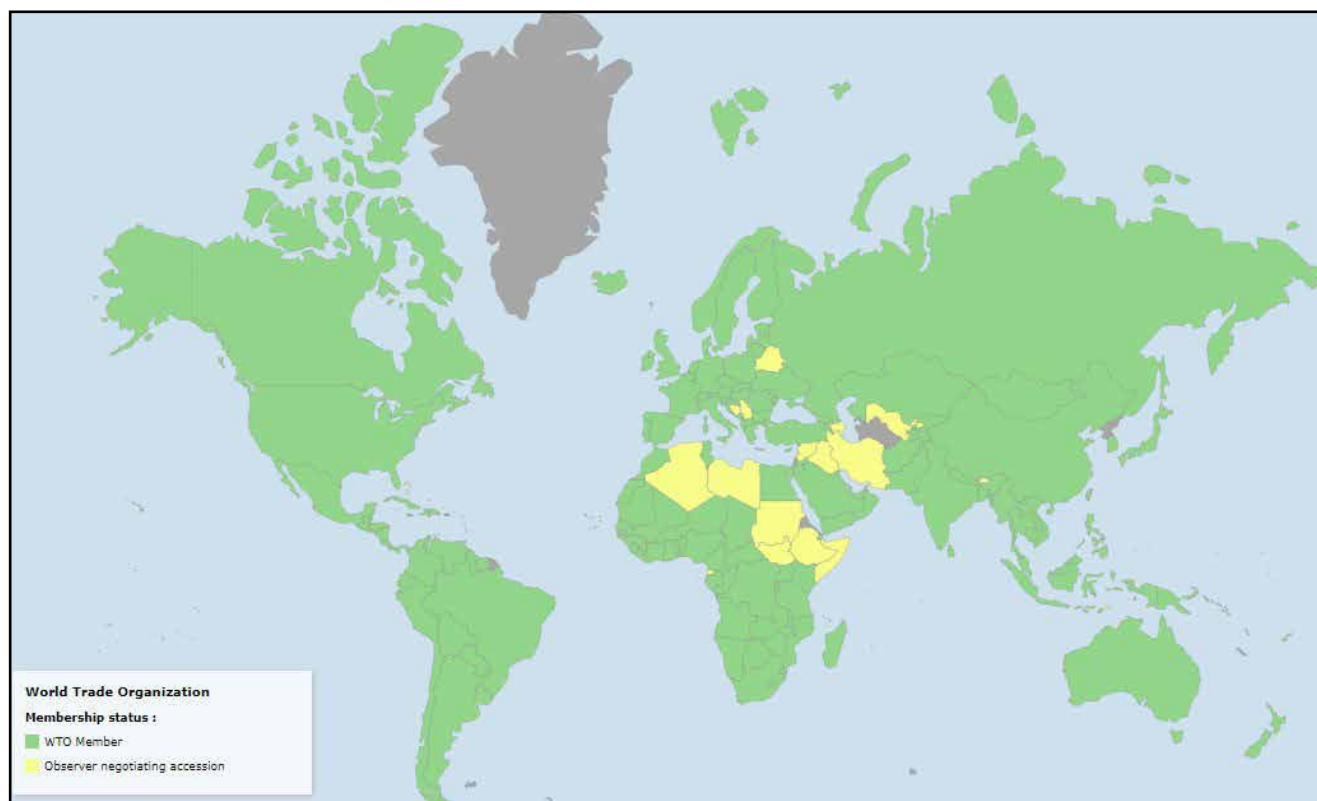
In addition, the WTO undertakes regular monitoring of global trade measures. Initially launched in the wake of the financial crisis of 2008, this global trade monitoring exercise has become a regular function of the WTO, with the aim of highlighting WTO member's implementation of both trade-facilitating and trade-restricting measures.

"A WTO Committee on Trade and Development looks at developing economies' special needs."

Building trade capacity in developing economies

Over three-quarters of WTO members are developing or least-developed economies. All WTO agreements contain special provisions for them, including longer time periods to implement commitments, measures to increase their trading opportunities and support to help them build the infrastructure needed to participate in world trade.

A WTO Committee on Trade and Development looks at developing economies' special needs. Its responsibility includes implementation of the WTO agreements, technical cooperation and the increased participation of developing economies in the global trading system. The Aid for Trade initiative, launched by WTO members in 2005, is designed to help developing economies build trade capacity, enhance their infrastructure and improve their ability to benefit from trade-opening opportunities. So far, over US\$ 340 billion has been



disbursed to support Aid for Trade projects. A Global Review of the initiative is held every two years at the WTO's headquarters. The Enhanced Integrated Framework (EIF) is the only multilateral partnership dedicated exclusively to assisting least developed countries (LDCs) in their use of trade as an engine for growth, sustainable development and poverty reduction. The EIF partnership of 51 countries, 24 donors and eight partner agencies, including the WTO, works closely with governments, development organizations, civil society and academia. The EIF has invested in over 170 projects, with US\$ 220 million committed to supporting the poorest countries in the world.

Another partnership supported by the WTO is the Standards and Trade Development Facility (STDF), set up to help developing economies meet international standards for food safety, plant and animal health and access global markets. The WTO houses the Secretariat and manages the STDF trust fund, which has provided financing of over US\$ 40 million to support projects in low-income economies.

Technical assistance and training

The WTO organizes hundreds of technical cooperation missions to developing economies annually. It also

holds many trade policy courses each year in Geneva for government officials. Regional seminars are held regularly in all regions of the world, with a special emphasis on African countries.

E-learning courses are also available. In 2017, some 18,500 participants benefited from WTO training aimed at improving understanding of WTO agreements and global trade rules.

"The WTO has 164 members, accounting for 98% of world trade. A total of 22 countries are negotiating membership."

How the WTO is organized

Functions

The WTO's overriding objective is to help trade flow smoothly, freely and predictably. It does this by:

- administering trade agreements
- acting as a forum for trade negotiations
- settling trade disputes
- reviewing national trade policies
- building the trade capacity of developing economies
- cooperating with other international organizations

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Structure

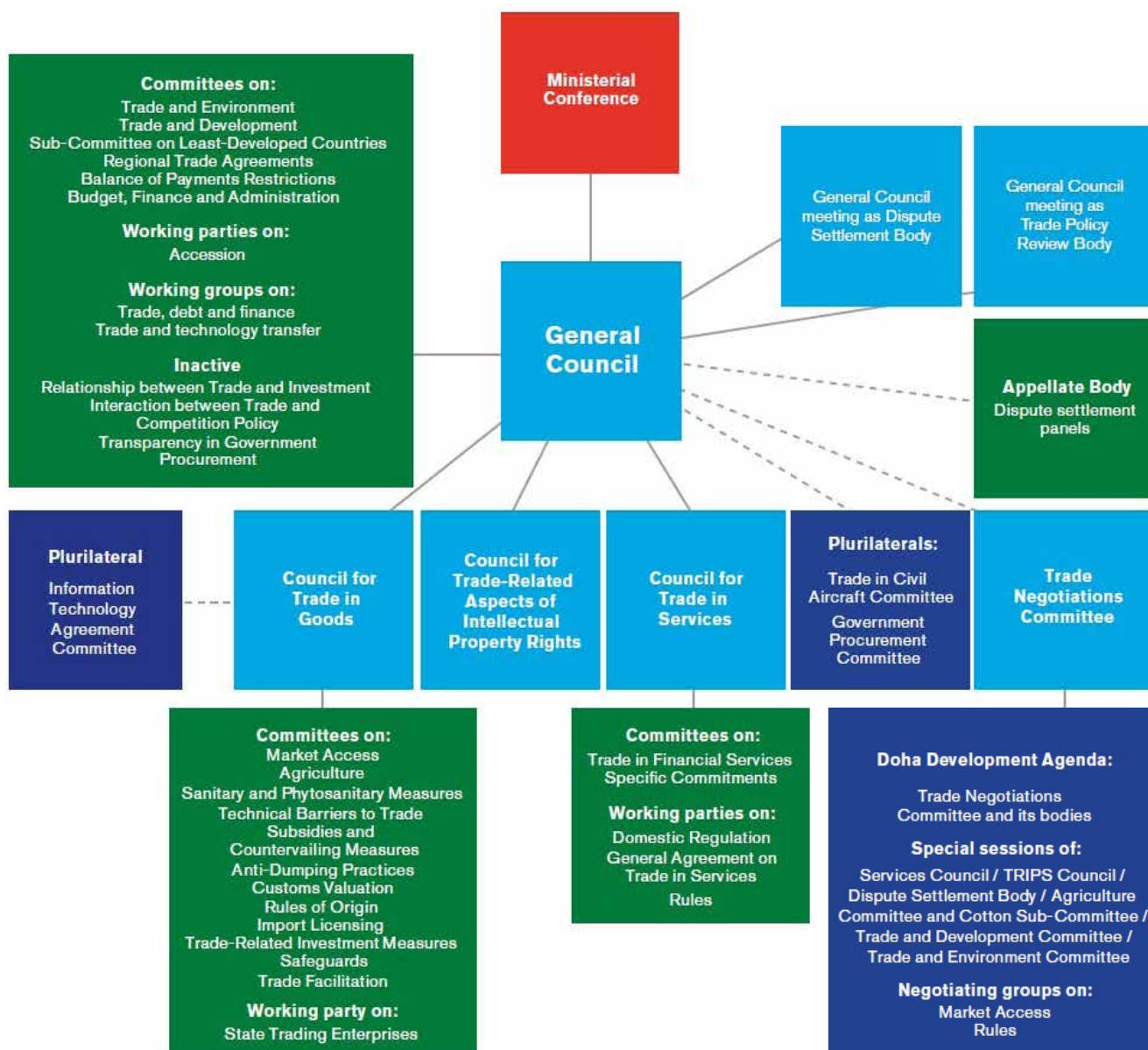
The WTO has 164 members, accounting for 98% of world trade. A total of 22 countries are negotiating membership. Decisions are made by the entire membership. This is typically by consensus. A majority vote is also possible but it has never been used in the WTO, and was extremely rare under the WTO's predecessor, the GATT. The WTO's agreements have been ratified in all members' parliaments. The WTO's top level decision-making body is the Ministerial Conference, which meets usually every two years. Below this is the General Council (normally ambassadors and heads of delegation based in Geneva but sometimes officials sent from members capitals) which meets several times a year in the Geneva headquarters.

The General Council also meets as the Trade Policy Review Body and the Dispute Settlement Body.

At the next level, the Goods Council, Services Council and Intellectual Property (TRIPS) Council report to the General Council. Numerous specialized committees, working groups and working parties deal with the individual agreements and other areas, such as the environment, development, membership applications and regional trade agreements.

WTO Secretariat

The WTO Secretariat, based in Geneva, has around 630 staff and is headed by a Director-General. It does not have branch offices outside Geneva. Since



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decisions are taken by the WTO's members, the Secretariat does not itself have a decision-making role.

The Secretariat's main duties are to supply technical support for the various councils/ committees and the ministerial conferences, to provide technical assistance for developing economies, to analyse world trade and to explain WTO activities to the public and media.

The Secretariat also provides some forms of legal assistance in the dispute settlement process and advises governments wishing to become members of the WTO. The annual budget contributed by members is roughly 197 million Swiss francs.

The WTO

LOCATION: Geneva, Switzerland

ESTABLISHED: 1 January 1995

CREATED BY: Uruguay Round negotiations (1986-94)

MEMBERSHIP: 164 members representing 98% of world trade (as of 30 Sept 2018)

BUDGET: 197 million Swiss francs for 2018

SECRETARIAT STAFF: 630

The General Council agreed by consensus on 15 February 2021 to select Dr. Ngozi Okonjo-Iweala of Nigeria as the organization's seventh Director-General. When she takes office on 1 March, Dr Okonjo-Iweala will become the first woman and the first African to be chosen as Director-General. Her term, renewable, will expire on 31 August 2025.



Dr Ngozi Okonjo-Iweala is a global finance expert, an economist and international development professional with over 30 years of experience working in Asia, Africa, Europe, Latin America and North America. Currently, Dr Okonjo-Iweala is Chair of the Board of Gavi, the Vaccine Alliance.

Reference: www.wto.org





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Live & chilled fish exports: Current status and prospects

Jeyabal A, Joint Director, MPEDA and Biju V N, Assistant Director, MPEDA

Export of live and chilled fish is one of the significant foreign exchange earning seafood export avenues for India. The country has exported 7287 MT of live fish worth Rs.324.26 crore and 21202 MT of chilled fish worth Rs. 631.84 crore during 2019-20. Live fish and chilled fish export has good scope for further development. Tamil Nadu is one of the leading exporters of live and chilled fish from the country and Chennai is a major hub of the export activity.

The following Live items are exported from Tamil Nadu: Mud crab, Blood clam (*Anadara granosa*), Whelk (*Baigai*), Horn Shell (*Cerithidea obtusa*), Murex, Lobster, Eel, etc. Tamil Nadu exported 2450 MT live fish worth Rs.146.85 crore in 2019-20. The major export market for live fish are South East Asian countries.



Fig. 1. Live Mud crab packed for export



Fig. 2. Live Lobster



Fig.3. Live Baigai

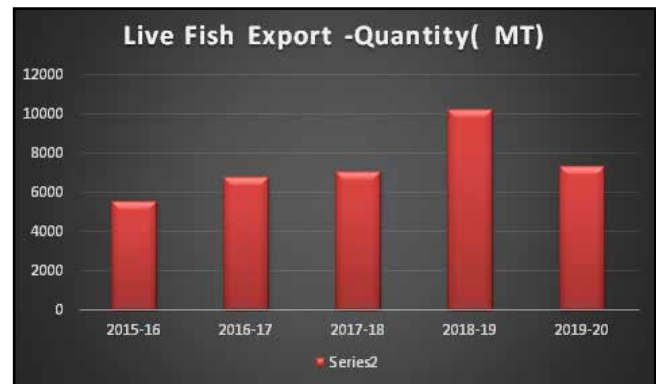


Fig. 4. Live fish exports from India in quantity (MT)

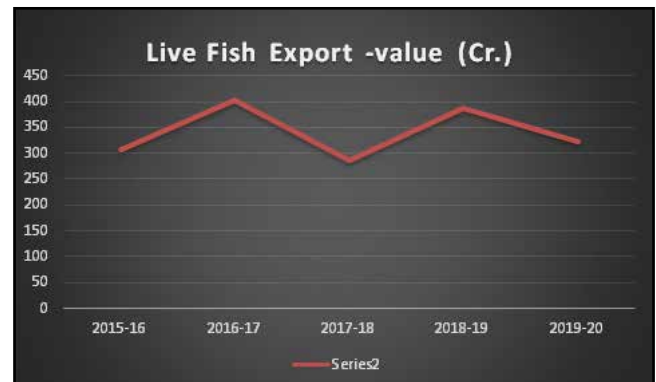


Fig.5. Live fish exports from India in value (Rs. Cr.)

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Fig.6. Live Blood clam



Fig. 7. Live Sea snail

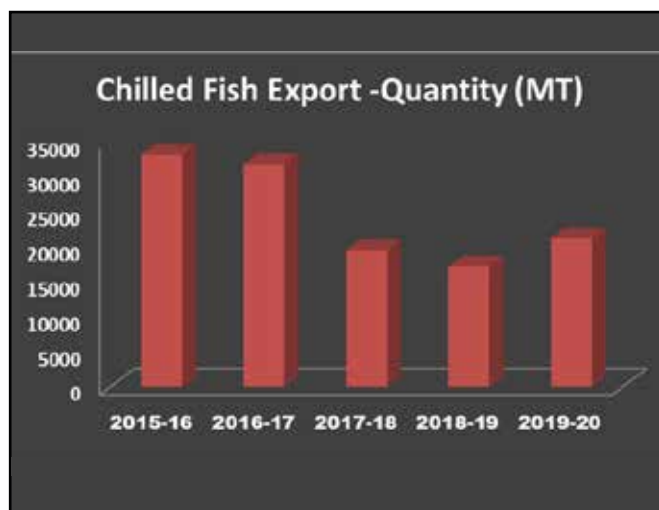


Fig.8. Chilled fish exports from India in quantity (MT)

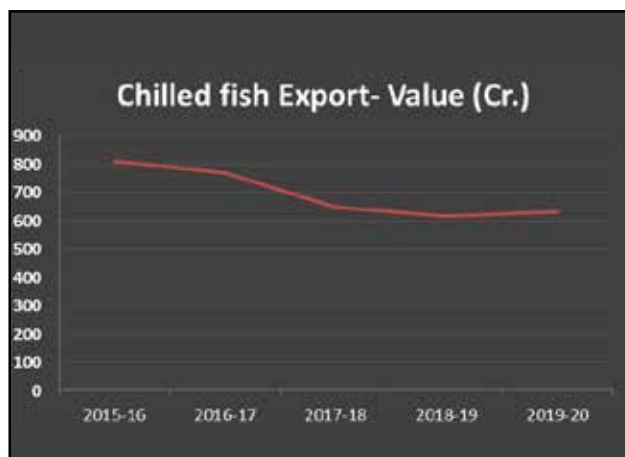


Fig. 9. Chilled fish exports from India in value (Rs.Cr.)



Fig. 10. Packing of chilled fish

The major chilled fish varieties exported are Shrimp, Grouper, Snapper, Pomfret, Reef cod, Red Sea Bream, Coral Trout, Mackerel, Shrimp, Tuna, King fish, Mullet, Seer fish, Parrot fish, Emperor fish, Rohu, Catla, Pearl spot, Sardine, Swordfish, Sailfish, Goatfish, Crab, Lobster, Clam meat, Elephant mulli meat, Cuttlefish, Squid etc.

Tamil Nadu exporters are focusing on value added chilled fish items such as fish fillet, besides gilled and gutted whole fish which fetches better price in niche markets. Sashimi-grade tuna fillet fetches around US\$12 in the EU market. The state exported 6508 MT chilled fish worth Rs. 281.12 crore during 2019-20. The major markets for chilled fish are the Middle East, the South East Asia, China, the USA, the European Union and Japan.



Fig. 11. Sashimi Grade Tuna fillet for export



Fig. 12. Chilled shrimp packed for export

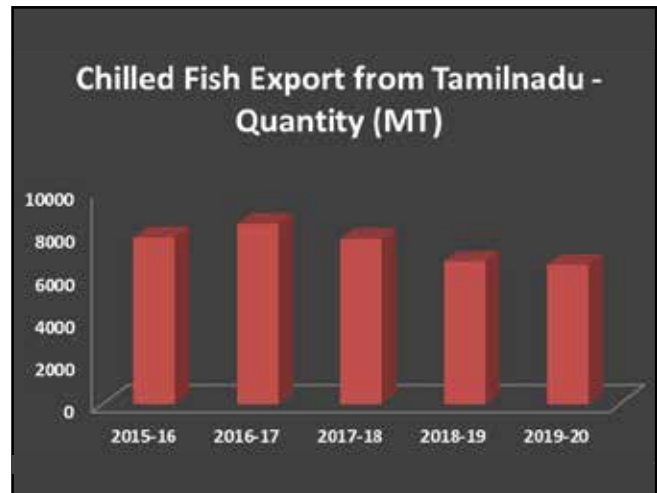


Fig. 15. Chilled Fish exports from Tamil Nadu in quantity (MT)

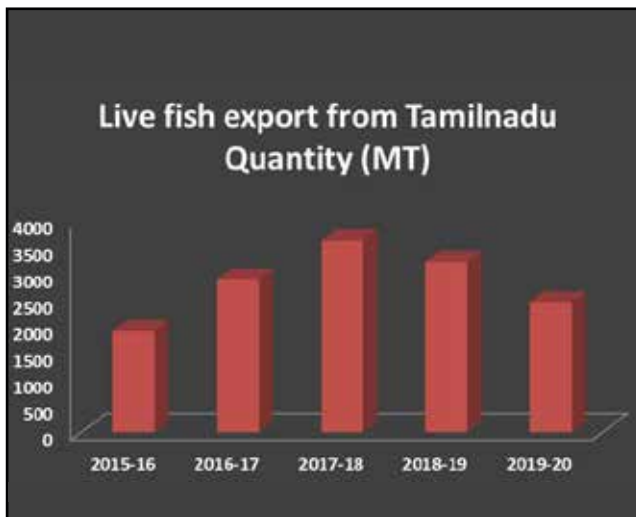


Fig. 13. Live fish export from Tamil Nadu in quantity (MT)

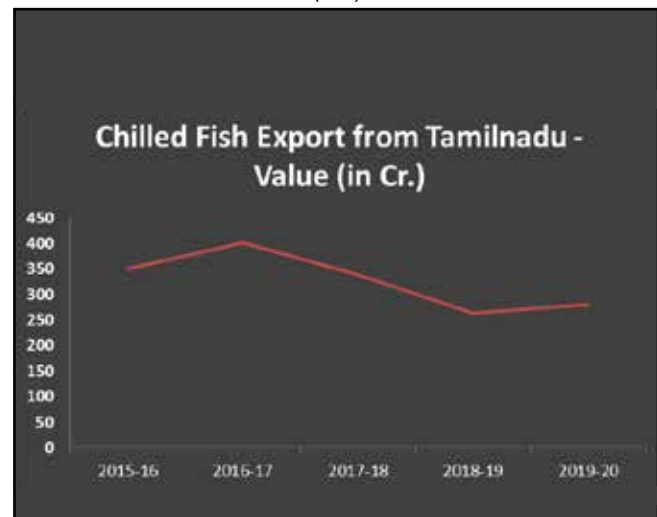


Fig. 16. Chilled fish export from Tamil Nadu in value (Rs. Cr.)

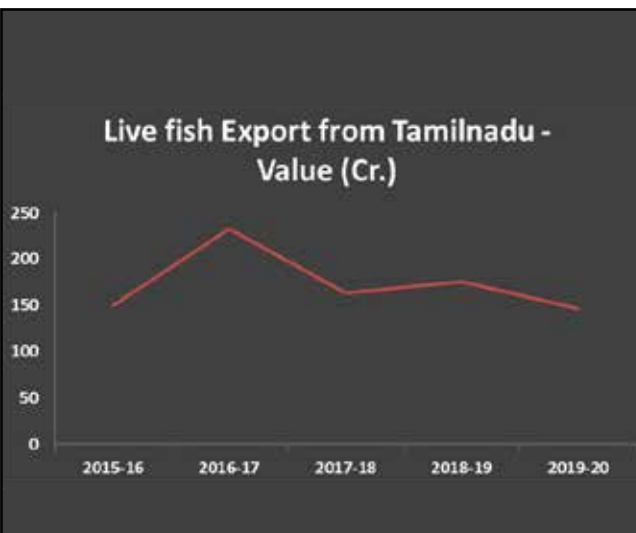


Fig. 14. Live fish export from Tamil Nadu in value (Rs. Cr.)

Challenges faced by the live/chilled fish export sector

Some of the challenges faced by the sector are highly competitive international market, higher air freight charge, shortage of cargo space for perishable products, low frequency of flights to export markets, delay caused by various reasons, logistics interruptions, and financial loss to the exporter resulting from regulatory and logistics issues.

Live Crab exports

Live crab is one of the lucrative seafood export items from Tamil Nadu. *Scylla serrata*, commonly known as the Mud crab, Green crab or Mangrove Crab, is an economically important species of crab found in the estuaries and mangroves of India.

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The major markets for live crab are Southeast Asian countries. Mud crab fetches SGD 10 – 36 per kg in the international market based on grade and quality.

Table 1. Export price of live Green crab

Grade	Export Price (SGD)
350g up	20
500 g up	26
750 g up	32
1000g up	36

Table 2. Export price of live Red crab

Grade	Export Price (SGD)
200g up	10
300 g up	12
400 g up	15
500g up	18

Mud crabs for export are either sourced from the wild or aquaculture farms. Aquaculture of mud crab has gained momentum in the recent days. Andhra Pradesh is the leading mud crab farming state followed by Kerala, Tamil Nadu and West Bengal. MPEDA-RGCA mud crab hatchery located at Sirkali, Tamil Nadu is the major mud crab seed supplier for aquaculture. CIBA-ICAR, Muttukadu, Chennai is another source of mud crab seed. MPEDA-RGCA also provides training to farmers on mud crab farming.

Conclusion

The Live and chilled fish export sector needs attention and nurturing for further development. MPEDA has taken steps to resolve issues faced by the sector based on the inputs from the exporters such as:

- 1) Proposal for repacking unit near airports
- 2) Cold storage facility at airports
- 3) Separate cargo handling and ventilated space at airports
- 4) Intervention with customs/ air cargo handlers/air lines to reduce cargo handover time from present 7 hrs to 3hrs before departure of flight

Contact details of RGCA Mud crab hatchery:

RGCA Mud Crab Hatchery, Thoduvai, Sirkali, Tamil Nadu. Contact number for Seed booking - 7598842296.
www.rgca.org.in



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Marine fish landings decline in April amid fishing ban

Dr. Afsal V.V. & Dr. Joice V. Thomas
NETFISH-MPEDA

Boat arrivals and marine fish landings at selected major harbour/landing centres across nine coastal states of India are being recorded by NETFISH to facilitate the Catch Certification System of MPEDA. The number of boat arrivals and the quantity of various fishery items landed at these harbours are collected on a regular basis. This report presents the species-wise, harbour-wise and state-wise trend of marine landings during April 2021, with reference to the data obtained from 93 major harbours.

I. ESTIMATION OF FISH LANDINGS

Marine catch landings reported from the 93 selected harbours during the month of April 2021 totalled 39242.44 tonnes. The Pelagic finfish resources contributed the most to the total catch with a share of 41% (16218.28 tonnes). It was followed by the Demersal finfishes with 33% share (12918.82 tonnes), Crustaceans with 13% share (5112.48 tonnes) and Molluscs with 13% share (4992.86 tonnes) (Fig.1).

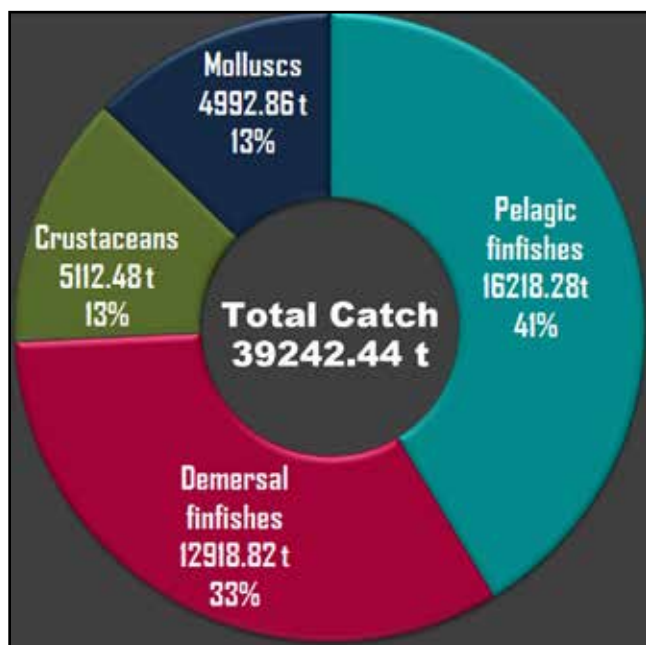


Fig.1. Catch composition of marine landings recorded in April 2021

The total catch comprised of about 247 species of marine fishery items, of which the highest five contributors were *Rastrelliger kanagurta* (Indian mackerel), *Nemipterus japonicus* (Japanese threadfin bream), *Lepturacanthus savala* (Ribbon fish), *Loligo duvauceli* (Squid) and *Harpadon nehereus* (Bombay duck) (Table 1).

Table 1. Major fish species landed during April 2021

Sl. No:	Common name	Scientific name	Qty. in tonnes
1	Indian mackerel	<i>Rastrelliger kanagurta</i>	2816.90
2	Japanese threadfin bream	<i>Nemipterus japonicus</i>	2559.44
3	Ribbon fish	<i>Lepturacanthus savala</i>	2517.80
4	Squid	<i>Loligo duvauceli</i>	2352.16
5	Bombay duck	<i>Harpadon nehereus</i>	1596.37

Considering various groups of fishery items landed, the top five contributors were Ribbon fishes, Croakers, Squids, Coastal shrimps and Indian Mackerel, which together formed 39 % of the total catch (Fig 2).

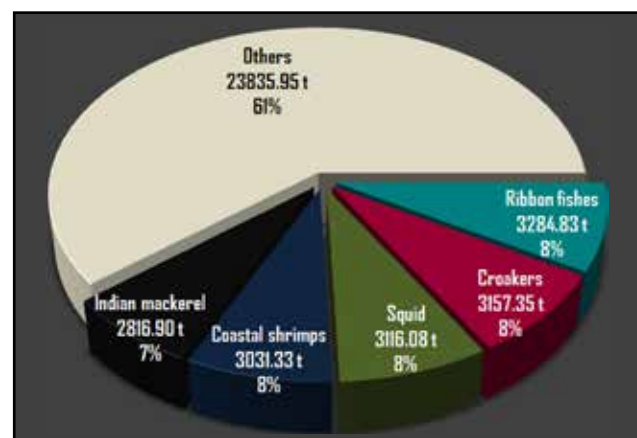


Fig. 2. Major fishery items landed during April 2021

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Table 2 presents the total catch quantity of various categories of fishery items recorded during April 2021. Among the Pelagic finfish resources, Ribbon fishes, Indian mackerel & Tunas were the major contributors with a landing of more than 2000 tonnes. Croakers & Japanese Threadfin breams were the most landed items among the Demersal finfishes, each contributing more than 2500 tonnes. About 59% of the Crustacean catch comprised different species of Coastal shrimps whereas, among the Molluscs, Squids and Cuttlefishes were the major items landed.

Table 2. Category- wise landing of various fishery items during April 2021

FISHERY ITEM	QUANTITY LANDED (TONNES)	% OF TOTAL CATCH
Pelagic Finfishes		
Ribbon fishes	3284.83	8.37
Indian mackerel	2816.90	7.18
Tunas	2119.81	5.40
Anchovies	1815.76	4.63
Scads	1793.40	4.57
Bombay duck	1596.37	4.07
Indian oil sardine	629.87	1.61
Lesser sardines	419.33	1.07
Seer fishes	392.48	1.00
Shads	232.25	0.59
Barracudas	189.14	0.48
Trevallies	142.55	0.36
Mahi mahi	127.88	0.33
Sailfish	113.07	0.29

Flying fish	102.48	0.26
Swordfish	94.13	0.24
Needlefish	70.61	0.18
Herrings	68.67	0.17
Marlins	55.74	0.14
Mullets	44.56	0.11
Queen fish	39.34	0.10
Cobia	26.02	0.07
Indian Salmon	25.57	0.07
Milk fish	7.93	0.02
Halfbeaks	7.69	0.02
Sea bass	1.25	0.00
Pompano	0.66	0.00
Total Pelagic	16218.28	41.33
Demersal finfishes		
Croakers	3157.35	8.05
Japanese threadfin bream	2559.44	6.52
Lizard fishes	1786.57	4.55
Sea catfishes	1124.55	2.87
Reef cods	584.51	1.49
Bulls eyes	518.64	1.32
Sole fish	514.61	1.31

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Sea breams	492.95	1.26
Pomfrets	394.51	1.01
Moon fish	371.95	0.95
Trigger fishes	259.74	0.66
Flat heads	182.53	0.47
Goat fishes	166.84	0.43
Sharks	153.81	0.39
Leatherjacket	128.08	0.33
Eels	108.57	0.28
Pony fishes	87.26	0.22
Snappers	75.93	0.19
Rays	70.36	0.18
White fish	70.34	0.18
Emperor breams	30.03	0.08
Rabbit fishes	19.05	0.05
Threadfin	13.27	0.03
Silver biddy	11.37	0.03
Perches	10.39	0.03
Halibut	7.71	0.02
Groupers	4.03	0.01
Indian threadfish	3.49	0.01
Whiting	3.34	0.01
Sweet lips	2.33	0.01

Threadfin breams	2.08	0.01
Spade Fish	1.49	0.00
Grunts	0.55	0.00
Parrot fish	0.44	0.00
Sickle fish	0.39	0.00
Surgeonfish	0.21	0.00
Pony fishes	0.12	0.00
Total Demersal	12918.82	32.92
Crustaceans		
Coastal shrimps	3031.33	7.72
Deep sea shrimps	1480.56	3.77
Crabs	573.41	1.46
Lobsters	27.18	0.07
Total Crustaceans	5112.48	13.03
Molluscs		
Squid	3116.08	7.94
Cuttlefish	1575.75	4.02
Octopus	255.06	0.65
Whelk	45.97	0.12
Total Molluscs	4992.86	12.72
TOTAL CATCH	39242.44	100.00

State-wise landings: Of the 9 coastal states, Gujarat reported the highest marine catch landings during April 2021, with a quantity of 14217.71 tonnes (36%) (Fig.3). Maharashtra, in the second position, contributed 7034.57 tonnes (18%) to the total catch. Karnataka

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held the third position with a total landing of 4900.75 tonnes (12%). The least marine landing during the month was reported in West Bengal, with a meagre quantity of 932.99 tonnes (2%) of catch.

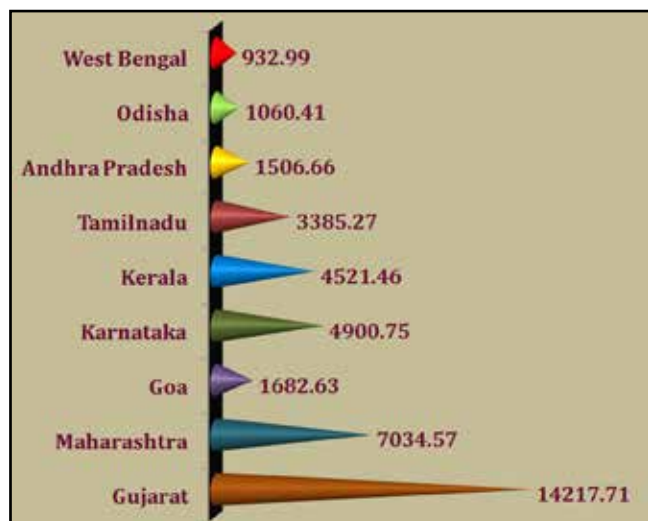


Fig.3 State-wise fish landings (in tonnes) during April 2021

Harbour-wise landings: The total marine landing reported from each harbour is given in Table 3. Among the 93 harbours, Porbandar harbour in Gujarat recorded the maximum fish landing, which was to the tune of 4077.43 tonnes (10%) and it was followed by New Ferry Wharf and Veraval harbours with 3560.69 tonnes (9%) and 3069.26 tonnes (8%) respectively. The least landing was reported from Jagathapatinam harbour in Tamil Nadu (1.12 tonnes).

Table 3. Harbour-wise catch quantity & boat arrivals during April 2021

State	Harbour	Catch Quantity (tonnes)	Boat arrivals (nos.)
West Bengal	Namkhana	546.25	179
	Raidighi	194.05	72
	Petuaghat Deshpran	93.32	23
	Fraser Ganj	47.87	48
	Digha Sankarpur	36.12	18
	Kakdwip	12.04	19
	Soula	3.34	15

Odisha	Paradeep	459.23	105
	Balramgadi	271.88	158
	Balugaon	136.50	478
	Bahabalpur	114.56	53
	Dhamara	78.25	30
Andhra Pradesh	Visakhapatnam	1042.73	248
	Yanam	122.96	82
	Vodarevu	92.72	152
	Nizampatnam	91.92	26
	Kakinada	74.57	43
	Machilipatnam	56.68	38
	Pudimadaka	25.09	103
Tamil Nadu & Pondicherry	Chennai	707.05	404
	Colachel	539.76	261
	Tharuvaikulam	509.26	171
	Thengaipattinam	479.22	468
	Karaikal	393.48	204
	Pazhayar	230.80	470
	Nagapattinam	212.97	387
	Poompuhar	92.41	495
	Pondicherry	51.27	54
	Pulicat	31.29	432

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	Mudasalodi	28.38	185		Thottappally	55.48	204
	Kodiyakarai	24.32	442		Munakkadavu	52.59	244
	Cuddalore	22.84	253		Vizhinjam	52.19	451
	Rameswaram	19.61	55		Mopla Bay	32.52	251
	Chinnamuttom	18.63	428		Koyilandi	32.28	199
	Mallipatnam	15.06	127		Chettuva	10.07	82
	Kottaipatnam	5.37	55	Karna- taka	Malpe	2133.93	872
	Mandapam	2.44	19		Mangalore	1887.73	688
	Jagathapathi- nam	1.12	12		Honnavar	466.31	203
Kerala	Sakthikulangara	1094.73	730		Gangolli	143.08	435
	Munambam	734.76	550		Bhatkal	93.12	384
	Thoppumpady Cochin	656.25	286		Amdalli	62.90	139
	Neendakara	521.71	581		Karwar	43.57	82
	Kayamkulam	321.62	229		Tadri	43.28	129
	Bey pore	272.66	277		Belekeri	26.83	71
	Vypin	129.36	100	Goa	Malim	1052.18	371
	Azheekkal	102.95	219		Cutbona	359.69	157
	Thangassery	100.25	217		Vasco	236.84	171
	Chellanam	80.69	326		Chapora	33.92	259
	Cheruvathur	76.61	143	Maha- rashtra	New Ferry Wharf	3560.69	657
	Puthiyappa	65.89	89		Ratnagiri	1126.74	302
	Ponnani	64.52	210		Sasoon Dock	897.36	324
	Vaadi	64.36	240		Sakharinate	281.27	184

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	Harne	272.66	603
	Arnala	213.12	91
	Alibagh Koliwada	156.60	378
	Versova	125.95	113
	Malvan	116.71	370
	Satpati	93.98	118
	Taramumbari Devgad	65.47	411
	Dahanu	59.82	250
	Onni Bhatti Dabhol	44.65	166
	Uttan	19.54	13
Gujarat	Porbandar	4077.43	1366
	Veraval	3069.26	1887
	Mangrol	2084.99	1487
	Okha	2044.55	859
	Jafrabad	1450.00	435
	Vanakbara	1116.21	638
	Kotada	200.24	60
	Chorwad	175.03	634

II. ESTIMATION OF BOAT ARRIVALS

A total of 27747 boat arrivals were recorded from the 93 harbours during April 2021. State-wise figures

(fig. 4) show that the highest number of boat arrivals had occurred in Gujarat (27%) and then in Kerala (20%) and Tamil Nadu (18%). The harbour-wise details of boat arrivals are given in table 3. The highest recording was from Veraval (1887 nos.), Mangrol (1487 nos.) and Porbandar (1366 nos.) harbours in Gujarat. The Jagathapatinam harbour in Tamil Nadu had the least number of boat arrivals.

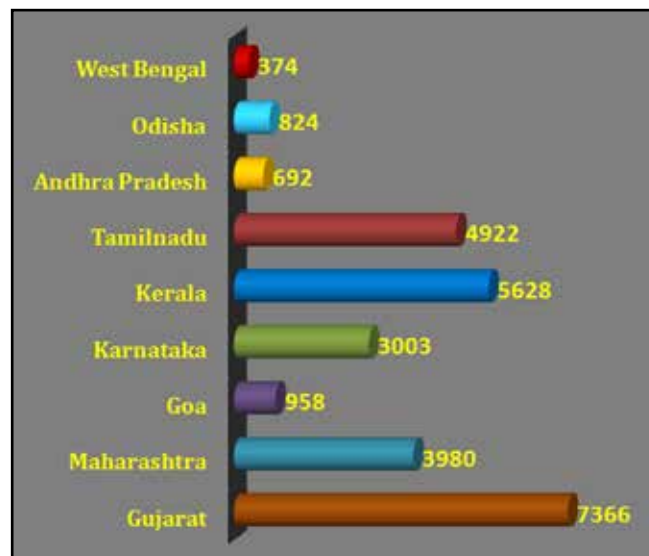


Fig.4 State-wise boat arrivals (nos.) during April 2021

Summary: In April 2021, a total of 39242.44 tonnes of marine catch landings and 27747 nos. of boat arrivals were reported from the 93 major fish landing sites of India. The total catch has shown a decrease by around 21582 tonnes, when compared to that of March 2021 and the number of boat arrivals decreased by around 6442 numbers. The reduction in catch and boat arrivals during the period can be attributed to the monsoon fishing ban implemented in the East Coast from the mid of April 2021.

Pelagic finfish continued to be the major contributor to the total landings and the Indian mackerel maintained its top position among the most landed fish species for the month. However, among the various groups of fishery items Ribbon fish recorded the highest landings during the period.

As in previous months, Gujarat continued in the first position among the states in terms of total catch landed whereas the Porbandar harbour has taken over the prime position among the harbours. In terms of boat arrivals, Gujarat state and Veraval harbour in the state maintained its first position.



e-SANTA: A platform linking primary producers with processors

In India shrimp farming started in a traditional way with its native species of shrimps like *P. Monodon*, popularly known as black tiger and *P. indicus* (white shrimp). Scientific shrimp farming took roots in the country during the late 80s. Introduction of *L. vannamei*, the exotic species from pacific region to India on a commercial basis in 2008-09 has increased the shrimp production in the country and its contribution to shrimp production has increased from a meagre 2% in 2009-10 to more than 90% during 2019-20.

In India shrimp aquaculture is concentrated in nine coastal states viz., West Bengal, Odisha, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Goa, Maharashtra and Gujarat. Andhra Pradesh is the major state accounting for more than 70% of the production. Two major shrimp species farmed in the country are *L. Vannamei* and *P.monodon*.

The area utilized in the country for shrimp farming is 1.58 lakh ha and there is further potential to develop one lakh more ha during the next five years. The average infrastructure and operational cost for shrimp farming is one Rs.12 lakh/ha. The average production/ha is around 5 tons /ha. The price realised by the farmer per Kg is Rs.300- Rs 450 depending upon the size of the shrimp.

Marine Product Exports:

During the year 2019-20 India exported 12,89,651 MT worth seafood and the value realized is Rs.46,663 Crore. The contribution of cultured shrimp to exports is 5,64,321 MT by quantity and Rs.29,622 crore by value. More than 63% of the seafood export value is contributed by cultured shrimp.

About NaCSA

National Centre for Sustainable Aquaculture (NaCSA) is an extension arm of the Marine Products Export Development Authority (MPEDA), Govt. of India, Ministry of Commerce & Industry.

The objectives of NaCSA is to encourage and uplift the small and marginal farmers through organization of clusters and maintaining Best Management Practices in shrimp culture.

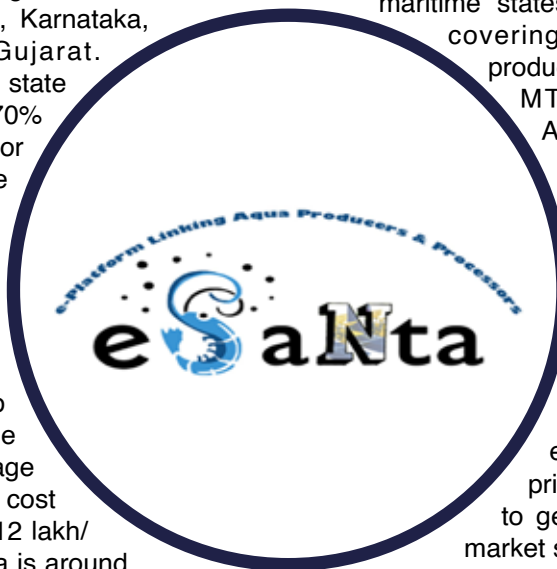
NaCSA has so far registered 752 societies in eight maritime states with a farmer base of 18211 covering 12607ha of farm water area producing on an average 40000-50000 MT of *L. vannamei* shrimp/year. Andhra pradesh being the hub of aquaculture in India, most of the aqua societies of NaCSA are located in that state.

Challenges faced by aqua farmers:

The farmers face several challenges in shrimp culture, especially to obtain a remunerative price for their produce. Farmers fail to get a fair deal due to the existing market structure with middlemen between them and the buyers. The exporters also face numerous challenges such as consistency in the product purchased and quality related issues.

Need for e-SANTA

Present marketing practices involve middlemen who take away a good portion of the profit leading to exploitation of the small and marginal farmers. Since the middlemen combine the material procured from various farms, it would be difficult to ensure traceability, which is essential for international trade. A direct selling mechanism between farmers and processors/exporters



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can help in ensuring fair prices for farmers and also ensures traceability.

NaCSA has taken the initiative to build a digital bridge between the Aqua farmers and processors so that the processors can directly approach the farmers and procure the material eliminating the middlemen in the process.

Each step in the e-SANTA process is captured electronically avoiding paperwork completely. The platform is initially designed for registered society farmers of NaCSA and the registered exporters of MPEDA only and can be extended to all aqua farmers in near future.

About e-SANTA

e-SANTA is an electronic marketplace providing a platform bridging aqua farmers and the buyers. It enables the farmers to get a better price and the exporters to directly purchase quality products from the farmers enhancing traceability, a key factor in international trade. "SANTA" is a popular term used all over South India, for weekly markets and for congregation of people for sale/purchase of their produce and is equivalent to "Mandi" in North India. Keeping in mind the popularity of the word SANTA, the term e-SANTA was coined for the web portal, meaning Electronic Solution for Augmenting NaCSA farmers' Trade in Aquaculture.

e-SANTA is a completely paperless and an end-to-end electronic trade platform between Farmers and exporters. The farmers have the freedom to list their produce and quote their price while the exporters have the freedom to list their requirements and also to choose the products based on their requirements such as desired size, location, harvest dates etc.

This enables the farmers and buyers to have greater control over the trade and enables them to make informed decisions. e-SANTA is an initiative powered by National Center for Sustainable Aquaculture (NaCSA), and is supported by the Marine Products Export Development Authority functioning under the Department of Commerce and MPEDA.

Stakeholders involved:

1. Aqua Farmer: Primary Producer of the crops
2. NaCSA : Facilitates the transactions and Administers the Portal
3. Processors/Exporter: Who purchases the produced crops

How it works

1. Registration:

Both farmers and buyers have to register with their existing MPEDA ID and the system will fetch the relevant details of both buyer and seller from the existing MPEDA databases, making the registration process simple and authentic.

2. Steps to sell and buy online:

1. Each crop will be listed by the farmer in the platform with detailed information like species, size (count), quantity available, seed used, feed used, photographs of the pond & produce, quality certifications from designated laboratories etc.
2. Buyers can list their requirements and also search crops based on preferred location, preferred size (count), and preferred price etc.
3. Based on the negotiation for the price, seller and buyer make agreement for sale
4. End to end electronic payments: All the payment modes of UPI, Debit, Credit, Net banking are available on the platform.

What makes e-SANTA an ideal destination for farmers and exporters:

- The platform provides detailed specification of each product listing and it is backed by an end to end electronic payment system with NaCSA as an Escrow agent.
- After crop listing and online negotiation, a deal is struck, advance payment is made and an estimated invoice is generated.
- Once the harvest date is fixed, the buyer goes to the farm gate and the produce is harvested in his presence.
- Once the harvest is completed, the final count, quantity of materials verified, the final amount is decided and delivery challan is issued.
- Once the material reaches the processing plant, the final invoice is generated and the exporter makes the balance payment.
- This payment is reflected in the escrow account. NaCSA verifies it and accordingly releases the payment to farmers.

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Highlights:

- Platform is available in multiple languages viz., Hindi, English, Telugu, Tamil, Bengali and Odiya.
- Easy registration of farmers and buyers by fetching and validating details using MPEDA APIs.
- Visibility to buyers about upcoming harvests across PAN India.
- Visibility to Farmers about buyers purchase preferences.
- Advanced search options to buyers to explore the crop.
- Notice board view of exporter demand listing to farmers.
- Negotiation between farmer & buyer takes place electronically by SMS, email, etc.
- NACSA acts as the facilitator for the entire transaction/ Sale.
- Complete end to end paperless system.
- 360-degree view of the crop including its grading, certifications, lab reports.
- Flexible algorithm driven platform to manage and adjust.
- Electronic payments with the help of Razor Pay.
- All the payments are Escrow protected and will be released to farmers based on the check systems.

Traditional Practice Vs e-SANTA:

In Traditional practice, harvest is lifted by middlemen. Middlemen are therefore deciding the price, business happens on a trust basis and there is heavy chances of dispute and market is limited and monopolized. In e-SANTA, there is direct trade between farmers and exporters. Farmers have the freedom to quote the price, business happens with legal bindings and there is less chances of dispute and it also widens the market with PAN India buyers.

Users of e-SANTA.

- No of NaCSA registered societies- 752.
- No of farmers in the registered societies- More than 18000.

- No of registered exporters- 1455.
- Contribution to marine exports- Approximately contribute US \$ 20 million with 40,000 Tons of traceable, antibiotic free, high quality raw material for export processing.
- Potential to bring nearly 2 lakh shrimp farmers over the next few years with a production of nearly 7 lakh tones of shrimp.

PMU of e-SANTA: The Project Management Unit (PMU) of e-SANTA consists of a three member team and will carry out the following functions.

Sl.No	Designation	Experience
1	Project Manager	7+ years
2	PHP Developer	5 + years
3	Operations Analyst	2+ years

- Periodic maintenance of site.
- Understanding and analyzing the data.
- Organizing and motivating the project managing team.
- Ensuring customer-client satisfaction.
- Managing reports and necessary documentation.
- Conducting analysis of website and application requirements.
- To address Troubleshooting application and code issues.
- Integrating data storage solutions.
- Updating and altering application features to enhance performance.
- To handle user manual of the platform.
- Handling continuous demonstration and online seminar with respect to the platform.
- Manage all technical; related support calls.
- Find ways to increase quality of customer service.

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Launch of e-SANTA portal for direct sale of aquafarm products to exporters

The Marine Products Export Development Authority (MPEDA) on 13th April 2021 launched e-SANTA portal that enables direct selling between the country's aqua farmers and seafood processors/exporters, addressing a major concern on fair prices and boosting shrimp exports amid precise traceability.

Hon'ble Union Minister for Commerce and Industry Mr. Piyush Goyal inaugurated e-SANTA, which facilitates easy registration of farmers and buyers by fetching and validating details using MPEDA's application programme interfaces.

The launch was done through a video conference, which was attended by Union Minister of State for Commerce and Industry Mr. Som Parkash, Commerce Secretary Mr. Anup Wadhawan, Joint Secretary Mr. Diwakar Nath Misra and Director Mr. L Steephen. MPEDA Chairman Mr. K. S. Srinivas welcomed the dignitaries and NaCSA CEO Mr. K. S. Rao proposed the Vote of thanks.

Mr. Goyal, after the inaugural sale of farmed shrimp on e-SANTA, said the platform is initially designed for NaCSA-registered farmers and MPEDA-registered exporters. It will be extended to all aqua farmers in the near future, he added, recommending the addition of more Indian languages.

"By stopping the present marketing practice that involves middlemen who take away a good portion of the profit, e-SANTA will put an end to the exploitation of small and marginal farmers," he noted. "The portal permits the processors to directly approach the aqua farmers and procure the material. It will revolutionize aqua farming in the country and function as a one-stop solution for the domestic markets and exporters."

The stakeholders using e-SANTA are the aqua farmers who produce the crops and the seafood processors/exporters who purchase the crop. The other stakeholder is NaCSA, which facilitates and administers the portal. Mr. Srinivas noted that the portal would help check the age-old exploitation of aquafarmers, and take their business to a new level in tune with changing times.

The benefits include providing a pan-India visibility to buyers about upcoming harvests and to farmers about the purchase preferences of the buyers. "It also gives advanced search options to buyers to explore the crop



The poster is for the inauguration of the eSaNta portal. At the top, it features the logos of MPEDA, eSaNta, and NaCSA. The main title reads "Inauguration of eSaNta Electronic Solution for Augmenting NaCSA Farmers Trade in Aquaculture". Below this, the date and time are given as "13th April 2021 | 12.00 hrs". A large photo of Shri. Piyush Goyal is shown with the text "Inauguration by: Shri. Piyush Goyal (Minister of Commerce & Industry) through Video Conference". Below this, a section titled "In the presence of" features three smaller photos: Shri. Hardeep Singh Puri (Minister of State for Commerce & Industry), Shri. Som Parkash (Minister of State for Commerce & Industry), Shri. Anup Wadhawan IAS (Commerce Secretary), and Shri. K.S. Srinivas IAS (Chairman, MPEDA). A QR code is located on the right side. At the bottom, the meeting details are provided: "Meeting number 184 225 5181" and "Password 258369". The website "mpeda.gov.in" is mentioned at the bottom center. A red banner at the bottom right says "BE A PART OF THE INAUGURAL CEREMONY".

as well as a notice-board view of exporters demands listing to farmers," Mr. Srinivas said. "Further, e-SANTA facilitates electronic negotiation (by SMS and email) between farmers and buyers, even as NaCSA acts as the facilitator for the entire transaction/sale."

The platform is a complete end-to-end paperless system that gives a 360-degree view of the crop, including its grading, certifications, and lab reports. Being algorithm-driven, the platform is flexible, lending itself to adjust and manage. The payments are electronic, supported by Razor Pay. All the payments are escrow-protected and will be released to farmers based on the check systems.

Mr. Rao noted that NaCSA typically works for the uplift of the small and marginal aqua farmers through organization of clusters and maintaining best management practices in shrimp culture.



Virtual meeting with farmers and exporters on e-SANTA

In order to sensitize exporters and aqua farmers on the benefits of using the new portal 'e-SANTA', a virtual meeting was organized under the initiative of MPEDA's Regional Division of Chennai in association with NaCSA, MPEDA Sub Regional Divisions in Nagapattinam and Tuticorin.

Besides popularizing the new e-commerce portal, the meeting also intended to motivate aquaculture farmers and exporters to get themselves registered on e-SANTA. A total of 52 participants including aquaculture farmers and exporters from Tamil Nadu attended the meet.

Mr. A. Jeyabal, Joint Director, MPEDA, RD, Chennai welcomed the guests including exporters, farmers and officials of MPEDA and NaCSA. Addressing the participants, he said e-SANTA was a project envisioned by the Chairman of MPEDA for aqua farmers who have been struggling to fetch a remunerative price for their produce during the pandemic. He emphasized that farmers and exporters can utilize the platform and fill the gap on the quality of the products. Addressing the meet, Mr. C. Wilson, Deputy Director, MPEDA, Nagapattinam explained the difficulties faced by the

farmers in marketing their produce especially during the peak production season. He said e-SANTA will be a solution to this. Middlemen can be eliminated by using the platform, he added.

Mr. K. V. Viswamohanan, Vice Chairman, MPEDA & Regional President of SEAI, Tamil Nadu Region said the initiative will benefit farmer communities and enable them to get better prices. Through this platform, exporters can buy quality products and get competitive prices in the global seafood market. He urged farmers to get enrolled with MPEDA to avail benefits and ease exports to the European Union and the USA.

Mr. C. Siva, Consultant of M/s. Gangez Consultancy Service LLP, Hyderabad made a detailed presentation about e-SANTA registrations and procedures for farmers as well as exporters. The meeting was opened for discussion among farmers and exporters to clarify their doubts on e-Santa by MPEDA / NaCSA officials. Mrs. Anju, Assistant Director, MPEDA, Tuticorin proposed the Vote of thanks to mark the conclusion of the meeting.



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India's seafood export performance 2020-21

During the financial year 2020-21, India exported 11, 49,341 MT of Seafood worth US\$ 5.96 billion. USA and China are the major importers of Indian seafood. Frozen Shrimp continued to be the major export item, followed by frozen fish.

Export summary are given in the Table 1.

Table 1: Export performance during 2020-21 compared to 2019-20			
Export Details	2020-21	2019-20	Growth %
Quantity (MT)	11,49,341	12,89,651	-10.88
Value (Rs. Crore)	43,717.26	46,662.85	-6.31
Value (US\$ Million)	5,956.42	6,678.69	-10.81
Unit Value (US\$/Kg)	5.18	5.18	0.00

The Covid -19 pandemic has not spared the seafood sector as well. Though the seafood export was drastically affected during the first half of the year, the sector revived well and has shown improvement in the last quarter of the year. However, the seafood export during the year has declined by 6.31% in rupee

earnings, 10.81% in US dollar value and 10.88% in quantity. The average unit value remained almost same compared to last year.

The decadal export performance of marine products is given as Fig.1.

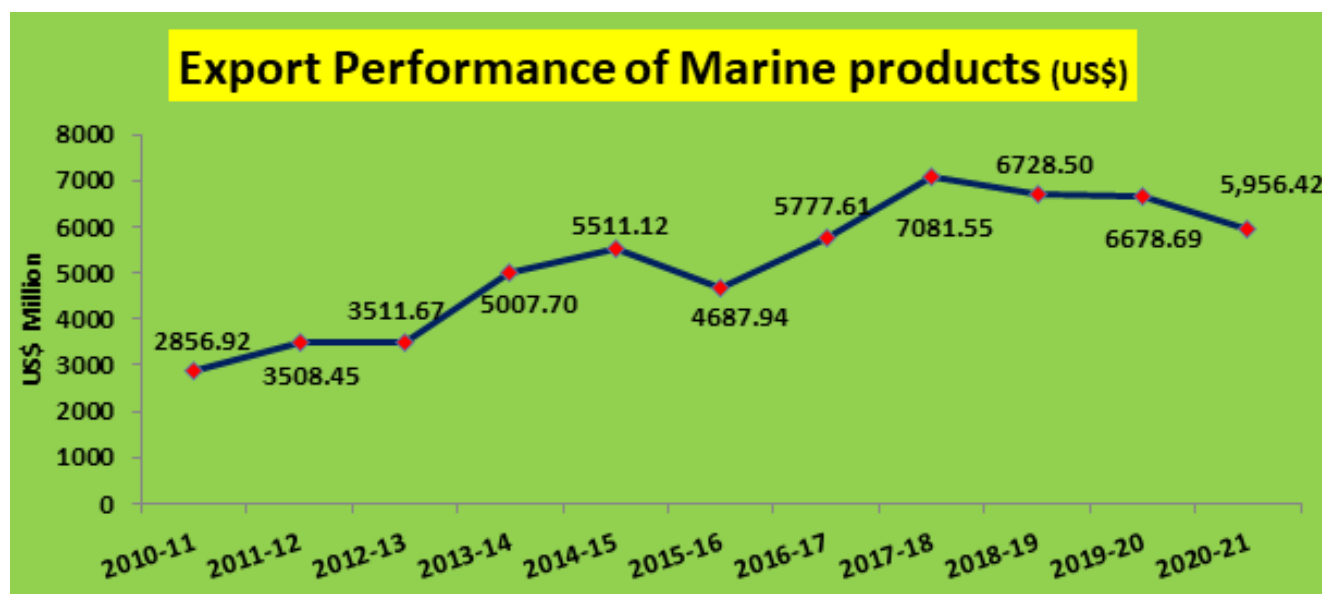


Figure.1 Decadal performance of marine product exports

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Aquaculture sector has performed better this year as evident from the figures given in Table 2. The aquaculture sector has contributed 67.99% of exported items in terms of US\$ and 46.45% in terms of quantity which is respectively 4.41% and 2.48% more compared to the figures of 2019-20. The contribution

of capture fisheries reduced from 56.03% to 53.55% in quantity and reduced from 36.42% to 32.01% in US\$ value terms. The unit value of aquaculture products increased marginally by US\$ 0.1 from 7.49 to 7.59 US\$ per Kg, but the unit value of capture fisheries items reduced slightly from 3.37 to 3.10 US\$ per Kg.

Table 2: Contribution of Aquaculture and Capture fisheries

	Aquaculture (%)		Capture Fisheries (%)	
Year	2019-20	2020-21	2019-20	2020-21
Quantity (MT)	43.97	46.45	56.03	53.55
Value (Rs. Crore)	63.57	68.07	36.43	31.93
Value (US\$ Million)	63.58	67.99	36.42	32.01
Unit Value (US\$/Kg)	7.49	7.59	3.37	3.10

It is pertinent to note that Tilapia and Ornamental fish has performed well with 55.83% and 66.55% increase respectively in quantity and 38.07% and 14.63% respectively increase in US\$ earnings. The growth performance of Tilapia will give an impetus to expand the farming of the species in the country. Tuna, though showed 14.6% increase in quantity, it showed a negative growth of 7.39% in US\$ earnings. Scampi and Crab exports reduced both in quantity and value. Please see Table 3 for details.

Table 3: Export performance of some potential species

Year		2019-20	2020-21	Growth%
Tilapia	Qty (MT)	1597	2489	55.83
	Value (Rs Cr)	13.03	18.89	45.01
	Value (US\$ Mln.)	1.87	2.59	38.07
Ornamental fish	Qty (MT)	32	54	66.55
	Value (Rs Cr)	10.84	13.08	20.59
	Value (US\$ Mln.)	1.56	1.79	14.63
Tuna	Qty (MT)	36287	41586	14.60
	Value (Rs Cr)	396.72	384.10	-3.18
	Value (US\$ Mln.)	56.58	52.40	-7.39
Scampi	Qty (MT)	1855	1334	-28.09
	Value (Rs Cr)	125.91	97.21	-22.80
	Value (US\$ Mln.)	18.08	13.23	-26.82
Crab	Qty (MT)	6733	5489	-18.48
	Value (Rs Cr)	549.07	397.81	-27.55
		78.62	54.26	-30.99

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Major Item wise exports details

Frozen shrimp continued to be the major item of export in quantity and value, accounting for a share of 51.36 % in quantity and 74.31% of the total US\$ earnings. But the unit value increase of frozen shrimp was almost inconspicuous at 0.04% from US\$ 7.496 to 7.499. Shrimp exports during the period declined by 9.47% in US\$ value and 9.50% in quantity.

The overall export of shrimp during 2020-21 was to the tune of 5,90,275 MT worth US\$ 4,426.19 Million. USA is the largest importer (2,72,041 MT) of frozen shrimp followed by China (1,01,846 MT), European Union (70,133 MT), Japan (40,502 MT), South East Asia (38,389 MT), Middle East (29,108 MT) and Other Countries (38,257 MT).

The export of *Vannamei* shrimp has decreased from 5,12,204 MT to 4,92,271 MT in 2020-21. Out of the total *Vannamei* shrimp exports, in US\$ value terms, about 56.37 % was exported to USA followed by 15.13% to China, 7.83% to European Union, 5.76 % to South East Asia, 4.96 % to Japan, 3.59 % to Middle East and 6.36% to Other Countries.

Japan emerged as the major market for Black Tiger shrimp this year with a US\$ value share of 39.68% in terms of US\$ value followed by USA (26.03%), South East Asia (9.32%), European Union (8.95%), Middle East (6.04%), China (3.76%) and Others (6.23%).

Frozen Fish retained the second position as the largest export item, accounting for a share of 16.37% in quantity and 6.75% in US\$ earnings. The export of frozen fish declined by 15.76% in quantity and 21.67% in US\$ value.

Other Items was the third largest category that shown a marginal positive growth of 0.12% and 0.26% respectively in quantity and rupee value, however declined 5.02% in US\$. This category was predominantly constituted by Surimi and Surimi analogue (imitation) products, which accounted for 76% of the exported quantity and 66.2% of the value earned.

Frozen squid exports showed a decline of 30.19%, 9%, and 13% in terms of quantity, rupee value and US\$ earnings respectively. However Unit value of realization appreciated by 24.62% from 3.59 to 4.47.

Export of Frozen Cuttlefish has showed a negative growth of 16.38 % in quantity, 19.08% in rupee value and 22.50% in USD terms

Dried items are the only category that showed an increase in all quantity, rupee value and US\$ earning terms, with a respective increase of 1.47%, 17% and 11.46% in exports. The unit value of dried items also grew by 9.84% from US\$ 1.67 to 1.83 per kg.

Export of Chilled items showed a decline of 16.89%, 24.35% and 27.90% in terms of quantity, rupee value and US\$ earnings respectively.

Live Items declined by 39.91%, 26.08% and 29.53% in terms of quantity, rupee and US\$ value respectively, though the unit value increased by 17.26% from US\$ 6.37 to 7.47 per kg during the year. Export of Chilled and live items were negatively affected mainly due to the reduced air connectivity.

The details of major items of exports are given in the Table 4.

Table.4: Item wise Export Details during April-March 2020-21

Q: Quantity in Tons, V: Value in Rs. Crores, \$: USD Million, UV\$:USD/Kg					
ITEM	Q:	51.36	590275	652253	-9.50
FROZEN SHRIMP	V:	74.39	32520.29	34152.03	-4.78
	\$:	74.31	4426.19	4889.12	-9.47
	UV:		7.50	7.50	0.04
	Q:	16.37	188130	223318	-15.76
FROZEN FISH	V:	6.73	2941.65	3610.01	-18.51
	\$:	6.75	402.31	513.60	-21.67
	UV:		2.14	2.30	-7.02
	Q:	5.16	59292	70906	-16.38

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FR CUTTLE FISH	V:	3.72	1626.34	2009.79	-19.08
	\$:	3.73	221.97	286.40	-22.50
	UV:		3.74	4.04	-7.31
	Q:	5.32	61176	87631	-30.19
FR SQUID	V:	4.57	1998.90	2196.59	-9.00
	\$:	4.59	273.37	314.23	-13.00
	UV:		4.47	3.59	24.62
	Q:	7.45	85661	84417	1.47
DRIED ITEM	V:	2.63	1148.38	981.50	17.00
	\$:	2.63	156.94	140.81	11.46
	UV:		1.83	1.67	9.84
	Q:	0.38	4379	7287	-39.91
LIVE ITEMS	V:	0.55	239.69	324.26	-26.08
	\$:	0.55	32.72	46.43	-29.53
	UV:		7.47	6.37	17.26
	Q:	1.53	17622	21202	-16.89
CHILLED ITEMS	V:	1.09	477.99	631.84	-24.35
	\$:	1.09	65.14	90.34	-27.90
	UV:		3.70	4.26	-13.25
	Q:	12.43	142806	142638	0.12
OTHERS	V:	6.32	2764.02	2756.84	0.26
	\$:	6.34	377.78	397.77	-5.02
	UV:		2.65	2.79	-5.14
	Q:	100.00	1149341	1289651	-10.88
TOTAL	V:	100.00	43717.26	46662.85	-6.31
	\$:	100.00	5956.42	6678.69	-10.81
	UV:		5.183	5.179	0.07
	UV\$:		5.183	5.179	0.07

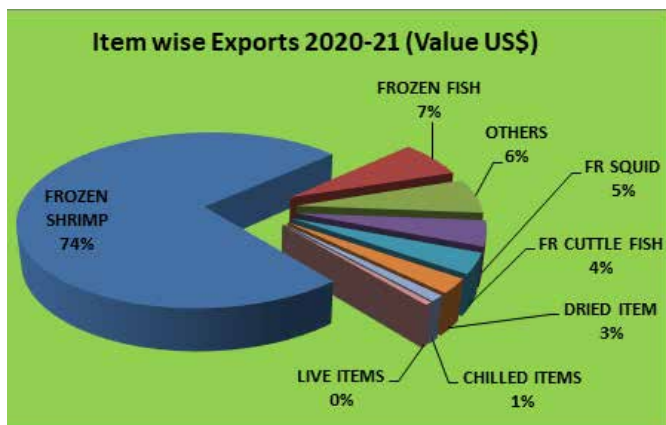


Figure.2 Exports 2020-21 (Value US\$)

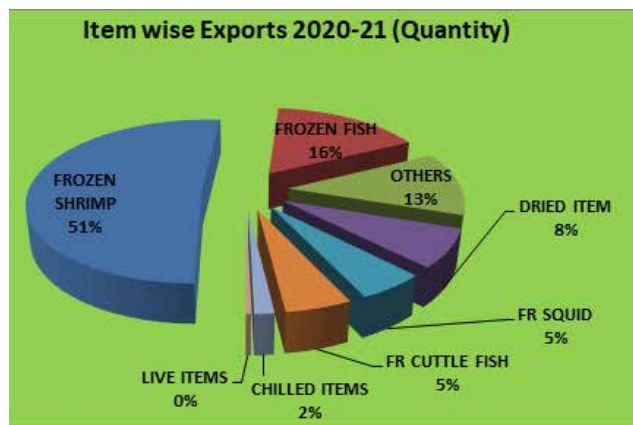


Figure.3 Exports 2020-21 (Quantity)

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Market wise export Details

USA retained the title as the major importer of Indian seafood with a share of 41.15% in terms of US\$. USA imported 2,91,948 MT of seafood in the financial year 2020-21. Export to USA showed a growth of 0.48 % in rupee value however declined by 4.34% and 4.35% respectively in quantity and US\$ value terms.

Frozen Shrimp continued to be the principal item exported to USA with a share of 95.63% in US\$ value. Exports of *Vannamei* shrimp to USA grew 6.75% in quantity, 13.16% in rupee value and 7.81% in US\$ terms. The Black Tiger Shrimp exports to USA went down by 70.96%, 63.33% and 65.24% in terms of quantity, rupee value and US\$ respectively.

China continued to be the second largest market destination for Indian Seafood with a share of 15.77% in US\$ earnings and 19% in quantity. China imported 2,18,343 MT of Seafood worth US\$ 939.17 million. The export to China has declined by 33.73%, 28.17% & 31.68% in quantity, rupee value and US\$ terms respectively. Frozen Shrimp was the major item of exports to China accounting a share of 46.64% in quantity and 61.87% in US\$ earnings.

European Union continued to be the third largest destination for Indian Seafood with a share of 13.80% in US\$. Frozen Shrimp continued to be the major item of exports to EU accounting for a share of 45.91% in quantity and 58.38% in US\$ earnings out of the total exports to EU. Export of frozen shrimp to EU decreased by 5.27% and 6.48% in quantity and US\$ value.

South East Asia is the fourth largest market destination of Indian marine products accounting for a share of 11.17% in US\$ terms. Overall exports to South East Asia declined by 2.56% in quantity 1.10% in rupee value and 5.73% in US\$ earnings.

Japan is the fifth largest destination for Indian Seafood with a share of 6.92% in USD earnings and 7.55% in quantity. Exports to Japan have shown a positive growth of 10.52% in quantity and 3.85% in rupee value.

However, US\$ earnings showed a decline of 2.42 %. Frozen Shrimp continued to be the major item of exports to Japan accounting a share of 46.68% in quantity and 76.88% in US\$ earnings. Exports of frozen shrimp to Japan increased respectively by 3.95% and 1.54% in quantity and rupee value respectively, but declined 3.94% in US\$ terms.

Middle East market had a share of 4.22% in US\$ earnings. This market has shown a decline of 15.30%, 11.34%, 15.51% respectively in quantity, rupee value and US\$ earnings. Frozen Shrimp was the major item of exports to Middle East as in the previous years, accounting a share of 72.23% in US\$ earnings.

The exports to Other markets showed a positive growth of 2.54% in terms of quantity, but decreased by 1.02% in rupee terms and 5.44% in US\$ earnings compared to the previous year. The share of other countries to the export basket was 6.98% in US\$ terms. Among other markets, Canada (35.89%), Russia (20.20%), Bangladesh (8.19%), Tunisia (6.64%), and Dominican Republic (3.68%) together contributed almost 75% share of the buy in US\$ terms.

Table.5: Market wise Export Details during April-March 2020-21

Q: Quantity in Tons, V: Value in Rs. Crore, \$: USD Million

Market		Share %	2020 - 21	2019 - 20	Growth (%)
JAPAN	Q:	7.55	86764	78507	10.52
	V:	6.94	3032.75	2920.28	3.85
	\$:	6.92	412.03	422.24	-2.42
USA	Q:	25.40	291948	305178	-4.34
	V:	41.15	17990.40	17904.37	0.48
	\$:	41.15	2451.04	2562.54	-4.35
EUROPEAN UNION	Q:	13.29	152770	165773	-7.84
	V:	13.78	6022.83	6136.71	-1.86
	\$:	13.80	821.84	876.47	-6.23

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CHINA	Q:	19.00	218343	329479	-33.73
	V:	15.80	6908.63	9617.44	-28.17
	\$:	15.77	939.17	1374.63	-31.68
SOUTH EAST ASIA	Q:	18.94	217686	223398	-2.56
	V:	11.15	4875.54	4929.90	-1.10
	\$:	11.17	665.53	705.99	-5.73
MIDDLE EAST	Q:	4.23	48606	57387	-15.30
	V:	4.22	1843.39	2079.12	-11.34
	\$:	4.22	251.13	297.23	-15.51
OTHERS	Q:	11.59	133223	129929	2.54
	V:	6.96	3043.72	3075.03	-1.02
	\$:	6.98	415.69	439.60	-5.44
Total	Q:	100.00	1149341	1289651	-10.88
	V:	100.00	43717.26	46662.85	-6.31
	\$:	100.00	5956.42	6678.69	-10.81



Figure.4 Exports 2020-21 (Value US\$)



Figure.5 Exports 2020-21 (Quantity)

Major Port wise Exports

Marine products were exported through 30 different sea/air/land ports. Vizag (Visakhapatnam), Calcutta (Kolkata), Kochi, Krishnapatnam, and JNP were the major ports through which exports were done. Major port-wise export details are given below. Vizag handled 28% of exports from India in US\$ terms.

Table.6: Port Wise Export Details during April-March 2020-21					
Q: Quantity in Tons, V: Value in Rs. Crores,\$: USD Million					
Ports		Share %	2020 - 21	2019 - 20	Growth (%)
VIZAG	Q:	18.83	216457	241783	-10.47
	V:	28.28	12362.71	13139.73	-5.91
	\$:	28.22	1681.20	1880.49	-10.60

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CALCUTTA	Q:	10.13	116419	128150	-9.15
	V:	11.70	5112.77	5308.02	-3.68
	\$:	11.68	695.84	760.90	-8.55
KOCHI	Q:	12.49	143552	146038	-1.70
	V:	11.43	4994.75	4904.49	1.84
	\$:	11.43	681.04	700.26	-2.74
KRISHNAPATNAM	Q:	5.59	64230	97708	-34.26
	V:	8.61	3762.21	5134.31	-26.72
	\$:	8.59	511.79	735.44	-30.41
J N P	Q:	9.09	104435	134766	-22.51
	V:	8.17	3569.81	4359.71	-18.12
	\$:	8.18	487.18	623.40	-21.85
PIPAVAV	Q:	16.17	185817	257402	-27.81
	V:	7.62	3330.90	4556.19	-26.89
	\$:	7.63	454.46	650.01	-30.08
CHENNAI	Q:	6.00	68973	51539	33.83
	V:	7.20	3147.48	2045.57	53.87
	\$:	7.22	430.21	292.97	46.84
TUTICORIN	Q:	4.12	47299	57159	-17.25
	V:	5.52	2414.66	2942.64	-17.94
	\$:	5.52	328.74	421.04	-21.92
MANGALORE/ICD	Q:	9.16	105278	95757	9.94
	V:	3.52	1539.45	1358.89	13.29
	\$:	3.54	210.64	197.74	6.52
KATTUPALLI/ ENNORE	Q:	2.73	31421	26174	20.05
	V:	3.51	1533.49	1220.50	25.64
	\$:	3.51	208.91	174.77	19.53
OTHERS	Q:	5.70	65459	53176	23.10
	V:	4.46	1949.05	1692.80	15.14
	\$:	4.47	266.40	241.69	10.22
TOTAL	Q:	100.00	1149341	1289651	-10.88
	V:	100.00	43717.26	46662.85	-6.31
	\$:	100.00	5956.42	6678.69	-10.81

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A. Production side:

1.Reduced fish landings due to less number of fishing days, and the uncertainty among the fishers regarding the prices as exporters have reduced the purchase of raw materials, citing slow logistic movements and market uncertainties.

2.Scarcity of laborers was a major issue in fishing and processing plants. Though aquaculture production was not affected, reduced logistics has affected the movement of consignments.

3.Scarcity of containers at seaports was the major issue in logistics coupled with increased freight charges.

4.Export of high value products like chilled and live products were significantly impacted due to the limited flight availability and high air freight costs.

5.Scarcity of packaging, labeling material, allied products and services were also observed.

B. Market Side:

1.**China:** In addition to container shortage, increased

freight charges, Covid-19 testing on the imported seafood consignments at the customs and local authority level increased the market uncertainties. Suspension of processing units with COVID positive results has created apprehension among exporters. But it is noticed from March 2021 onward the export situation is getting better.

2.**USA:** Due to scarcity of containers it was difficult for exporters to execute orders, in time. Closure of Hotel, Restaurant & Catering (HoReCa) segment also affected the demand.

3.**EU:** During the fiscal major EU countries has continued the locked down or movement restrictions. This has made the consumption in retail, restaurant, supermarkets and hotel sluggish. Feedback from importers indicates that Vietnam prices are much more competitive due to their Free Trade Agreement with EU.

4.**Japan:** Covid-19 lock down, restrictions, state of emergency in major cities are some of the factors that affected the demand and consumption.





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Sweet Chilli Shrimp Skewers



MPEDA RECIPE

Recipe Card

Indian Vannamei Shrimps (Freshly Peeled)	12 no.s
Pineapple Cubes	12 no.s
Chopped Garlic	One tablespoon
Red Chilly Flakes	One teaspoon
Refined Oil	Three tablespoon
Sweet Chilly Sauce	Six tablespoon

For Salad

Mixed Lettuce	150gm
Red Bell Pepper	30gm
Yellow Pepper	30gm
Red Onions	20gm
Lemon	1 no.s
Salt	to taste

Instructions

Thread shrimps and pineapple cubes on the skewer.

Marinate with oil, salt, pepper, chilli flakes and garlic.

Heat the oil in a pan and grill the skewers.

Once the shrimps cook, add sweet chilli sauce to the pan and coat the skewers well.

For the salad

Mix in the lettuce, bell peppers, tomato, onion, lemon juice and olive oil.

Spread the salad on a platter.

Serve the grilled skewers on it.

Prep time: 15 minutes

Cooking time: 15 minutes

Serves 2



Scan the QR code to watch the
recipe in Youtube

Implementation of square mesh cod ends at Harnai fish landing centre – A success story

Introduction

Harnai is one of the major fish landing centres in Maharashtra, situated in Dapoli Taluka of Ratnagiri district. Fishers mainly from Harnai, Pajpandhari and Utambar fishing villages operate their fishing boats from Harnai port. Fishing is the main source of business for people of Harnai and nearby areas. There are 562 mechanized fishing boats and seven non-mechanised fishing boats being operated from the landing centre (Source: Dept of Fisheries Annual Report 2017-18). Mechanised fishing boats mainly include trawlers and 10-15% gill netters.

About 59% of the fish catch comes from trawl fishing in Maharashtra. The minimum mesh size of the cod end used in the state is 18mm and is diamond shaped mesh. Diamond meshes get shrunk during hauling and it carries a lot of juveniles and less marketable size fishes, leading to resources the depletion of marine fishery. To minimize juvenile fishing Maharashtra Government in 2017 has made square mesh cod ends mandatory in trawls, but their implementation remained unsuccessful due to several reasons.

As per ADF department Notification dated 10.01.2017, Govt. of Maharashtra made amendment in Maharashtra MFRA as no trawl gear having less than 40 mm square mesh cod end, shall be operated by any mechanized fishing vessels.

Intervention by NETFISH in Harnai

Since 2008, NETFISH has been conducting extension activities in the Harnai area on fish quality management and conservation aspects. Efforts for the implementation of square mesh cod end in trawls was initiated in Maharashtra in the year 2011, when all the State Coordinators of NETFISH were familiarized with the CIFT Technology of conversion of diamond mesh net to square mesh nets by providing hands on training at CIFT Kochi during 27th September 2011 to 1st October 2011. Thereafter concerted efforts were set off to transfer this technology at grass root level by conducting awareness programmes on efficacy of

square mesh cod ends, hands on training on fabrication of square mesh cod ends from diamond mesh nets.

Popularization of square mesh cod end and fabrication technique were done during each and every programme on “Fish quality management and Conservation of Marine resources & Sustainable Fishing” as well as during onboard training programmes conducted since October 2011. About 238 such training programmes were arranged during the period from 2011 to 2020, including hands on training for net menders on fabrication of square mesh cod ends.



State Coordinator, describes the advantages of square mesh cod end during the training onboard



Popularizing the square mesh cod ends through the landing centre based programme

Square mesh fabrication training

Though the government had made square mesh cod end mandatory in trawl fishing, availability of ready-made square mesh nets in the field/markets was scarce. Therefore, fishermen and net mending people

COVER STORY

were trained to make square mesh nets by converting the existing diamond mesh nets by way of special cutting and sewing technique formulated by CIFT.

Hands on training programmes were conducted on fabrication of square mesh cod ends from diamond mesh webbings exclusively for net makers in Harnai area, in which importance of square mesh cod ends, advantages of square mesh cod ends and disadvantages of diamond mesh cod ends were explained to the trainees. Then the technique of cutting and sewing to convert diamond meshes to square meshes was demonstrated to them and thereafter they were made to prepare square mesh net samples by their own.



Hands-on training programmes for fishers/net menders on fabrication of square mesh cod end

Onboard fishing trials for the popularization of square mesh cod end

To popularize the use of square mesh cod ends among trawler boat owners, crew members and captains, onboard fishing trials were organized so as to show them the advantages of square mesh cod ends such as escapement of juvenile fishes, fuel savings and better appearance and quality of the catch. Since the Maharashtra MFRA proposed 40 mm square mesh cod ends, onboard trials were carried out using 40

mm square mesh cod ends with an outer cover of 25 mm diamond mesh cod end to evaluate the quantity of small fishes and juveniles escaped through 40 mm square mesh cod end. The trainees were convinced by seeing the difference of catch in square mesh and diamond mesh cod ends.



Conducting fishing trials using square mesh cod ends and evaluating the catch

Further, NETFISH popularized that minimum 40 mm square mesh cod end is mandatory in trawl fishing as per Maharashtra MFRA and that the Department of Fisheries is providing 90% subsidy for square mesh cod ends. Continuous meetings were held with fishermen co-operative societies and boat owners in Harnai area in this regard and they were urged to purchase square mesh cod ends by making use of the subsidy.

Outcome of NETFISH effort

Due to the continuous effort of NETFISH, during February 2020, boat owners and crew members of fishing vessels in Harnai finally came forward to adopt square mesh cod ends. Two Fishermen Co-operative Societies viz., Sriram Machhimar Sahakari Society Ltd.



Distribution of square mesh cod ends at Harnai



Fishers at Harnai with the square mesh cod ends

and Omkar Machhimar Sahakari Society Ltd. decided to purchase 100 square mesh cod ends and later on, another major fishermen society named Harnai Paj Fishing Trading Credit Co-operative Society Ltd., Harnai also came forward to purchase 100 square mesh cod ends. NETFISH helped them to apply for the subsidy scheme and contact the suppliers as well as the department officials concerned for availing the square mesh cod ends under the department's subsidy scheme.

The State Coordinator frequently communicated with Matsyafed as well as Tufropes company officials for the supply of square mesh cod ends. During November 2020, purchase order was placed with Tufropes Company, Mumbai for the supply of 150 numbers of 40 mm square mesh cod ends in Harnai.

A total of 300 square mesh cod ends were purchased in Harnai during January and February, 2021 by Fishermen Co-operative Society and Chogale Traders,

Harnai. Boat owners collected these cod ends from these two agencies. These square mesh cod ends were distributed to boat owners in the presence of NETFISH State Coordinator and NGO members.

At present, since only few vessels are going out for fishing, the exact result of the programme would be known only in the next fishing season (after July) ie after the fishing ban period.

This is the first time in the country that 300 fishing vessels are going for square mesh cod ends and it would definitely be a great stride in the conservation of fish resources which others can emulate.

Challenges

Though NETFISH has convinced the trawler owners of Harnai to buy and use square mesh cod ends, prevailing illegal fishing practices such as fishing by high speed trawlers from other states within territorial waters of Maharashtra, LED light fishing, purse seine fishing in territorial waters during banned periods, etc. create negative impact on the morale of fishermen who wanted to use square mesh cod ends.

Also the fish meal and fish oil industry purchase small size fish and trash and therefore the fishers tend to catch small size fish to earn some additional income.

The above issues need to be resolved for the effective use of square mesh cod ends by the trawl boats.



Scan the QR code to watch Video on Why fishermen should start using Square mesh cod ends for fishing.



Genetically Improved Farmed Tilapia: A boon for aqua farmers

RGCA GIFT Tilapia Project achieves seed production of 10 million in 2020-21

The Marine Products Export Development Authority (MPEDA) established India's first Nucleus Breeding Centre for GIFT (Genetically Improved Farmed Tilapia) in 2012 at Manikonda Village, Unguturu Mandal, Krishna District, Andhra Pradesh, in association with WorldFish, Malaysia. The project is aimed at promoting culture of short seasonal fish species ie. GIFT among hinterland/inland farmers. GIFT has high export potential owing to its meat quality and taste and consumer preference. The project is successfully operating with a pedigree linked family-based selective breeding programme by procuring genetically-improved Germplasm from WorldFish, Malaysia and has reached 9th generation of GIFT in Indian climatic condition.

Let's look at some important aspects of the project:

- The large scale production of seeds started from 2012-13 and during 2012-13 the project produced 1,75,300 all-male seeds and supplied to 5 beneficiaries.
- The production level has increased drastically and during 2020-21, the project achieved a massive production of 10 million all-male seeds, which was supplied to 1,678 beneficiaries all over India.
- The farmers from Kerala are the major consumers of the seeds produced in this facility and farmers from Maharashtra, Tamil Nadu, Andhra Pradesh, Karnataka and Telangana are regular buyers of GIFT seed from the project.
- The project has the privilege of supporting projects of ICAR and other research institutes and also supports demonstration projects of MPEDA.
- The GIFT seeds are supplied to farmers of Kerala through the Department of Fisheries, Kerala directly from the Manikonda project and from the Multi-species Aquaculture Complex Project established at Vallarpadam, Kochi.
- The project has taken a leap forward in supporting two Satellite Breeding Centers operated by Department of Fisheries, Govt. of Tamil Nadu; one at Krishnagiri and another at Manjalar Dam.

■ The project is also supporting GIFT hatcheries operated by Dept. of Fisheries, Govt. of Kerala and Dept. of Fisheries, Govt. of Odisha and hatchery operated by RGCA- MPEDA at Multi-species Aquaculture Complex Project (MAC), Kerala. The project has supported a GIFT hatchery operated by FISHCOPFED, Rajasthan.

■ Private entrepreneurs are also provided with technical support and germplasm for setting up hatcheries and 9 private entrepreneurs - 2 in Tamil Nadu, 4 in Maharashtra and 2 in Karnataka and 1 in Kerala have signed MoU with RGCA for setting up of GIFT hatcheries.

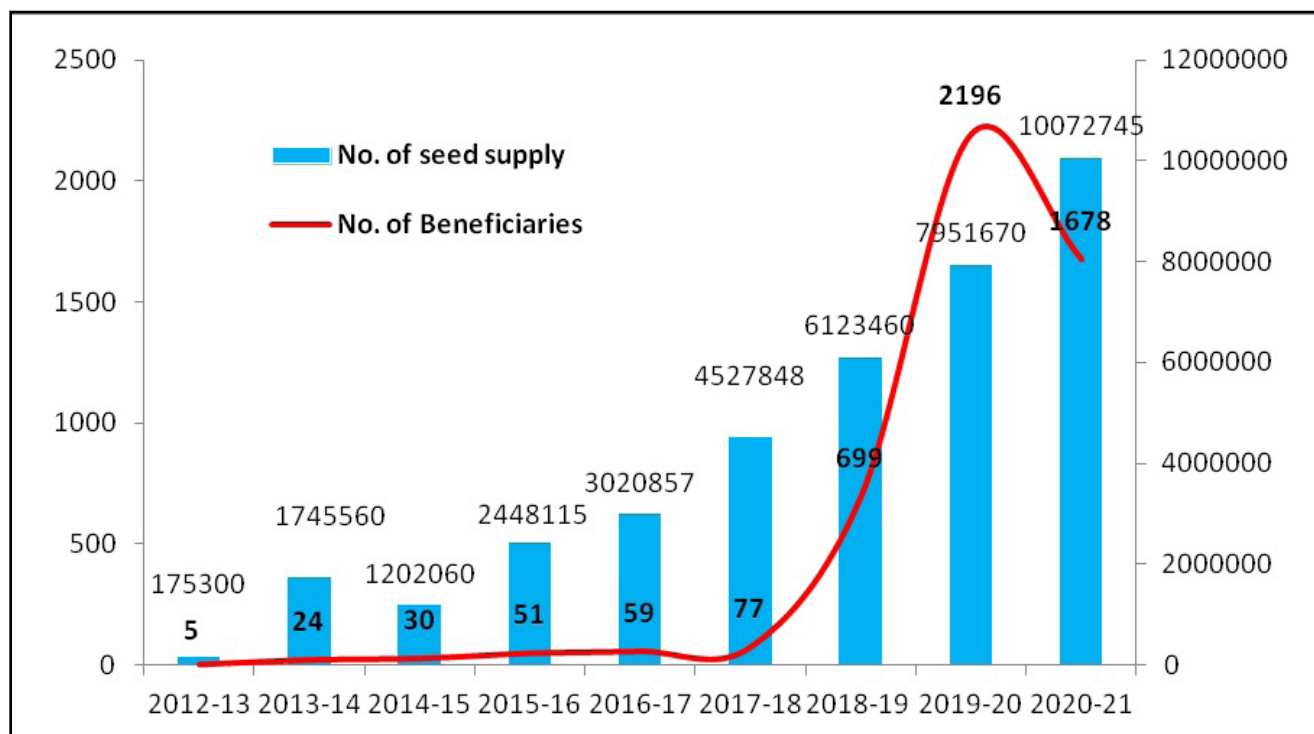
■ All the families and seeds produced from this project is thoroughly screened for TiLV (Tilapia Lake Virus) and certified as clean stock by NABL Lab of RGCA.

Major achievements of the project

- 10 million all male GIFT seeds produced in a year and supplied to farmers.
- From 2012-13, 32.27 million GIFT seeds have been produced and supplied to around 5000 beneficiaries across the country.
- The possible output from the project is around 1550 MT of GIFT Tilapia production in 1970 Ha of hinterland area, generating income of around Rs. 250 crores besides generating huge employment opportunities to the rural poor.

Mr. K.S. Srinivas IAS, Chairman, MPEDA, who is also the President of RGCA, appreciated the GIFT Tilapia Project Team for achieving the 10 million production of all-male GIFT seeds during 2020-21, despite the COVID-19 situation. He also informed that GIFT fish is a boon for hinterland farmers and this project will play a great role in increasing the production of export-oriented fish from hinterland and inland areas. Dr. M. Karthikeyan, Director, MPEDA appreciated the efforts taken by RGCA to promote the inland aquaculture by providing high quality GIFT seeds to the farmers and broodstock fries to the hatchery operators and Satellite Breeding Centres in India. Mr. K.S. Pradeep, IFS, Secretary, MPEDA extended his greetings to the GIFT Tilapia Team for this achievement. The Project Director RGCA appreciated the persistent efforts taken by the Tilapia project team and lauded the achievements made.

AQUACULTURE SCENE



Graph on the number of GIFT seeds supplied over the decade.



RGCA team explains about the GIFT fry to Chairman MPEDA



Chairman MPEDA observes the GIFT fry



RGCA GIFT team

AQUACULTURE SCENE



Discussion on hormonal feed for GIFT fry



Director, MPEDA & RGCA officials hold GIFT broodstock



Briefing to Chairman, MPEDA on GIFT broodstock



GIFT cohort at Tilapia project



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For the Better

Bring harmony to your aquarium with Tetras



V. K. Dey

V K Dey has over three decades of experience in diverse sectors of seafood industry in Asia-Pacific region. He was the Deputy Director of MPEDA and then associated with INFOFISH, Malaysia. As part of INFOFISH, he was involved in several studies related to seafood industry in the Asia-Pacific region and beyond, including setting up of Aqua-technology Park for ornamental fish. MPEDA has published Living Jewels, a collection of his articles on ornamental fish.

Tetras are probably one of the most popular and common groups of tropical fishes. They are from tropical America, belonging to the family Characidae. They are peaceful and pose no threat to any other fish in the aquarium and are ideal for a community aquarium with other fish of similar disposition. They feed on all kinds of live and flake foods. There are ten varieties of tetras known. All the tetras prefer well-planted tanks with dark bottoms and move in large schools.

The Neon Tetra (*Paracheirodon innesi*), from the streams of the Peruvian Amazon, looks pleasing to the eye if kept in a school of more than 40 fish. The colourful part of their body is dark maroon and they have a thin bluish-green stripe, extending the length of their body.

The female is larger than the male and wider in proportion. The stripe is straight in the male while it is slightly crooked in the female. They prefer heavily planted aquaria with reduced light to breed. The water should be soft with temperature ranging from 73 - 74°F and pH 6.5. Only one breeding pair should be used at a time. Since young ones are very sensitive to light, the tank should be kept away from direct sunlight until their eyes are completely developed.

The Cardinal Tetra (*Paracheirodon axelrodi*) is originally from slow moving waters in Venezuela, Colombia and Brazil. This fish should be kept in small schools of more than 6 individuals. Although it resembles the Neon tetra, they are actually from two different species. Spawners are conditioned by giving live brine shrimp nauplii and kept in dimly lit tanks with floating plants. They prefer soft acidic water. The pH is reduced to 5.8 and the temperature raised to 76 - 77°F to get better spawning results. Eggs are usually laid in the evening. The parents must be removed after spawning.

The Black Neon (*Hyphessobrycon herbertaxelrodi*) is a native of South America. Breeding is reported to be difficult as live feed and soft acidic water is required to stimulate the fish to breed. It feeds on flake foods, adult brine shrimp, blood worms and other live food. The ideal temperature is between 74 – 80°F. Although called the Black Neon, it is not a neon tetra, but a completely different species.

The Black Tetra (*Gymnocorymbus ternetzi*) is easy to breed. However, the spawners need to be conditioned by giving live feed, particularly brine shrimp nauplii or frozen blood worms. The ideal water temperature is 68 – 78°F with pH of 6 – 8.3. The female is a little wider and its anal fin is narrower and runs parallel with its second vertical line. Several varieties are being bred but the most common has a long fin.

The Bleeding Heart Tetra (*Hyphessobrycon erythrostigma*) originates from the Amazon River. They feed on flake foods, adult brine shrimp, blood worms and other live food. The male has an extended black dorsal fin. Breeding of this tetra in captivity has not been successful so far. The ideal temperature ranges from 74 – 82°F, while the pH is 5.7 – 7.2.

The Bloodfin (*Aphyocharax anisitsi*) is a native of Argentina. The male has a small hook on its anal fin. Spawners should be conditioned with live feeds like brine shrimp or bloodworms. The parents should be removed after the eggs have been laid. The ideal temperature ranges from 68 – 80°F with water pH of 6 – 8. The adult size is very small compared to other tetras.

The Glowlight Tetra (*Cheirodon erythronus*), a native of Essequibo river in Guyana, is reported to be difficult to breed. It prefers heavily planted poorly lit tanks. Water should be exchanged frequently, about 25% a week. They spawn in warmer water (82°F) with medium hardness and pH 6.5. Only one breeding pair is kept at a time. Spawning takes place over several hours as one egg is laid at a time. Parents should be removed after spawning.

The Head and Tail Light Tetra (*Hemigrammus ocellifer*), from French Guiana, is another tetra which is easy to breed. They prefer water with pH 6.3 – 7 and a temperature of 74 – 78°F.

The Lemon Tetra (*Hyphessobrycon pulchripinnis*), found in the shallow rivers of Brazil, is difficult to breed in captivity. It prefers warmer water of 82°F of pH 6.5. Weekly change of water of about 25% is recommended.

The Serpae Tetra (*Hyphessobrycon callistus*), is the easiest to breed. Females are slightly larger and wider. The water should be of medium hardness with temperature of 80°F and pH 6.8. Only one breeding pair is used at a time.



National Residue Control Plan - NRCP

The monitoring mechanism to ensure seafood safety

Dr Ram Mohan M.K., G. Mahesh & Dr M. Karthikeyan
The Marine Products Export Development Authority, Kochi -36.

Introduction

Quality plays a paramount role in seafood exports. The importing nations impose stringent regulations for importing seafood into their country. The presence of residues of banned antibiotics in farmed shrimps has become a major impediment to the seafood trade to markets like EU, Japan and US. The consignments detected with banned antibiotic residues are rejected by importing nations. The table below depicts the details of rejection of Indian seafood consignments in major markets with special reference to antibiotic residues.

Table 1. Details of rejection of Indian seafood consignments in major markets

Year	Rejections							
	EU		USA		Japan		Total	
	Total	Antibiotic	Total	Antibiotic	Total	Antibiotic	Total	Antibiotic
2015	17	5	43	15	9	7	69	27
2016	27	5	61	28	3	3	91	36
2017	39	15	47	3	7	6	93	24
2018	37	13	52	8	5	4	94	25
2019	11	4	30	6	5	5	46	15
2020	13	4	71	11	5	5	89	20
2021*	11	1	22	5	1	1	34	7

* as on 30 April 2021

(Source: EIC/MPEDA/USFDA)

Though the number of rejections in EU and Japan due to antibiotic residues remained the same in 2019 and 2020, there has been a substantial increase in the number of refusals and rejections recorded by the US market in 2020 compared to previous year. The

continued rejection of Indian seafood in major markets due to the presence of banned antibiotic substances emphasizes the need for continuous monitoring of the system to ensure that the seafood that leave the shores of India.

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National Residue Control Plan (NRCP)

National Residue Control Plan (NRCP) is a statutory requirement under EU Council Directive 96/23/EC for export of marine products to the European Union, which needs to be compulsorily implemented by the countries exporting to EU member states. For aquaculture products, NRCP is a pre requirement to ensure proper control on the quality of fish & fishery products exported. This programme was started in 1998 as Residue Monitoring Plan (RMP), which was later renamed as National Residue Control Plan during 2003.

The Marine Products Export Development Authority (MPEDA) has been delegated by the Ministry of Commerce & Industry vide notification SO No.1034(E) dated 9th September 2003 to carry out the residue monitoring activity under NRCP on behalf of the Competent Authority, the Export Inspection Council of India (EIC).

The conceptualization, planning and implementation of NRCP is being undertaken by MPEDA using its network of Quality Control Laboratories at Kochi, Nellore, Bhimavaram and Bhubaneswar.

Objectives of NRCP

- To establish a system for monitoring the residues of Aquaculture drugs/Veterinary Medicinal Products and Environmental contaminants etc. in shrimp, scampi, fresh water fish, hatchery seed and feed samples drawn from aquaculture farms, feed mills, hatcheries and processing establishments.
- To establish a system of corrective action in the event of detection of residues/contaminants higher than the prescribed limits.
- To ensure that the aquaculture products exported from India meet the prescribed regulatory requirements of the importing countries/EU.

Scope of NRCP

The scope of NRCP includes all aquaculture farms, processing establishments, feed-mills and hatcheries linked to and/or intended for export oriented production of aquaculture products; and the testing and certifying laboratories, in order to ensure overall monitoring of the

aquaculture products at different stages of production to guarantee safe products from farm to table.

Conceptualizing, Planning and Implementation of NRCP

a.Sample size: The number of samples to be analysed in a given year is decided based on the previous year's production data of Aquacultured Shrimp/Scampi/Fish. Samples from hatchery and feed mills are decided based on the number of units under operation. The targets arrived at are allocated to MPEDA unit offices located in all maritime states for collection under NRCP for that year.

b.Sample collection: The samples under NRCP are collected by the designated Residue Monitoring Officers (RMOs) of MPEDA from MPEDA enrolled / Coastal Aquaculture Authority(CAA) registered farms and hatcheries, processing plants and feed mills.

The RMOs collect the samples as per the monthly target/schedule assigned to different offices and forward the same to the concerned laboratories of MPEDA at Cochin, Nellore Bhimavaram and Bhubaneswar. The collection of sample is unforeseen, unexpected and effected at no fixed time and on no particular day of the week as per the requirement of EU Council Directive 96/23/EC.

c.Sample analysis: On receipt of samples, MPEDA QC labs carry out analysis of samples for the allotted parameters. The test results are communicated to the field offices electronically by the MPEDA Labs.

In case of positive test results, separate alert information is generated automatically by the system and sent to the Export Inspection Council of India, Coastal Aquaculture Authority, Seafood Exporters Association of India (SEAI) and concerned field offices of MPEDA, concerned Export Inspection Agency (EIA) and State Dept. of Fisheries in electronic format.

Parameters analysed under NRCP

Two main groups of parameters are analysed under NRCP viz., Antibacterial Group A Substances and Antibacterial Group B Substances. The details of parameters covered under each group are detailed in table 2a and 2b below:

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Table 2a. Group A substances having anabolic effect and unauthorized substances

Sl. No.	Substances/Group	Parameters
1	Stilbenes(A1)	Diethyl Stilbestrol Dienestrol Hexestrol
2	Steroids (A3)	17-Beta Estradiol Progesterone & Medroxy Progester- one acetate
3	Compounds included in Annex IV to Council Regulation (EEC) No 2377/90 (A6)	Chloramphenicol Nitrofurans Metabolites (4) Nitroimidazoles (7)

Table 2b. Group B Veterinary drugs and Environmental contaminants

Sl. No.	Substances/Group	Parameters
1	Antibacterial substances (B1)	Tetracyclines with 4-Epimers (3 x 2) Sulfonamides (11) Quinolones/Fluro-quinolones (9) Macrolides (4) Beta Lactams (7) Lincosamide Diaminopyrimidines Doxycycline Cephalosporins (2)
2	Anthelmintics (B2a)	Ivermectin Emamectin
3	Organochlorine compounds including PCBs (B3a)	DDT (2) DDE (2) DDD (2) BHC Isomers (3) Aldrin Dieldrin Endrin Heptachlor Heptachlor Epoxide Chlordane (3) HCB Poly-chlorinated Biphenyls (6 PCBs)
4	Chemical Elements (B3c)	Mercury (Hg) Cadmium (Cd) Arsenic (As) Lead (Pb)
5	Mycotoxins (B3d)	Aflatoxin B1 & B2 (2)
6	Dyes (B3e)	Malachite green Leuco-malachite green Crystal Violet Leuco - Crystal Violet

A total of 96 parameters in 2 groups are analysed annually, of which 18 are under Group A and 78 are under Group B. There are 3 subgroups under Group A and 6 subgroups under Group B.

Further, the FVO Mission to India in 2017 has instructed to include and analyse samples for 18 additional parameters under NRCP. The additional parameters are listed in Table 3. MPEDA QC lab personnel in Kochi had successfully developed and validated methods for analysis of 16 parameters other than Spectinomycin and Neomycin. Cloxacillin had no reference method in shrimp matrix. The method development for Spectinomycin and Neomycin are under progress.

Table 3. Additional veterinary medicinal products covered under NRCP

Sl. No.	Name of Group	Parameter
1	Macrolides	1) Erythromycin A
		2) Tilmicosin
		3) Tylosin
		4) Spiramycin
		5) Spectinomycin
		6) Neomycin
2	Beta Lactams	1) Ampicillin
		2) Benzyl Penicillin
		3) Dicloxacillin
		4) Oxacillin
		5) Cloxacillin
		6) Colistin
		7) Amoxicillin
3	Lincosamides	1) Lincomycin
4	Diaminopyrimidines	1) Trimethoprim
5	Doxycycline	1) Doxycycline
7	Cephalosporins	1) Cefalexin
		2) Cefapirin

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Sampling pattern for NRCP

The sampling levels and frequencies depend on the production of farmed Shrimp / fish in tons. The minimum number of samples to be collected each year must be at least 1 per 100 tons of annual production. The compounds sought and the samples selected for analysis should be selected according to the likely use of these substances during farming period.

The following breakdown must be respected in sampling:

Antibacterial Group A Substances: One third of the total samples (all these samples must be taken at farm level).

Antibacterial Group B Substances: Two thirds of the total samples, the sampling should be carried out:

(a) Preferably at the farm, on Shrimp / fish ready to be placed on the market for consumption;

(b) Either at the processing plant, or at wholesale level, on fresh fish, on condition that tracing-back to the farm of origin, in the event of positive results, can be done. In all cases, samples taken at farm level should be taken from a minimum of 10% of registered sites of production.

Performance under NRCP

The details of performance under NRCP since 2003 are given in the table 4 below. It could be seen that 62233 samples were analyzed under the plan up to 2020 and the average positivity rate is 2.61%.

The positivity rate has recorded less than 1% for the past 2 years. 3641 samples were analyzed under RMP during 1998-2002 with 23 positive samples altogether.



Table 4. Performance under NRCP over the years.

Year	No. of samples Tested	Positives	% positivity
2002	1369	3	0.22
2003	2360	25	1.06
2004	2019	73	3.62
2005	1504	117	7.78
2006	1777	90	0.00
2007	2005	117	5.84
2008	855	20	2.34
2009	1427	30	2.10
2010	2017	75	3.72
2011	2678	95	3.55
2012	2772	178	6.42
2013	3001	242	8.06
2014	3546	240	6.77
2015	4496	59	1.31
2016	4816	105	2.18
2017	5404	67	1.24
2018	5774	77	1.33
2019	6923	50	0.72
2020	7490	53	0.71
Total	62233	1716	2.76

(Source: MPEDA)

Year-wise analysis trend from different sample sources between 2010-2020 are depicted in Fig. 1. Farmed Shrimp being the principal export commodity from India, has the risk of contamination by banned antibiotic residues and other contaminants. Hence, the majority of the samples comprise of shrimp samples collected from farms and seafood processing establishments. Shrimp seeds are sampled from hatcheries. Besides this, fish and scampi samples are also collected and analysed.

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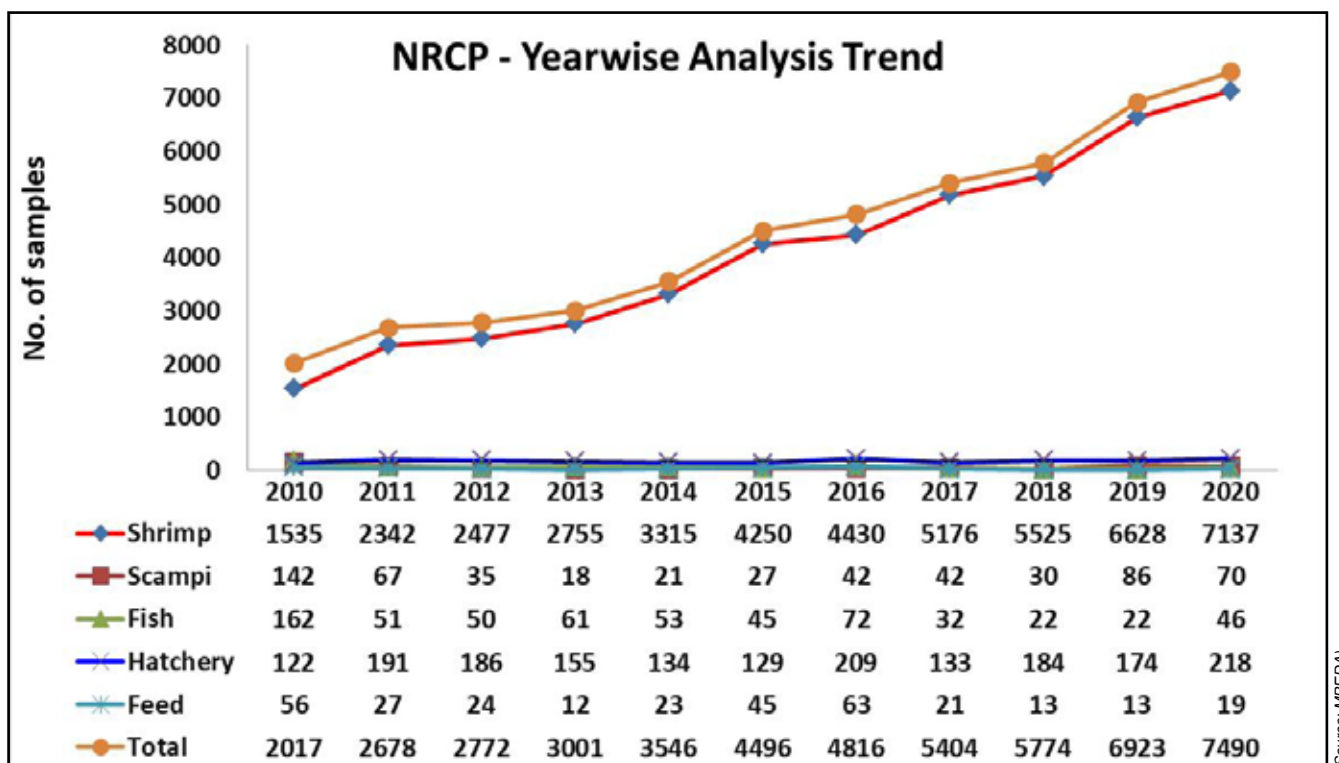


Fig. 1. Year-wise analysis trend from different sample sources between 2010-2020

From table 5, it could be seen that there had been 100% achievement in collection and analysis of samples from aqua farms, feed mills and processing units. The collection and analysis of samples from hatcheries have shown remarkable improvement in 2020 compared to previous years.

Table 5. Performance of NRCP during the last three years

Source	2018			2019			2020		
	Target	Achieved	%	Target	Achieved	%	Target	Achieved	%
Farm	3787	3768	99.50	4566	4517	98.93	4819	4848	100.60
Processing plants	1880	1809	96.22	2266	2219	97.92	2391	2405	100.58
Hatchery	336	184	54.76	340	174	51.18	283	218	77.03
Feed Mill	13	13	100.00	13	13	100.00	19	19	100.00
Total	6016	5774		7185	6923		7512	7490	

Positivity Rate: The positivity rate for samples collected during 2019 and 2020 for Group A and Group B substances are tabulated in Table 6. It could be seen that all the 18 positive samples from farms pertain to Group A substances in 2019. The number of positives from farms came down to 7 in 2020 and among this 6 were reported to belong to Group A substances. There were no positive results in the samples from processing establishments in 2019, while there were 2 cases in 2020, and none of which belong to Group A

substances. No positive results were recorded in feed samples.

32 out of 174 hatchery samples tested positive in 2019 with a positivity rate of 18.39%, and all of them were for Group A substances. In 2020, the positivity rate increased to 20.18% as the number of positive samples increased to 44 out of 218 samples collected and analysed, and all were detections for Group A substances

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Table 6. Positivity rate for Group A and Group B substances: 2019- 2020

Sl No	Source	2019					2020				
		Target	Tested	+ves	%	Gr A +ves	Target	Tested	+ves	%	Gr A +ves
1	Farm	4566	4517	18	0.39	18	4819	4848	7	0.14	6
2	Processing unit	2266	2219	0	0	0	2391	2405	2	0.08	0
3	Hatchery	340	174	32	18.39	32	283	218	44	20.18	44
4	Feed mill	13	13	0	0	0	19	19	0	0	0
	Total	7185	6923	50	0.72	50	7512	7490	53	0.71	50

(Source: MPEDA)

Given the larger proportion of shrimp samples in the total samples analyzed, the positivity rate is also influenced by the sample size of shrimps and shrimp seeds. The trends in the source-wise number of samples detected positive during 2010-2020 are depicted in Fig 2. It could be seen that the positive results from the hatchery are influencing the total positivity rate for the samples drawn and analyzed. However, the number of positives is declining since 2017, which is a sign of encouragement. Though there is tremendous improvement the results of aquaculture farms, majority of the positive rejections come from hatcheries and this remains as a major concern

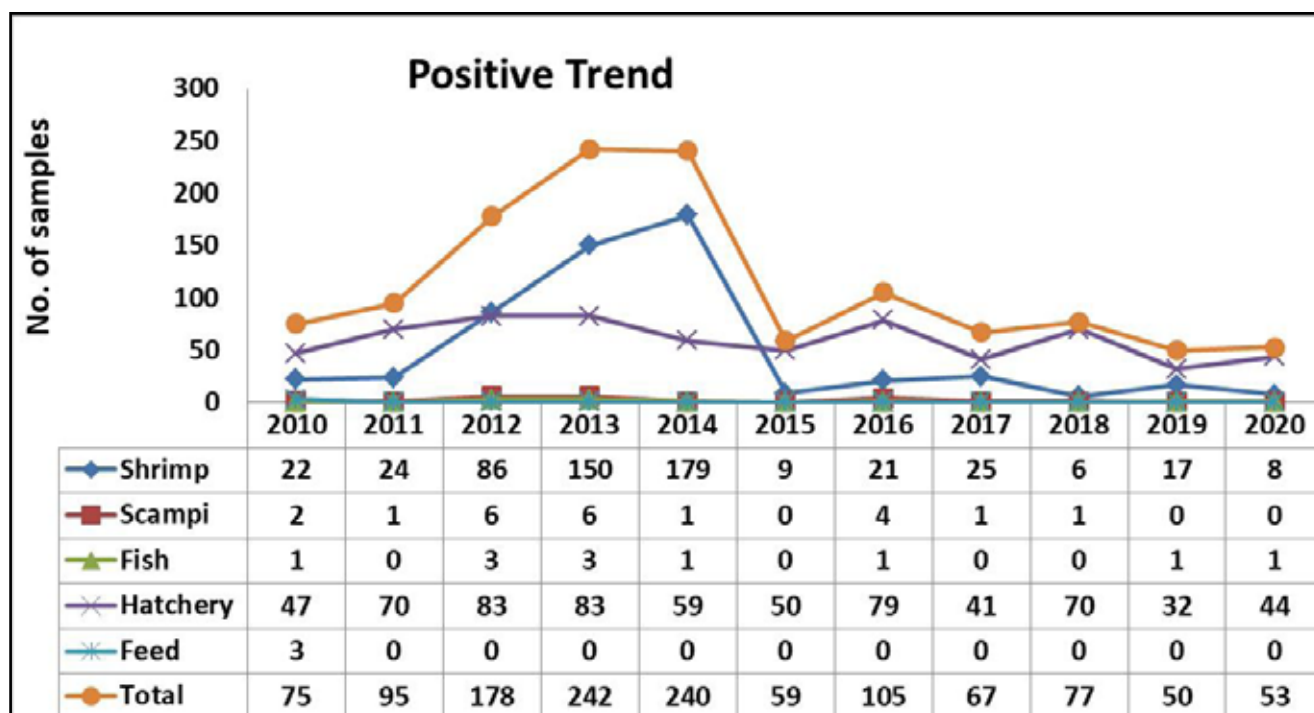


Fig. 2. Source-wise number of samples detected positive during 2010-2020

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MPEDA Quality Control Laboratories

MPEDA has set up a network of 5 Quality Control Laboratories at Kochi, Bhimavaram, Nellore, Bhubaneswar and Porbandar. NRCP is handled by the Quality Control Laboratories at Kochi, Bhimavaram, Bhubaneswar & Nellore. The details of MPEDA Quality Control Laboratories associated with NRCP are given in Table 7.

Table 7. Details of MPEDA Quality Control Laboratories associated to NRCP

1	MPEDA Quality Control Laboratory, Kochi 5 th Floor, MPEDA House Panampilly Avenue, Kochi – 682 036, Kerala, India. Tel: +91-484-2311901 / 2311803 E-mail: lab.koc@mpeda.gov.in
2	MPEDA Quality Control Laboratory, Bhimavaram Trinethra Complex, Pattabhi Plaza, 2 nd floor, Juvalpalem Road, Bhimavaram-534 202, West Godavari Dist. Andhra Pradesh, India. Tel: +91-8816-226410 /297410. E-mail: lab.bhi@mpeda.gov.in
3	MPEDA Quality Control Laboratory, Nellore D.No.26-I-1766/A1, Srinagar colony, Mini Bypass Road, Nellore- 524 003, Andhra Pradesh, India. Tel: +91-861- 2319144 E-mail: lab.nel@mpeda.gov.in
4	MPEDA Quality Control Laboratory, Bhubaneswar 2 nd Floor, RaptaniBhavan Near ID Market, IRC Village, Nayapalli Bhubaneswar-751 015, Odisha, India. Tel: +91-674-2362365 E-mail: lab.bhu@mpeda.gov.in

Accreditation / approval of Laboratories

MPEDA QC Laboratories are accredited by the National Accreditation Board for Testing and Calibration Laboratories (NABL), member of International Laboratory Accreditation Co-operation (ILAC), as per the ISO/IEC 17025:2017 standard. The scope of accreditation covers testing of fish and fishery products



for chemical residues. The Laboratories are also approved by the Export Inspection Council of India for testing of fish and fishery products intended for export.

Level of competence of the MPEDA Laboratories

The MPEDA QC Laboratories are equipped with high precision sophisticated equipments like Liquid Chromatography Tandem Mass Spectrometer (LC-MSMS), Inductively Coupled Plasma - Mass Spectrometer (ICP-MS), High Performance Liquid Chromatograph (HPLC), Gas Chromatograph (GC-ECD), Gas Chromatograph - Mass Spectrometer (GC-MS / GC-MSMS), etc and all necessary supporting equipment/instruments to perform analysis under NRCP to provide accurate results without compromising on the principles laid down for accredited laboratories. MPEDA laboratories participate in national and international Proficiency Test (PT) programmes and Inter Laboratory Comparison (ILC) programmes to comply to the norms prescribed under NABL accreditation.

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Conclusion

Production and export of quality seafood free from banned antibiotic residue is essential to retain our market share in International markets. MPEDA is implementing NRCP for over two decades religiously following the norms prescribed as per EC directives despite field level challenges.

The findings as per NRCP are filed regularly to the Export Inspection Council of India within the stipulated time frame for further filing to the European Commission. The information filed under NRCP is quite important in shaping the policy decisions of EU on India's seafood trade to the European market. NRCP also helps regular monitoring of the hatcheries, farms and feed mills that

contribute to the coastal aquaculture production of the country and the seafood samples handled by the processing units. NRCP positive results are conveyed to different agencies such as Export Inspection Agency, Coastal Aquaculture Authority, State Department of Fisheries and the Seafood Exporters Association of India, besides to the entity from where sample is taken.

This helps to bring more awareness among the stakeholders about the contaminants and equip them to take precautionary measures to avoid contamination. This in turn benefits the value chain in ensuring that the seafood produced and exported from India are residue free, enhancing the brand image of Indian seafood abroad.



MPEDA QC Lab Porbandar gets NABL accreditation

MPEDA inaugurated its new QC Lab at Porbandar to test seafood on 15th August 2020. The lab has validated methods for 17 parameters, which includes 11 Group A antibiotics and 6 Chemical elements into newly installed LCMSMS and ICP MS equipments. Based on the integrated assessment held on 20th and 21st March 2021 as per ISO/IEC 17025:2017 and EIC requirements, the lab was recommended by assessors for granting of accreditation by NABL.

NABL has granted accreditation to MPEDA QC lab, Porbandar on 7th May 2020. 5 samplers catering to the jurisdiction of Gujarat and Maharashtra also have been assessed and approved.

Lab also took part in two Inter Laboratory Comparisons and two Proficiency Test programmes and achieved satisfactory z scores. The lab is ready for testing of 17 parameters in seafood as mentioned below.

Sl. no.	Materials or Products tested	Component, parameter or characteristic tested / Specific Test Performed / Tests or type of Test Performed	Range of Testing / Limits of Detection
1.	Crustacean and Fish	Chloramphenicol	0.1 µg/kg to 50 µg/kg, LOD: 0.1 µg/kg
2.	Crustacean and Fish	Nitroimidazole- HMMNI	1.38 µg/kg to 50 µg/kg, LOD: 1.38 µg/kg
3.	Crustacean and Fish	Nitroimidazole- Metronidazole	1.31 µg/kg to 50 µg/kg, LOD: 1.31 µg/kg
4.	Crustacean and Fish	Nitroimidazole- Metronidazole Hydroxy	1.66 µg/kg to 50 µg/kg, LOD: 1.66 µg/kg
5.	Crustacean and Fish	Nitroimidazole-Dimetronidazole	1.24 µg/kg to 50 µg/kg, LOD: 1.24 µg/kg
6.	Crustacean and Fish	Nitroimidazole-Ipronidazole	1.36 µg/kg to 50 µg/kg, LOD: 1.36 µg/kg
7.	Crustacean and Fish	Nitroimidazole-Ronidazole	1.2 µg/kg to 50 µg/kg, LOD: 1.2 µg/kg
8.	Crustacean and Fish	Nitrofurantoin Metabolites-AMOZ	0.27 µg/Kg to 50 µg/Kg, LOD: 0.27 µg/kg
9.	Crustacean and Fish	Nitrofurantoin Metabolites-AHD	0.44 µg/Kg to 50 µg/Kg, LOD: 0.44 µg/kg
10.	Crustacean and Fish	Nitrofurantoin Metabolites-AOZ	0.30 µg/Kg to 50 µg/Kg, LOD: 0.3 µg/kg
11.	Crustacean and Fish	Nitrofurantoin Metabolites-SEM	0.42 µg/Kg to 50 µg/Kg, LOD: 0.42 µg/kg

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12.	Cephalopods, Fish, Crustacean	Chemical Elements-Arsenic	0.04 mg/kg to 5 mg/kg, LOD: 0.015 mg/kg
13.	Cephalopods, Fish, Crustacean	Chemical Elements-Cadmium	0.02 mg/kg to 5 mg/kg, LOD: 0.01 mg/kg
14.	Cephalopods, Fish, Crustacean	Chemical Elements-Cobalt	0.01mg/kg to 5 mg/kg, LOD:0.005 mg/kg
15.	Cephalopods, Fish, Crustacean	Chemical Elements-Indium	0.01mg/kg to 5 mg/kg, LOD:0.005 mg/kg
16.	Cephalopods, Fish, Crustacean	Chemical Elements-Lead	0.01mg/kg to 5 mg/kg, LOD: 0.005 mg/kg
17.	Cephalopods, Fish, Crustacean	Chemical Elements-Mercury	0.01mg/kg to 5 mg/kg, LOD:0.005 mg/kg





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Audits done by field offices to ensure implementation of covid 19 guidelines prescribed by MPEDA in processing plants



The officials of the Regional Divisions of MPEDA in Kolkata and Veraval inspected seafood processing plants to ensure adherence to COVID-19 guidelines.

MPEDA RD Kolkata officials had inspected M/s. Shankha Deep Exports Pvt. Ltd. and M/s. A.S. Enterprise during the month of April. It was found that the said units were fully aware of COVID 19 guidelines and properly implemented it in facility as well as in all operations, strict checking of body temperature of all employees and visitors, social distancing and sanitization, visual observation and reporting of

symptoms, and provision of quarters and canteen facilities to the workers to avoid social contacts were provided by the management of the processing plants. The officials from the Regional Office of Veraval inspected M/s. Gopal Seafoods and M/s. Mira Seafoods, M/s. Pesca Marine Products Pvt. Ltd., M/s. Sagar Foods, M/s. Indian Exports, M/s. Kalpataru Exports, M/s. Honest Frozen Foods Co. Unit-I, M/s. Kalpana Impex, M/s. Veraval Marine & Chemicals Pvt. Ltd., M/s. New Royal Frozen Foods, M/s. Win Marine Products in the month of April. All the enterprises were found to be strictly adhering to the COVID -19 guidelines provided by MPEDA.



Small-scale fisheries can support food security efforts in Arabian Sea countries

Countries surrounding the Arabian Sea should empower well-managed artisanal and subsistence fisheries to back food security efforts, a new Sea Around Us study suggests. In a chapter titled "The Fisheries of the Arabian Sea Large Marine Ecosystem," included in the book *The Arabian Seas: Biodiversity, Environmental Challenges and Conservation Measures* published by Springer Nature, Sea Around Us researchers describe the fisheries in the exclusive economic zones of Somalia, Djibouti, Yemen, Oman, the United Arab Emirates, Iran, Pakistan and India's Malabar coast, as well as in the region's high seas. They point out how industrial operations are responsible for 44% of total catches in the 65-year period covered in the study (1950-2014), with most catches being taken from India's, Pakistan's and Yemen's EEZs. Although the industrial sector's catches grew steadily and peaked in 1997, from the early 2000s onwards, catches started declining and have stabilized at around 2.3 Mt per year. The decline is attributed to excessive fishing aided by poor fisheries regulations and often lack of enforcement, which has meant that over the last 20+ years, an increasing number of stocks in the Arabian Sea LME have started to dwindle. "We analyzed 298 fish stocks, and of those, over 50 percent are in the fully exploited category with few—if any—with potential for fisheries growth," said Deng Palomares, lead author of the chapter, and the Sea Around Us project manager at the University of British Columbia.

"About 25 percent, on the other hand, are overexploited and the trend that we see is one of increasingly more overexploited, collapsed and fully exploited stocks, while stock rebuilding seems to be poor." Palomares said that over time, catches in this ecosystem have increasingly consisted of species lower in the food web, which means that larger fishes such as tuna are

being fished out and smaller organisms are becoming more prevalent. "This confirms the existence of 'fishing down the food web' in this area," Palomares said.

The small-scale sector also plays an important role in the Arabian Sea Large Marine Ecosystem, with combined catches of artisanal and subsistence fisheries reaching approximately 21.3 Mt in the 2010s. The analysis shows that, throughout the studied period, 56 percent of catches are taken by small-scale operators who either sell the fish on local markets and keep a small portion or keep the entire catch for their own and their families' consumption. "The high proportion of artisanal and subsistence fishers means that the majority of the fishing in this LME and thus the majority of catches occur within national EEZ waters," said Dirk Zeller, coauthor of the study and director of the Sea Around Us—Indian Ocean at the University of Western Australia. "This means that national governments can manage the exploitation of marine resources, allowing for potentially better control compared to most fishing in the high seas waters."

Even though some progressive actions have been taken already, such as the 2011 trawl ban in Oman and the ban on driftnets in the UAE in the late 1980s, in both countries, as elsewhere in the region, the lack of control based on a strong and well-defined legal framework means that most regulatory measures are ignored.

"Serious considerations ought to be given by all countries to policies that focus on reducing and tightly controlling industrial fishing, both domestic and foreign, and assisting well-managed small-scale fisheries for both national consumption and carefully controlled and monitored export fisheries," Zeller said. "This is the direction in which all fisheries around the world need to be heading, to ensure the survival of a blue economy."

-www.phy.org



Use of square mesh cod-ends to benefit fishers, finds study

The deployment of square mesh cod-ends in trawling operations considerably reduces by-catch and improves sustainability of fishing operations, say studies conducted under the Central Institute of Fisheries Technology (CIFT) in cooperation with the M.S. Swaminathan Research Foundation (MSSRF) in Mandapam, Tamil Nadu, and the All Kerala Fishing Boat Owners Association in Kollam. Scientists associated with the study said the implementation of the Kerala Marine Fishing Regulation Act, which prescribed the use of square mesh cod-ends in small and big trawlers, would go a long way in providing long-term benefits for fishers and help maintain a sustainable marine ecosystem.

Field trials to demonstrate the utility of square mesh cod-ends in place of diamond cod-ends in trawl nets were carried out at Shakthikulangara fishing harbour, Kollam, where two trawlers with the same dimension and engine power but with different cod-ends were

selected for demonstrations in February this year. No changes were made in the traditional fishing methods used by the fishers in the region.

Only the cod-end portion of the trawl net was changed for the studies. Chinnadurai S., scientist, and Nobi P.S. and Dhijudas P.H., technical officers from ICAR-CIFT, were present to manage the fishing operations and collect and quantify the catch.

Fishers were actively involved in the study to gain first-hand knowledge of the process and experience the difference in catch and price obtained. The study results showed that the size of the shrimps caught in square mesh cod-ends had increased by 10% and revenue from the fishing expedition increased by 23.7%. The fishers were satisfied with the catch with lesser quantity of debris and juveniles when compared to the traditional diamond mesh cod-ends.

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Fisheries body develops nano solutions to prevent biofouling in aquaculture nets



The Indian Council of Agricultural Research's arm Central Institute of Fisheries Technology (CIFT) has developed nanotechnology solutions to prevent the growth of unwanted organisms, also known as biofouling, in the polyethylene nets that are used for aquaculture in the seas. Biofouling, a recurring problem, is affecting the aquaculture sector significantly impacting fish production from aquaculture cages, leaving the sector concerned.

Adverse effects

Biofouling causes clogging of meshes and reduces the water circulation in cage nets, thus minimising the size of mesh opening. It leads to the blockage of food waste and anoxic conditions inside the cages, thereby reducing the survival rate and the health of fishes. It is also pointed out that biofouling of aquaculture nets also cause severe maintenance and operational problems and its management needs about 25 per cent of the total production cost.

Nano coating

CIFT's technology uses polyaniline and nano copper oxide. Aquaculture cages are fabricated primarily with high-density polyethylene (PE) webbings whose surface is to be coated with polyaniline and nano copper oxide and exposed in the open sea and estuarine environment. P Muhammed Ashraf, Principal Scientist

at CIFT, said field exposure studies were conducted at Vishakapatnam (open sea) for six months by exposing two treated webbings. The results showed a significant biofouling resistance.

The study concluded that the nano copper oxide present in the matrix acted as a point source above the electron clouds of polyaniline, preventing initialisation of biofilm. The results highlighted the potential application of polyaniline to modify the non-polar surface of polyethylene to load active biocides to prevent fouling in cage aquaculture. From the field exposure studies, the results revealed a great potential for polyaniline with nano copper oxide against biofouling in aquaculture cage nets. This technology has to be promoted further for commercialisation, he added. CN Ravishankar, Director, CIFT, said that India's fish demand would have risen to 18 million tonnes by 2030 and it requires an additional seven million tonnes in a decade. With the capture sector plateauing, most of this demand should be met by aquaculture, especially mariculture, which is expected to make a significant contribution in the fish supply in the country. Fouling control is one area where there are not many easy-to-use technologies. This CIFT technology would greatly minimize fouling, which will have a cascading impact on the profitability of mariculture operations, he said.

-www.thehindubusinessline.com



CIBA launches India's first homegrown fish vaccine



ICAR-CIBA has launched a recombinant vaccine against viral nervous necrosis (VNN), in a milestone for aquaculture vaccine development in India. On 27th April, Dr. JK Jena, deputy director general (fisheries) at ICAR, launched CIBA-Nodavac-R, in a bid to combat VNN, which affects many marine, brackishwater and freshwater fish, causing up to 100 percent mortality in larval and early juvenile stages.

The disease is caused by nervous necrosis virus (NNV). Red-spotted Grouper nervous necrosis virus (RGNNV) is the only genotype prevalent in India and most other tropical countries. The disease is transmitted both vertically and horizontally. Infected adults remain as carriers and transmit the virus to offspring through eggs. The practical way to control the disease and prevent vertical transmission is to vaccinate fingerlings and adult fish.

CIBA-Nodavac-R is an injectable recombinant VNN vaccine which can effectively prevent VNN caused by

RGNNV in fingerlings and prevent vertical transmission in brooders. ICAR say that it “is safe and efficacious” and it was developed under the consortium research platform on vaccines and diagnostics. The vaccine can be used in all species susceptible to VNN, including Milkfish, Grey Mullet and Mangrove Red Snapper. At the event Dr. Jena congratulated CIBA and the team for developing the vaccine.

Dr. KK Vijayan, director of ICAR-CIBA, explained the impact of VNN on brackishwater aquaculture and the importance of the vaccine in controlling the disease. He added that the vaccine will help to prevent VNN in fish hatcheries and bring down the incidence of VNN in grow-out farms. Dr. M Makesh, principal investigator of the project, explained the details of the vaccine development and its applications. According to ICAR-CIBA, an oral vaccine for delivery through feed and an immersion vaccine are also under development.

-www.thefishsite.com



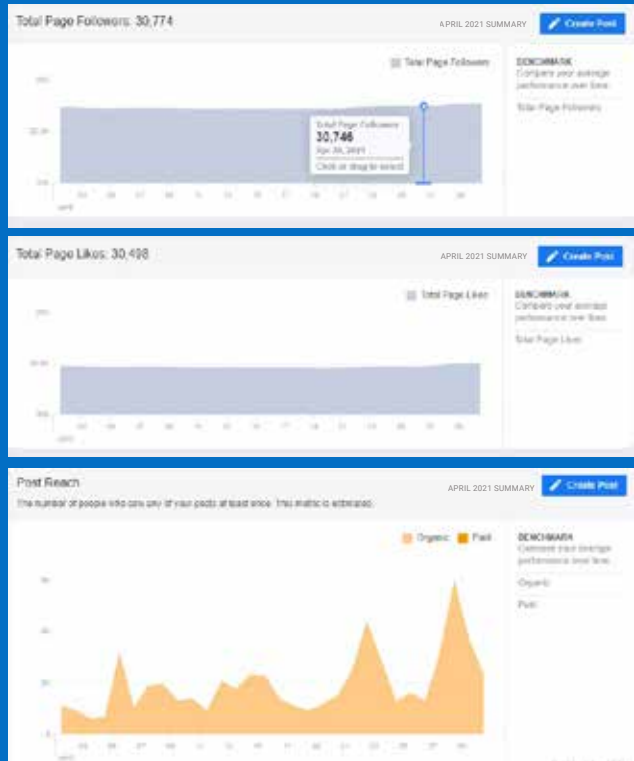
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