



सत्यमेव जयते

मत्स्य भारत

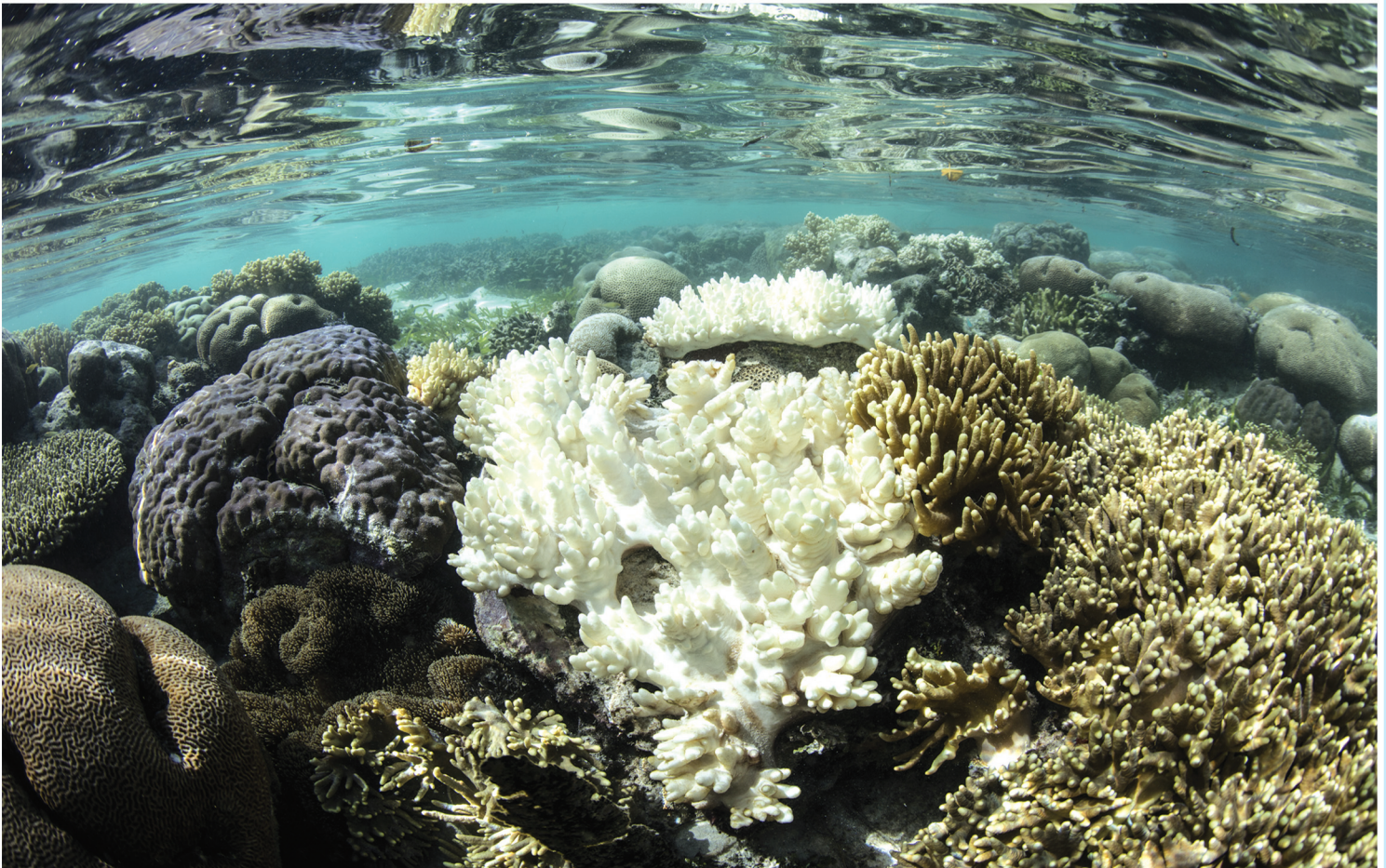
Matsya Bharat



Newsletter of the National Fisheries Development Board

Volume 9, Issue 1

April - June 2017



The United Nations Sustainable Development Goal 14 – Conserve and sustainably use the Oceans, Seas and Marine Resources: Mitigate Pollution, Climate Change and Acidification

(Photos courtesy: The Ocean Conference, United Nations, New York, 5-9 June 2017)

In this Issue

	Page No.
* Cover Story	5
1. North and Northeast	7
2. Farmers' Note Book	14
3. New/Innovative Technologies in Fisheries	18
4. NFDB Initiatives	20
5. Important Events	22
6. NFDB Field Notes	26
7. Fishers & Farmers News	27
8. Fisheries & Aquaculture Industry News	28
9. NFDB News	29
10. NFDB in the Media	30
11. Announcements	31

Chief Editor & Publisher:

Mrs. I. Rani Kumudini, IAS
Chief Executive
National Fisheries Development Board
Hyderabad – 500 052

Associate Editor:

Dr. K. Ravindranath, Sr. Consultant (Tech)

[Mail to: matsyabharat@gmail.com]

Days to Remember

Feb 02	World Wetlands Day
March 22	World Water Day
March 23	World Meteorology Day
April 05	National Maritime Day
April 16	World Entrepreneurship Day
April 22	International Mother Earth Day
May 02	World Tuna Day
May 22	International Day for Biological Diversity
May 23	World Turtle Day
May 24	World Fish Migration Day
June 05	World Environment Day
June 08	World Oceans Day
July First Saturday	International Day of Cooperatives
July 10	National Fish Farmers' Day
	NFDB Formation Day
July 11	World Population Day
Sept 16	International Day for Preservation of Ozone Layer
Sept 18	World Water Monitoring Day
Sept 26	World Hunting & Fishing Day
Oct First Monday	World Habitat Day
Oct 16	World Food Day
Nov 21	World Fisheries Day
Dec 03	World Conservation Day
Dec 05	World Soil Day
Dec 14	World Energy Day
Seasonal Fishing Ban/ Closed Season (60 days)	
East Coast of India	15 April to 14 June
West Coast of India	01 June to 31 July



CONTENTS

Sl. No.	Item	Page No.
*	Cover Story: <i>'The Ocean Conference'</i> – Countries agree on decisive and urgent actions to restore Marine World to health	5
1.1	Projects Implementation in North Eastern States – First Zonal Review Meeting held at Guwahati, Assam	7
1.2	Stakeholders consultation for 'National Inland Fisheries and Aquaculture Policy' held at Guwahati, Assam	7
1.3	Upcoming Integrated Ornamental Fish Unit at Patarkuchi, Kamrup district, Assam, inspected	8
1.4	NFDB funded Hygienic Fish Markets in different districts of Assam inspected for progress of work	8
1.5	Project Monitoring Committee Reviews NFDB funded 'Community Fish Seed Bank Project' in Bongaigaon, Assam	10
1.6	NFDB funded training programme on 'Aquatic Animal Health Management in Aquaculture' conducted at College of Fisheries, Raha, Assam	11
1.7	All India Radio Guwahati, Assam facilitates popularizing 'Central Sector Schemes under Blue Revolution' in the North East States	12
1.8	NFDB funded Ornamental Fish Units in Assam inspected	12
1.9	NFDB sponsored programmes under ' <i>Swachhta Pakhwada - 2017</i> ' conducted at various locations in the State of Assam	12
2.1	<i>Giant River-catfish</i> – native to the Indian Subcontinent and in great demand as food fish	14
3.1	<i>'Square Mesh Panels'</i> on Trawl Nets Reduce By-catch and Conserve Marine Demersal Fishery Resources	18
4.1	First meeting of the Technical Management and Advisory Committee on NFDB-NFFBB held at Krishi Bhavan, New Delhi	20
4.2	National Consultation Meet on 'Mariculture and Open Sea Cage Culture Development in India' held at CMFRI, Mandapam, Tamil Nadu	21
5.1	The United Nations Celebrates first ever ' <i>World Tuna Day</i> ' on 2 May 2017	22
5.2	<i>'World Environment Day'</i> observed on 5 June 2017	22
5.3	<i>'Kisan Kalyan Mela'</i> organized on the occasion of ' <i>Champaran Satyagraha</i> ' centenary at Motihari, Bihar	24



Sl. No.	Item	Page No.
5.4	International Symposium and School on Aquatic Animal Epidemiology organized under NFDB funded NSPAAD Project at NBFGR, Lucknow, Uttar Pradesh	24
5.5	NFDB Participates in 'Aqua Aquaria India 2017' at Mangalore, Karnataka	25
6.1	Activities at National Freshwater Fish Brood Bank (NFDB-NFFBB), Bhubaneswar, Odisha	26
7.1	Fishermen of Saurashtra Region, Gujarat, undergo training in adoption of 'Square Mesh Codend for Trawl Nets'	27
8.1	Progressive farmer of Haryana adopts Recirculation Aquaculture System to boost fish production – A Success Story	28
9.1	Mrs. I. Rani Kumudini, IAS, takes over as Chief Executive of NFDB	29
9.2	NFDB Staff – Repatriation, Additional Charge and Transfers	29
9.3	Karnataka Farmers on an Exposure Visit to Andhra Pradesh visit NFDB	30
9.4	'International Yoga Day' observed at NFDB, Hyderabad	30
10.0	NFDB in the Media	30
11.0	Announcements (11.1 to 11.5): International Conferences/Meets/Symposia	31

Cover Story

'The Ocean Conference' – Countries agree on decisive and urgent actions to restore Marine World to health

Excerpts

The Ocean Conference, first of its kind, convened by the United Nations and co-hosted by Fiji and Sweden, was held during 5-9 June 2017 at New York, USA, coinciding with *World Oceans Day* on 8th June 2017. The United Nations Secretary-General Mr. António Guterres told the opening session of the Ocean Conference that the problems of the ocean—all created by human activity, can all be reversed and prevented with decisive, coordinated action. "Oceans are a testing ground for the principle of multilateralism," he said. "The health of our oceans and seas requires us to put aside short-term national gain, to avoid long-term global catastrophe." "Conserving our oceans and using them sustainably is preserving life itself," he added.

The Ocean Conference focused attention on ocean pollution, overfishing and climate impacts with a **Call for Action to implement Sustainable Development Goal 14** (SDG-14): to conserve and sustainably use the world's oceans, seas and marine resources. The SDG-14 is one of the 17 Goals of the 2030 Agenda for Sustainable Development, an ambitious framework to Transform Our World.



Inaugural Session of the Ocean Conference on 5 June 2017 at the United Nations Headquarters, New York, USA [Courtesy of the UN, Source: <https://oceanconference.un.org/>]

The President of the UN General Assembly Mr. Peter Thomson said that "The Ocean Conference has changed our relationship with the ocean". "Henceforth none can say they were not aware of the harm humanity has done to the ocean's health. We are now working around the world to restore a relationship of balance and respect towards the ocean," he said.



Mr. Peter Thomson, President of Gen Assembly of UN, addressing delegates at the Ocean Conference, UN, New York, USA [Courtesy of the UN, Source: <https://oceanconference.un.org/>]

Mr. Wu Hongbo, Under-Secretary-General for Economic and Social Affairs and Secretary-General of the Ocean Conference, said the Conference marked a major step forward for the implementation of the Sustainable Development Goals. "Participants from member States, NGOs, civil society, the private sector, the scientific community and academia engaged in wide-ranging discussion and shared state-of-the-art knowledge and latest information on marine science and challenges," he said. "They showcased and put forward many innovative solutions, which can help us achieve Sustainable Development Goal 14, and through its interlinkages the other SDGs and targets."

At the conclusion of the five-day Ocean Conference on 9th June, the 193 Member States of the United Nations unanimously agreed to a set of measures that will begin the reversal of the decline of the ocean's health. The outcome document, together with more than 1,300 commitments to action, marks a breakthrough in the global approach to the management and conservation of the ocean.



Left: Logo of the United Nations Ocean Conference held during 5-9 June 2017 at New York, USA. Right: Logo of the 17 Sustainable Development Goals (SDGs) framed by the United Nations. [Courtesy of the UN, Source: <https://oceanconference.un.org/>]

Conference Outcomes

Recognizing that the wellbeing of present and future generations is inextricably linked to the health and productivity of the ocean, countries collectively agreed in the Call to Action “to act decisively and urgently, convinced that our collective action will make a meaningful difference to our people, to our planet and to our prosperity.”

While the ocean partnership dialogues focused on the multiple problems and challenges the ocean is facing, all participants offered solutions and commitments to reverse these challenges.

The **Call for Action** was formally adopted at the conclusion of the Conference, as well as the reports from the seven partnership dialogues that have focused on scaling up solutions, and the voluntary commitments to action.

In the Call for Action, countries agree to implement long-term and robust strategies to reduce the use of plastics and microplastics, such as plastic bags and single use plastics.



FAO Headquarters (hosts the Fisheries & Aquaculture Department) in Rome, Italy, lights up blue to mark the World Oceans Day on 8 June 2017 with the theme “Our Oceans, Our Future” [Courtesy of the UN, Source: <http://www.fao.org/blogs/blue-growth-blog/lighting-fao-blue-to-mark-world-oceans-day/en/>]

Countries also agreed to develop and implement effective adaptation and mitigation measures that address ocean and coastal acidification, sea-level rise and increase in ocean temperatures, and to target the other harmful impacts of climate change on the ocean. The Call recognizes the importance of the Paris Agreement on Climate Change.

The Call for Action also includes measures to protect coastal and blue carbon ecosystems, such as mangroves, tidal marshes, seagrass and coral reefs, and wider interconnected ecosystems, as well as enhancing sustainable fisheries management, including restoring fish stocks in the shortest time feasible at least to levels that can produce maximum sustainable yield (MSY). Countries are called upon to decisively prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, and eliminate subsidies that contribute to illegal, unreported and unregulated fishing.



Dais during Plenary Session at the Ocean Conference, UN, New York, USA [Courtesy of the UN, Source: <https://oceanconference.un.org/>]

The commitments, in turn, address all the issues needed to achieve Sustainable Development Goal 14 — Conserve and sustainably use the oceans, seas and marine resources — and produced significant results:

- Commitments made at the Conference indicate that the world is well on track to protect over 10 per cent of the globe's marine areas by 2020. The commitments made during the conference add 4.4 per cent of marine areas to the existing number.
- Many countries announced steps to reduce or eliminate various single use plastics, such as plastic shopping bags, which ultimately find their way to the ocean.
- Numerous countries announced that they were stepping up their efforts to reduce the amount of sewage and pollution entering the ocean from land-based activities.
- Many commitments focused on expanding scientific knowledge about the ocean and developing and sharing innovative technologies to address ocean challenges.

- There were new commitments to protect and manage fisheries. Some countries announced “no-take zones” for certain fishing.
- Commitments were made to establish systems that allow consumers to source sustainable fish.
- New commitments were also made to combat illegal, unreported and unregulated fishing, and to curtail fishing subsidies that are working to deplete fish stocks.

[Source: The United Nations Ocean Conference; <https://oceanconference.un.org/>]

[**Photos on Cover Page:** Red Lion-Fish *Pterois volitans* (above left); Bubble-tip Sea Anemone *Entacmaea quadricolor*, with the symbiotic Pink Anemone Fish also known as Pink Skunk Clownfish *Amphiprion perideraion* (above right); and Coral (*Pocillopora sp.*) Bleaching caused by Ocean Warming (below)]

1. North and Northeast

1.1 Projects Implementation in North Eastern States – First Zonal Review Meeting held at Guwahati, Assam

The Zonal Review Meeting on ‘Implementation of Projects under Blue Revolution in North Eastern States’ was held on 15 June 2017 at the Northeast Regional Centre of NFDB, in the campus of NIRD&PR, Guwahati, Assam, under the Chairmanship of Shri Aditya Kumar Joshi, Joint Secretary (Fisheries), Dept. of Animal Husbandry, Dairying & Fisheries (DADF), Ministry of Agriculture & Farmers Welfare, Govt. of India, & Chief Executive, NFDB, Hyderabad



First Zonal Meeting to review implementation of fisheries projects in North Eastern States held on 15 June 2017 at NFDB-NERC, Guwahati, Assam

Thirty five officials including Directors and representative from Directorates of Fisheries of North Eastern States participated in the review meeting and discussed about the status of Schemes under Blue Revolution in North Eastern States. Dr. B.K. Chand, Executive Director (Tech), Shri Chandan Chetri, Sr. Executive (Technical), NFDB, Hyderabad, and Shri S.K. Rath, Assistant Commissioner (Fisheries), DADF, GoI, also took part. Directors and other officials were asked to expedite the utilization of funds released under Blue Revolution for the year 2016-17. They were also informed that proposals for the year 2017-18 under Blue Revolution Scheme along with Detailed Project Report (DPR) are to be sent at the earliest to NFDB, Hyderabad, to furnish immediately the pending UC's of NFDB funded schemes for further release of fund under ‘Blue Revolution’.

1.2 Stakeholders consultation for ‘National Inland Fisheries and Aquaculture Policy’ held at Guwahati, Assam

A Stakeholders Consultation for formulation of draft ‘National Inland Fisheries and Aquaculture Policy’ (NIFAP), was held on 16 June 2017 at the Northeast Regional Centre of NFDB, in the campus of NIRD&PR, Guwahati, Assam. More than 75 stakeholders and experts participated in the consultation workshop.

The inaugural session was chaired by Shri Aditya Kumar Joshi, JS (Fy) DADF & Chief Executive, NFDB, Hyderabad. Dr. Dilip Kumar, Ex-Director & Former Vice-Chancellor, ICAR-CIFE, Mumbai, the Chairman of the committee for formulation of the Policy; Shri Manash Choudhury, Deputy Advisor (Fisheries), NITI Aayog, Govt. of India; Dr. Gopal Krishna, Director & Vice Chancellor, ICAR-CIFE, Mumbai; Dr. B.K. Das, Director, CIFRI, Kolkata; Dr. B.C. Jha, Retd. Principal Scientist, CIFRI, Dr. B.K. Battacharjya, Principal Scientist & Head, CIFRI, NERC, Guwahati; besides other scientists from ICAR Institutes: CIFE, CIFRI, CIFA; officials from Department of Fisheries of the North Eastern States; NFDB, Hyderabad, Shri S.K. Rath, Assistant Commissioner (Fisheries), DAHDF, GoI, Dr. B.K. Chand, Executive Director (Tech), Shri Chandan Chetri and Shri Apurba Kumar Das, Sr. Executives (Tech), NFDB; stakeholders such as farmers from different parts of Assam, fishers of wetlands, representatives of different NGO's working in Assam also participated in the workshop.



Stakeholders Consultation on NIFAP, held on 16 June 2017 at Guwahati, Assam: release of document 'Roadmap for Fisheries' (above); discussions by the 'Pengba' group (below left) and the 'Pabda' group (below right)

During the technical sessions, two groups – one, the “Pengba” (Catfish *Osteobrama belangeri*), focusing on culture fisheries and the other, the “Pabda” (Catfish *Ompok pabda*), focusing on capture fisheries and open water bodies – were formed among the participants. Suggestions/recommendations made were discussed and deliberated.

Dr. Dilip Kumar, Chairman of the Drafting Committee, informed that the final meeting of ‘National Inland Fisheries and Aquaculture Policy’ would be held in Mumbai and that the points put forth during the Guwahati Workshop would be incorporated.

1.3 Upcoming Integrated Ornamental Fish Unit at Patarkuchi, Kamrup district, Assam, inspected

NFDB sanctioned an amount of Rs. 6.81 lakh and released Rs.3.40 lakh for the establishment of an Integrated Ornamental Fish Unit at Patarkuchi, Sonapur, Kamrup district, Assam. On 7 April 2017 Dr. B. Lahon, Sr. Consultant (Fisheries) and Shri Sangipran Baishya, Jr. Consultant (Fisheries), NFDB Regional Centre, Guwahati, visited the project site located about 30 km from Guwahati. Shri Prasanta Bharali, the beneficiary and owner of Rudraksha Health Resort & Spa, in the premises of which the unit is being established, accompanied. It was observed that about 50-60% of the construction work is completed and the remaining works are under progress.



NFDB funded Integrated Ornamental Fish Unit under construction at Patarkuchi, Sonapur, Kamrup district, Assam; the beneficiary Shri Prasanta Bharali (middle) flanked by NFDB Officials (above)

1.4 NFDB funded Hygienic Fish Markets in different districts of Assam inspected for progress of work

NFDB sanctioned Rs. 952.93 lakh and released Rs 707.57 lakh for construction of seven Modern Hygienic Wholesale-cum-Retail Fish Markets in different districts of Assam.

From 24 April to 02 May 2017, Shri Apurba Kumar Das, Sr. Executive (Tech) & Officer-in-Charge, Dr. Bhupen Lahon, Sr. Consultant (Fisheries) and Shri Sangipran Baishya, Jr. Consultant, NFDB Regional Centre, Guwahati, accompanied by the Engineer and District Fishery Officer of Dept. of Fisheries, Assam, inspected the fish markets to observe the progress of work.

(i) Hygienic Wholesale-cum-Retail Fish Market at Howly, Barpeta district:

The Howly Fish Market has provision for 23 wholesale and 29 retail stalls. Construction of the building is completed up to lintel beam level. Release of State's share of funds will ensure early completion of the works; Fisheries Dept. officials were asked to expedite the release of funds.



Construction of Fish Market building underway at Howly, Barpeta district, Assam

(ii) Hygienic Wholesale-cum-Retail Fish Market at Adabari, Nalbari district:

The Adabari Fish Market has provision for 23 wholesale and 13 retail fish stalls. Construction works have been completed; installation of transformer is pending and electrification would be completed within a month, and then the market complex will become operational. As the fish market is not functioning, the market premises are being utilized for daily vegetable market purpose.



Fish Market building at Adabari, Nalbari district, Assam, to be electrified and commissioned

(iii) Hygienic Wholesale-cum-Retail Fish Market in Goalpara town, Goalpara district:

The Goalpara Fish Market has a provision for 24 wholesale/retail fish stalls; construction work is in the initial stage and the lintel beams are to be laid.



Fish Market building under construction on the bank of Brahmaputra River in Goalpara town, Goalpara district, Assam

(iv) Hygienic Wholesale-cum-Retail Fish Market at Gauripur, Dhubri district:

The Gauripur Fish Market at Dhubri has provision for 4 wholesale and 10 retail stalls; centering work for laying the slab is in progress.



Fish Market building under construction at Gauripur, Dhubri district, Assam

(v) Hygienic Wholesale-cum-Retail Fish Market at Mangaldoi, Darrang district:

The Mangaldoi Fish Market has provision for 84 wholesale/retail stalls; the market building is almost ready for commissioning. The visiting team interacted with existing fish traders at the Mangaldoi Fish Market.



Fish Market building constructed at Mangaldoi, Darrang district, Assam

(vi) Hygienic Wholesale-cum-Retail Fish Market at Tezpur, Sonitpur district:

The Tezpur Fish Market has provision for 70 wholesale/retail stalls. The construction is nearing completion.



Fish Market building constructed at Tezpur, Sonitpur district, Assam: external view (above) and stalls inside (below)

(vii) Hygienic Wholesale-cum-Retail Fish Market in Hailakandi town, Hailakandi district:

The Hailakandi Fish Market has provision for 13 wholesale and 32 retail stalls; the construction is nearing completion.



Fish Market in Hailakandi town, Assam: wholesale stalls (left) and retail stalls (right)

1.5 Project Monitoring Committee Reviews NFDB funded 'Community Fish Seed Bank Project' in Bongaigaon, Assam

NFDB sanctioned and released an amount of Rs. 13.08 lakh to CSS-ATMA, Bongaigaon for implementing the project 'Community Fish Seed Bank and Seed Rearing in Srijangram Development Block, Bongaigaon, Assam for Leveraging Livelihood of Small-scale Aquaculturist'. A Project Monitoring Committee (PMC) review meeting was held on 9 May 2017 at District Agriculture Office (DAO), Bongaigaon, Assam. The Seven-member PMC comprises



Project Monitoring Committee Review Meeting (above) and Bolbom SHG Members harvest advanced fingerlings of Jayanti Rohu and Amur Carp from Community Fish Seed Bank (below) in Srijangram Development Block, Bongaigaon, Assam

of Mr. B. Pegu, Deputy Commissioner, Bongaigaon (Chairman); Mr. M. Pegu, DAO-cum-PD, CSS-ATMA, Bongaigaon (Member Secretary); Shri K. Talukdar, Deputy PD, CSS-ATMA (Member); Dr. A Sarma, DFDO, BTT Member, CSS-ATMA (Convener); Shri Apurba Kumar Das, Officer-In-Charge & SE (Tech), NFDB, NERC (Member); Shri Harish Ch Roy, Progoti SHG (Membr); and Representative from KVK (Member).

The following observations were made by the PMC about the NFDB funded community based project:

- (i) 250 fish farmers were trained through 9 training programmes on different aspects of fish farming.
- (ii) Exposure Visits were conducted for 10 Progressive Farmers.
- (iii) Fry of *Jayanti rohu* and *Amur carp* was procured and supplied to the respective Farmers Interest Groups (FIGs).
- (iv) Demonstrations were carried out in 20 ponds, one in each Common Interest Group (CIG)/ Women Farmers Interest Group (WIG) selected out of the total 25 FIGs.
- (v) Duration of rearing was 90 days. During the culture period, the growth of both the species were encouraging.
- (vi) Multiplier effect and replication has been noticed in nearby villages, and 6 CIGs have procured seed from Community Seed Bank.
- (vii) Enthusiasm of seed growers has been noticed and they want to replicate in a bigger and better way.
- (viii) There is great demand of *Jayanti rohu* and *Amur carp* fingerling; they fetch Rs. 7.00 to Rs.8.00 per piece.
- (ix) It is decided to go for short tender notice for procurement of fish seeds of *Jayanti rohu* and *Amur carp* for the second intervention.

1.6 NFDB funded training programme on 'Aquatic Animal Health Management in Aquaculture' conducted at College of Fisheries, Raha, Assam

Under the NFDB funded major project 'National Surveillance Programme on Aquatic Animal Diseases' (NSPAAD), one-day training programme on 'Aquatic Animal Health Management in Aquaculture' was

conducted on 10 April 2017 at College of Fisheries, Assam Agricultural University, Raha, Assam. 50 farmers from Nagaon and Morigaon districts of Assam participated in the training programme. A Training Manual on 'Fish Disease in Aquaculture- Clinical Signs and Control Measures' was published and distributed among the trainees.



Training programme on 'Aquatic Animal Health Management in Aquaculture' conducted at College of Fisheries, Raha, Assam: Training Class (above) Participants (middle) and Training Manual (below)

1.7 All India Radio Guwahati, Assam facilitates popularizing 'Central Sector Schemes under Blue Revolution' in the North East States

With a view to popularise Central Sector Schemes (Fisheries) under Blue Revolution (*Neel Kranti Mission, 2016*) among the stakeholders/ beneficiaries in the North East States, the All India Radio (AIR), Guwahati, Assam, with financial assistance from NFDB, broadcast a series of Spots during January-February 2017. Two Live Phone-in-Programmes were also arranged by the AIR, Guwahati – one each during February and March 2017. In this series, again on 8 May 2017 the third Live Phone-in-Programme, anchored by Shri Aseem Kumar Kazi, Programme Executive, AIR Guwahati, was organized in which Mr. Apurba Kumar Das, Sr. Executive (Tech), Dr. Bhupen Lahon, Sr. Consultant (Fisheries) and Mr. Sangipran Baishya, Jr. Consultant (Fisheries), NFDB Regional Centre, Guwahati, took the calls from farmers in different parts of the State and answered queries about the different schemes.



NFDB Officials participating in the Live Phone-in-Programme at All India Radio (AIR), Guwahati, Assam

1.8 NFDB funded Ornamental Fish Units in Assam inspected

Dr. B.K. Chand, Executive Director (Tech), NFDB, Hyderabad, on 17 June 2017 visited the NFDB funded Integrated Ornamental Fish Unit established under the Aquaculture & Biodiversity Centre of the Dept. of Zoology, Gauhati University, Guwahati, Assam, to observe the ongoing activities. Later in the day he also inspected the site at Amranga, Kamrup district, Assam, for the proposed Small-scale Ornamental Fish Units to be established by the Dept. of Fisheries, Govt. of Assam, with NFDB

financial assistance. Mr. Sangipran Baishya, Jr. Consultant (Fisheries), NFDB Regional Centre, Guwahati, accompanied



The Executive Director, NFDB, inspecting the Ornamental Fish Unit at Gauhati University (above left) and that of Dept. of Fisheries, Govt. of Assam, at Amranga (above right) and interacting with beneficiaries from Amranga, Assam (below)

1.9 NFDB sponsored programmes under 'Swachhta Pakhwada - 2017' conducted at various locations in the State of Assam

Under the 'Swach Bharat Mission' a nation-wide cleanliness campaign was launched by Govt. of India. As part of the 'Swachhta Pakhwada-2017', NFDB sponsored Awareness Camps and State Level Workshops, with special emphasis on hygienic handling of fish and maintaining hygienic conditions in fish markets. The following activities were undertaken in the State of Assam:

(i) NFDB-NERC, Guwahati, Organizes Awareness Camp at Betkuchi Fish Market, Guwahati, Assam:

Staff of NFDB Regional Centre, Guwahati led by Mr. Apurba Kumar Das, Sr. Executive (Tech) & Officer-in-Charge, participated in the cleanliness drive on 17 May, 2017. Awareness on importance of cleanliness, hygienic handling of fish and hygienic management of fish market was created among the fish vendors and traders, etc. Waste disposal containers, brooms, disposable polybags etc were used in the cleaning activity and later handed over to the Cooperative Society for using in the fish market.



Staff of NFDB Regional Centre, Guwahati along with members of Market Committee on a cleanliness drive at Betkuchi Fish Market, Guwahati, Assam

(ii) Dept. of Fisheries conducts Awareness Programme and Cleanliness Drive at Sulung Fish Market and at Tinsukia Fish Market, Assam:

NFDB sanctioned and released Rs. 2.00 lakh to the Dept. of Fisheries, Govt. of Assam to organize awareness programme and cleanliness drive at fish markets in Assam. The daylong programme at Sulung Hygienic Wholesale-cum-Retail Fish Market, Nagaon district, was organized on 22 May 2017.



Cleanliness drive on the premises of Sullung Wholesale-cum-Retail Fish Market, Nagaon district, Assam

At Tinsukia Fish Market, Tinsukia district, the Swachhata Pakhwada programme was inaugurated by Shri Parimal Suklabaidya, Hon'ble Fisheries Minister, Govt. of Assam, on 25 May 2017, in which local MLA, Shri Sanjay Kishan, Chairman of Tinsukia Municipality participated.

Officials from the Dept. of Fisheries of Nagaon, Tinsukia and Dibrugarh districts, Officers of NFDB-NERC, Members of the Fish Market Committee, fish traders and vendors participated. A booklet - 'Hygienic Handling of

Fishes' (in Assamese) was also released and distributed among the participants on the occasion. Waste disposal containers, garbage polybags, etc., were distributed on both the occasions.



Shri P Suklabaidya, Hon'ble Minister for Fisheries, Govt. of Assam, leading the Cleaning Rally at Tinsukia Fish Market, Tinsukia district, Assam

(iii) Workshop on 'Recycling of Waste through Integrated Fish Farming' organized by NFDB-NERC at Guwahati, Assam:

NFDB Regional Centre, Guwahati organized a daylong Workshop on 'Recycling of Wastes through Integrated Fish Farming' on 27 May 2017 at the Dr. A. P. J. Abdul Kalam Conference Hall of NIRD&PR, NERC, Guwahati, Assam. More than 100 participants from different parts of the State participated in the Workshop. The main objective of the Workshop is to create awareness on need for cleanliness in all walks of life in general and recycling of wastes through integrated fish farming in particular.



State-level Workshop on 'Recycling of Waste through Integrated Fish Farming' organized under Swachhata Pakhwada-2017 by NFDB Northeast Regional Centre at Guwahati, Assam: Inaugural Session (above) and Interactive Session (below)

Dignitaries at the inaugural session of the workshop include Dr. A.K. Chakravarty, Director of Research (Veterinary & Fisheries), Assam Agricultural University (AAU), Dr. K. Haloi, Professor and Head, C-GARD, NIRD&PR, NERC, Guwahati, Shri Gagan Sarma, Deputy Director (Fisheries), Govt. of Assam. Resource persons at the technical session include Dr. A.K. Chakravarty, Director of Research (Veterinary & Fisheries), AAU; Dr. K.K. Tamuli, Professor & Dean (i/c), College of Fisheries, AAU, Raha, Nagaon, Assam; Dr. S.K. Das, Principal Scientist and Head (Fisheries), ICAR Research Complex for NEH Region, Barapani, Meghalaya; Dr. B.K. Bhattacharjya, Principal Scientist and Head, ICAR-CIFRI Regional Centre, Guwahati. An interactive session between farmers and scientists was also organized for creating a better and healthy environment by recycling wastes through fish farming, in which Dr. (Mrs) Sona Yengkokpam, Scientist and Mrs. Niti Sharma, Scientist, ICAR-CIFRI, NERC, Guwahati and officials of NFDB Regional Centre, Guwahati, also participated.

(iv) NFDB sponsored State Level Workshop on 'Hygienic Handling of Fishes' organized by Dept. of Fisheries, Govt. of Assam:

The Dept. of Fisheries, Govt. of Assam, organized NFDB sponsored State Level one-day Workshop on 'Hygienic

Handling of Fishes' on 31 May 2017 in the Conference Hall of ICAR-CIFRI, Regional Centre, Guwahati. Shri S. K. Das, Director of Fisheries, Govt. of Assam was Chief Guest. Faculty from Gauhati University, Scientists from ICAR-CIFRI, NERC, Guwahati, Fishery Officials & Extension Officers from Dept. of Fisheries, Officers from FISHFED, representatives from FISHCOFED, fish producers, retailers, functionaries of premier fish market committees, and Officers of NFDB Regional Centre, Guwahati, participated.



NFDB sponsored workshop on 'Hygienic Handling of Fishes' organized under Swachhata Pakhwada-2017 by Dept. of Fisheries, Govt. of Assam, at Guwahati, Assam

2. Farmers' Note Book

2.1 Giant River-catfish – native to the Indian Subcontinent and in great demand as food fish*

In this Chapter, in the previous eight Issues, under the theme 'Lesser Known Freshwater Fish with Good Economic Potential', general information on the: Striped Murrel *Channa striata* (Bloch, 1793), Spiny Eel *Mastacembelus armatus* (Lacepède, 1800), Climbing Perch *Anabas testudineus* (Bloch, 1792), Mola Carplet *Amblypharyngodon mola* (Hamilton, 1822), Desi Magur/Walking Catfish *Clarias batrachus* (Linnaeus, 1758), Asian Seabass *Lates calcarifer* (Bloch, 1790), Giant Gourami *Osphronemus goramy* Lacepède, 1801, and on Tilapias, especially the Nile Tilapia *Oreochromis niloticus* (Linnaeus, 1758), was provided.

In the present issue general information and less known facts about the **Giant River-catfish, *Sperata seenghala*** (Sykes, 1839) [= *Mystus seenghala*/ *Aorichthys seenghala*], one of the most intensively fished and much sought after fishes in the Indian Subcontinent, is presented.

Catfishes are those with barbels (whiskers) on the snout and without scales on the body (naked). Catfishes belong to the Order Siluriformes. Sea catfishes belong to Family

Ariidae (Genus: *Tachysurus*); Freshwater catfishes belong to Families: Siluridae (Genus: *Ompok*, *Wallago*), Bagridae (Genus: *Mystus*, *Sperata*), Sisoridae (Genus: *Glyptothorax*), Pangasiidae (*Pangasius*), Clariidae (*Clarias*), Heteropneustidae (*Heteropneustes*), etc.

*Compiled by: Dr. K. Ravindranath, Senior Consultant (Technical), National Fisheries Development Board, Hyderabad – 500 052. [Email: krnath.nfdb@rediffmail.com]

Sperata seenghala (Sykes, 1839)

Common Name – Giant River-catfish

Vernacular Names

[Some of them are common to the similar- looking Long-whiskered Catfish *Sperata aor* (Hamilton, 1822)]

Assamese:	Aor, Aarii, Auri
Bengali:	Air, Aoveer, Arr-tengara, Guji, Guizza
Hindi:	Ari, Aarii, Gangari, Katerna, Pogal, Seenghala, Singara, Singhara, Tegari, Tengara
Kannada:	Adthu, Bili-Suragi, Halathimeenu, Shede
Malayalam:	Karadu, Karatta
Marathi:	Choot-kah, Shingala, Shingali
Oriya:	Addi, Alli, Katrang
Punjabi	Choot, Shingaree, Singoa, Tengara
Tamil:	Cumboo-kelethee, Cumboo-kelutti, Karumathalai-keluthi, Naddu-keluthi, Nedunthalai-kelutti, Pona-keluthi

Telugu:

Mukul-jella, Multi-jella, Naar-jella, Keeru-jella, Seengala, Serebella

Description

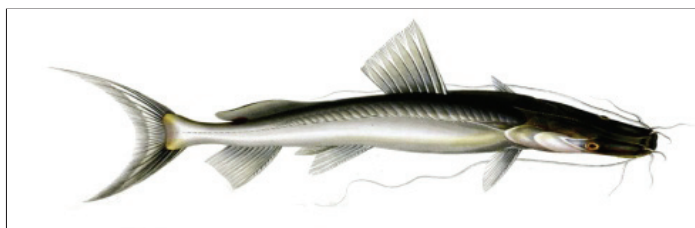
Body of *Sperata seenghala* is elongate and laterally compressed; head dorso-ventrally depressed; snout spatulate and bears four pairs of barbels: one pair of short nasal barbels, one pair of long maxillary barbels extending up to the pelvic fins, and two pairs of short mandibular barbels. Mouth sub-terminal, jaws and buccal cavity bear fine teeth. Lateral line continuous up to the caudal peduncle; Dorsal fin with 1 spine and 7 soft rays; Adipose dorsal fin with a prominent black spot posteriorly; Pectoral fins with a prominent serrated spine; Caudal fin deeply forked and upper lobe longer. Body brownish-grey on the back and silvery along belly.

Habit & Habitat

Inhabits rivers, reservoirs, canals, and associated lakes, beels, etc; migrates within rivers and streams and between lakes and rivers; thrives in freshwaters but may enter brackishwater habitats.

Food & Feeding

Carnivorous and predatory; during early stages feeds on water fleas, insects; later on tadpoles, fish fry, fish fingerlings, shrimps and molluscs. Readily feeds on live or frozen animal feed as well as formulated feed (pellets).



Drawing of Sperata seenghala (Sykes, 1839) [*Platystoma seenghala* Sykes, Transactions of the Zoological Society of London. Volume 2, 1839, Credit: J. Swaine (artist) Public Domain; Source: <https://en.wikipedia.org>]

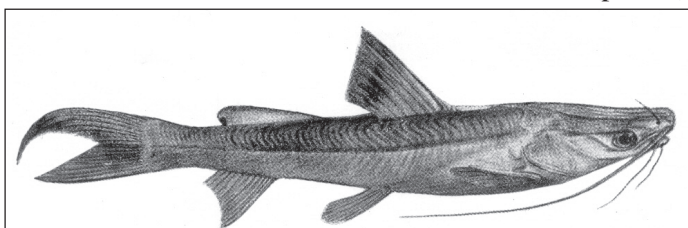


Image of Sperata seenghala (Sykes, 1839) [Source: *The Wealth of India Vol. IV, Fish and Fisheries*, CSIR, New Delhi, 1962]



Photograph of Sperata seenghala (Sykes, 1839), approx 30 cm long [Credit: Staticd, own work; Source: <https://en.wikipedia.org>]

Size & Weight

Maximum size recorded 224 cm; maximum weight recorded 11.0 kg (about 117 cm length); 100-150 cm length quite common, usually 40-60 cm.

Reproduction & Breeding

Males are slender, bear elongate genital papilla in front of Anal fin. Adults are observed throughout the year. Fishes ranging from 40-50 cm were observed to be mature. However, in the Ganges River *Sperata seenghala* measuring below 77 cm were immature and those above 99 cm were all mature. Spawning was observed between March and August with a peak during April-May, before the commencement of monsoon rains. The rise in temperature (22-31°C) is presumed to stimulate spawning. In Tungabhadra River above Sunkesula Anicut it is reported to breed between September and December.

Fecundity (number of mature eggs in the ovary) among smaller individuals ranged between 200-1,000, while 20,000 to 46,000 as well as 1,31,820 to 4,28,376 were also documented. Some studies reported that Seenghala is a single spawner while others reported multiple spawning. Pairing, nest-making and parental care is observed.

Parental Care

Sperata aor and *Sperata seenghala* [= *Mystus spp.*] exhibit unusual breeding habits and parental care, as documented by Dr. B. Sundara Raj in Cauvery River at Bhavani during April-May 1939 and 1940. Nests were simple circular pits in sand and silt behind projecting slabs of rocks. Only the male was seen and fertilized eggs were not found in the nest. On close examination the entire ventral surface of the breeding male's body was inflamed and red in colour; there were villiform processes, with dilated ends and orifices, suspended from the body surface below. The fertilized eggs were incubated attached to the villiform processes of the male. The hatchlings congregate in a dense shoal under the parent and feed on a milky white protein-rich substance secreted by the highly vascularised ventral skin of the male fish. Largest fry collected from the nest measured 36 mm. (Sundara Raj, 1962). Others have reported fry leaving the nest when they are 40-45 mm.

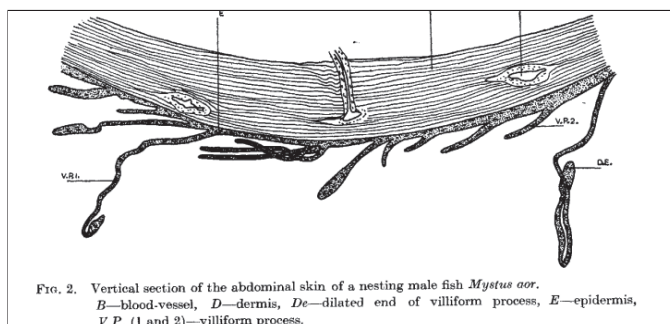


FIG. 2. Vertical section of the abdominal skin of a nesting male fish *Mystus aor*. B—blood-vessel, D—dermis, De—dilated end of villiform process, E—epidermis, V.P. (1 and 2)—villiform process.

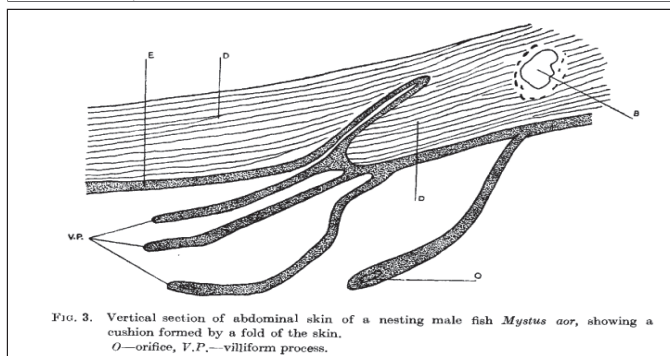


FIG. 3. Vertical section of abdominal skin of a nesting male fish *Mystus aor*, showing a cushion formed by a fold of the skin. O—orifice, V.P.—villiform process.

Sections of the abdominal skin of the male Sperata [=Mystus] aor showing villiform processes among which fertilized eggs are incubated and hatchlings are nourished [Figures Credit: Dr. B. Sundara Raj; Courtesy: Proc. NISI, 1962, 28 B (3): 193-200]

Distribution

Sperata seenghala (Sykes, 1839) is widely distributed in southern Asia from Afghanistan, through Pakistan, India, Nepal, to Bangladesh, with some reports of occurrence from Thailand and Yunnan Province of China and probably also in Myanmar (Burma). In India it occurs in all major river systems: Beas & Sutlej (Indus), Ganga, Yamuna, Brahmaputra, Narmada, Godavary, Krishna and Cauvery, and the associated lakes, flood plains, wetlands, etc.

Fisheries

The Giant River-catfish, *Sperata seenghala*, is a commercially important species contributing substantially to the total inland fish production in South Asia. It is one of the most preferred food fish in north and north-western States of India because of its tasty flesh and few intramuscular bones. It fetches higher price than Carps. In commercial importance it is ranked only next to *Hilsa ilisha*. It is fished using hook & line, drag net, gill net, purse net, traps, etc, in the different river systems in India. Being a carnivore, it is a popular game fish; adults fight well when hooked and provide good sport to anglers.



Sperata seenghala regularly captured from Priyadarsini Jurala Project (PJP), a major Reservoir across River Krishna in Mahabubnagar district, Telangana State: a large specimen (above) and ice-packing in thermocol box (below) [Photo Credit: Dr. B. Laxmappa, District Fisheries Officer, Jogulamba Gadwal district, Telangana State]

Current Population Trend

According to the IUCN Red List, *Sperata seenghala* is assessed at 'Least Concern'. Surveys indicate that it is still relatively abundant. However, closer monitoring of its fisheries is necessary because it is intensively fished for food and is vulnerable to overfishing and degradation of niche habitats required for its breeding.

Aquaculture

Although the Giant River-catfish is in great demand in the domestic markets, its aquaculture potential has not been explored in India (Tripathi, 1996).

Successful Pond Breeding & Rearing in Bangladesh:

With a view to conserve as well as to culture the endangered *Sperata seenghala*, known as “Guizza Air”, attempts were made and significant success achieved in Bangladesh, in breeding the fish naturally and rearing the fry and

fingerlings in earthen ponds, at the Freshwater Station, Fisheries Research Institute, Mymensingh (M. Aminur Rahman, et al., 2014) and at Desh Bondhu Hatchery, Mymensingh (Md. Ekramul Hasan, et al., 2016).

To facilitating natural breeding, 10-15 nests (Pits 0.7 m diameter and 0.3 m deep) were artificially created in 400 sq. m earthen ponds; 10-30 pairs of *S. seenghala* breeders (650-1,200 g) were stocked in mid February; about 3,000-18,000 fry (mean length 1.74-4.60 cm, weight 0.20-0.36 g) were netted by draining; fry were stocked in nursery ponds and fed commercial starter feed; after two months of rearing (at a stocking density of 100,000 fry/ha), fingerlings attained average length of 9.15 cm, average weight of 4.18 g and survival rate was 69%. [For details see articles cited under Further Reading]

Further Reading

Source: *The Wealth of India Vol. IV, Fish and Fisheries*, CSIR, New Delhi, 1962; en.wikipedia.org/wiki/Sperata_seenghala; www.fishbase.se/summary/Sperata-seenghala.html; www.iucnredlist.org/details/166476/0; www.planetcatfish.com/common/species.php?species_id=1120

Gupta Sandipan, 2015. Review on *Sperata Seenghala* (Sykes, 1839), A Freshwater Catfish of Indian Subcontinent. *J Aquac Res Development*, 6 (1): 290, pp 1-6. doi: 10.4172/2155-9546.1000290.

M. Aminur Rahman, A. Arshad, Fatimah Md. Yusoff, S. M. N. Amin, K. Marimuthu & R. Ara (2014). Development of Captive Breeding and Seed Production Techniques for Giant River Catfish *Sperata seenghala*. *North American Journal of Aquaculture*, 76: 2, 97-103. Link to this article: <http://dx.doi.org/10.1080/15222055.2013.855282>.

Md. Ekramul Hasan, AK Jilani Chowdhury and Md. Golam Sarwer (2016). Captive breeding and seed production techniques of Endangered Giant River Catfish *Sperata seenghala*. *Journal of Entomology and Zoology Studies*, 2016; 4(6): 121-126.

3. New/ Innovative Technologies in Fisheries

3.1 'Square Mesh Panels' on Trawl Nets Reduce By-catch and Conserve Marine Demersal Fishery Resources

Marine Fisheries in India

With current estimated total fish production of 10.79 million metric tons (MMT), India is considered the second largest fish producing country in the world. However, a large part of this production is contributed by inland fisheries (3.59 MMT) and aquaculture (4.20 MMT), while the marine fish catches have either been steadily declining or are stagnant (about 3.00 MMT). One of the reasons for decline in marine landings is unsustainable fishing activity – overfishing and consequent depletion of stocks.

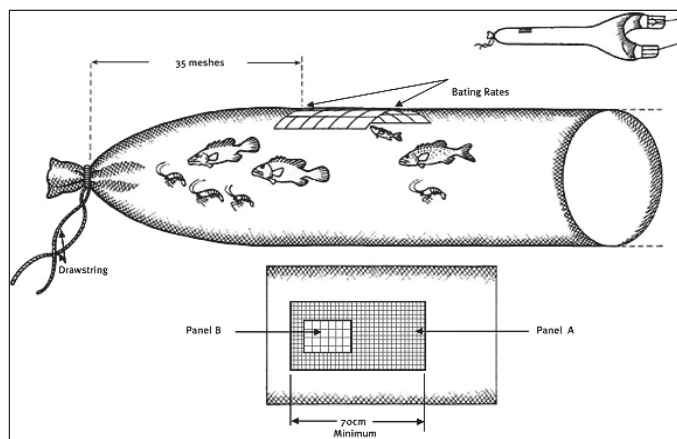
Of the total marine fisheries, demersal fisheries comprise about 45% while pelagic fisheries comprise 55%. Among the marine fishing gears used, bottom trawl nets contribute 44% of the landings. Further, over the years, the number of trawlers doubled, engine horsepower increased by nearly 4 times to 3,448, 570 hp (1998), and the medium trawlers undertaking multi-day voyages carry nearly a dozen different trawl nets each rigged differently and having different **cod-end mesh sizes of 15 to 35 mm** to target commercially highly valued resources ('*Present and Future Scenario of Indian Marine Fisheries*', PPT by Dr. P.U. Zacharia, Head, Demersal Fisheries Division, CMFRI, Cochin).

The trawl nets are generally non-selective and trap even the non-targeted/ unwanted and juvenile fishes which comprise a significant quantity of the by-catch that is discarded at sea. The juveniles are thus deprived the opportunity to grow and contribute to the future breeding stock and to the fishery.

Square Mesh Panel By-catch Reduction Device (BRD)

Recent fisheries regulations in other countries have made it mandatory to fit a By-catch Reduction Device (BRD) to demersal towed gears such as trawls. The square mesh panel is a type of BRD made up of an inner/ central and outer/ peripheral panel of different sized square mesh at a set distance from the drawstring of the trawl net. The mesh size for this panel is specifically designed to exclude target-sized fish. Studies have demonstrated that the square-mesh codend is more selective than the diamond mesh, as it

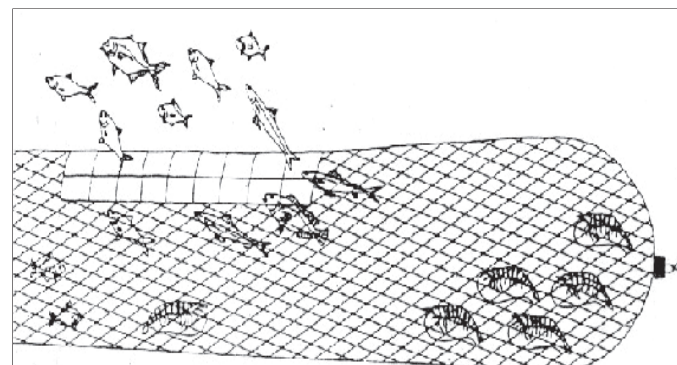
increases the 50% selection lengths of most target species and reduces discards.



Square mesh panel codend is a type of By-catch Reduction Device (BRD) made up of an inner and outer panel of different sized square mesh at a set distance from the drawstring [Illustration Courtesy: The State of Queensland 2017; Source: <https://www.business.qld.gov.au/industries/farms-fishing-forestry/fisheries/fisheries-profiles/trawl-fisheries/reducing-bycatch/square-mesh-panel>]

Square Mesh Panel Material

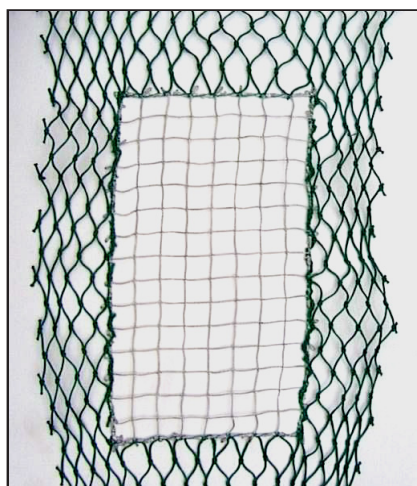
Square-mesh panels are made of either knotless or non-slip knots allowing fish to escape easily. As per regulations, a minimum panel length of 3.0m and minimum panel width of 2.5m is required and the square mesh size varies depending on the targeted fisheries.



Square Mesh Window allows fish to escape upwards through the large square mesh. Size of the window as well as the mesh size varies depending on the targeted fishery [Illustration Courtesy: Fishing Technology Equipments, FAO of the UN]

Square Mesh Panel Construction

Square mesh panels are placed in the upper part of the codend such that they stay open during the tow and juveniles can escape. Ideally, fitting of square mesh panels as complete sections in the tapered portion of trawl net laced onto the corresponding conventional diamond mesh lower section is desirable. The panel is fitted into the existing netting section, by choosing the best joining rates of the square to diamond mesh in the region of the trawl net. Also, positioning an additional square mesh panel at the extension section of net just before the codend helps, because it is where the fish become channelled and more concentrated, providing greater opportunity for directing the fish towards the escape area.



Square mesh panel fitted into a diamond mesh panel of netting [Figures Courtesy: Ken Arkley, 2001. Guidelines on the Rigging of Square Mesh Panels, Seafish, UK]

Initiatives in Sindhudurg district, Maharashtra

The Sindhudurg Coastal and Marine Ecosystem (SCME), which includes the offshore Angria Bank and located at the southern end of Maharashtra's coast, is a major fish landing center. The United Nations Development Programme (UNDP) project, funded by Global Environment Facility (GEF) in partnership with the Ministry of Environment, Forest and Climate Change, Govt. of India and Govt. of Maharashtra, with technical expertise from ICAR-Central Institute of Fisheries Technology and working closely with the local fisherfolk, introduced and popularized the 'square mesh panel' in the codend of trawl gears in Sindhudurg.

The initiative has gone a long way in becoming something that fishermen have embraced in their journey to sustainable

marine fishing. Since 2015, every trawler (total 317) in the district now uses square mesh nets. The fishermen are happy with their catch comprising of only larger and readily marketable fish without any juveniles. Further, they are benefited by the reduced expenditure on diesel as the square mesh nets have reduced the drag and therefore lesser load on trawler engine.

Witnessing the movement underway in Sindhudurg, the Dept. of Fisheries, Govt. of Maharashtra have issued orders proposing the mandatory use of 'square mesh panel nets' for all 17,000 trawlers operating in the State.



The square mesh paneled trawl net, introduced in Sindhudurg region through a partnership between the Govt. of Maharashtra, the UNDP and the CIFT, and adopted by marine fishermen yields better catches and higher profits while conserving marine resources [Photos Credit: Dhiraj Singh; Courtesy: UNDP India]

Conclusions and Recommendations

The universal adoption of the square mesh codend would facilitate recovery of the currently depleted fish stocks. However, a significant reduction in fishing effort, fleet capacity and fishing days in parallel with an increase in gear selectivity, is required for the recovery of highly exploited or overexploited demersal species.

[Source: (i) The UN: <http://www.in.undp.org/content/india/en/home/ourwork/environmentandenergy/successstories/>

[fishing-for-the-future.html](http://www.fishing-for-the-future.html); (ii) Ken Arkley, 2001. *Guidelines on the Rigging of Square Mesh Panels*, Seafish, UK; (iii) The State of Queensland: <https://www.business.qld.gov.au/industries/farms-fishing-forestry/fisheries/fisheries-profiles/rawl-fisheries/reducing-bycatch/square-mesh-panel> (iv) Squaring the diamond mesh- How square-meshed trawl nets will benefit fish and fishermen in the Mediterranean. www.panda.org/mediterranean/

4. NFDB Initiatives

4.1 First meeting of the Technical Management and Advisory Committee on NFDB-NFFBB held at Krishi Bhavan, New Delhi

The first meeting of the Technical Management and Advisory Committee (TMAC) constituted to review the activities of the National Freshwater Fish Brood Bank (NFFBB), a project undertaken by the NFDB at Kausalyaganga, Bhubaneswar, Odisha, was held on 18 May 2017 at Krishi Bhavan, New Delhi. Shri Aditya Kumar Joshi, Joint Secretary (Fy), DADF and Chief Executive, NFDB; Dr. B.K. Upadhyaya, Director of Fisheries, Odisha; Dr. Dilip Kumar, Ex Vice-Chancellor and Director, CIFE, Mumbai; Dr. Kuldeep Kumar Lal, Director, NBFGR, Lucknow; Dr. P. Routray, Principal Scientist, CIFA, Bhubaneswar; Shri L. Shankar, Joint Commissioner, DADF; Shri S.K. Rath, Asst. Commissioner, DADF; Ms. Poonam Rani, Senior Technical Assistant, DADF; and NFDB Officials Dr. B.K. Chand, Executive Director (Tech) and Shri Chandan Chetri, Senior Executive (Tech) participated in the TMAC Meeting.

The meeting was chaired by Shri Aditya Kumar Joshi, Joint Secretary (Fy), DADF and Chief Executive, NFDB. Dr. B.K. Chand, Executive Director (Tech), NFDB, made a detailed presentation on activities and status of the NFDB-NFFBB Project. After detailed deliberations, the following action points emerged:

- (i) The Central Institute of Freshwater Aquaculture (CIFA), Bhubaneswar, is to supply 2.5 crore spawn of Janyanti Rohu and Improved Catla to NFFBB during 2017-18.
- (ii) Standard Operating Procedures (SOPs) for management of NFFBB and for rearing of breeder seeds at NFFBB to be furnished by CIFA. NFDB to publish them as a booklet for wider circulation among all the States/UTs.



The first meeting of the TMAC held under the Chairmanship of Shri Aditya Kumar Joshi, Joint Secretary (Fy), DADF and Chief Executive, NFDB (above) and members of the Committee (below), at Krishi Bhavan, New Delhi

- (iii) NFFBB to start preparing nursery ponds for stocking spawn of Jayanti Rohu and Improved Catla. Existing residual stock, if any, to be shifted to rearing ponds.
- (iv) NFFBB to move forward with the single objective of raising spawn of Jayanti Rohu and Improved Catla to fry and fingerlings for distribution to States/UTs.
- (v) The existing brood stock at NFFBB, that are of a older generation of Jayanti Rohu and Improved Catla, are to be disposed off in a phased manner following due procedure.

4.2 National Consultation Meet on 'Mariculture and Open Sea Cage Culture Development in India' held at CMFRI, Mandapam, Tamil Nadu

A two-day National Consultation Meet on 'Mariculture and Open Sea Cage Culture Development in India' was organized by the Dept. of Animal Husbandry, Dairying & Fisheries (DADF), Govt. of India, in collaboration with NFDB and the Central Marine Fisheries Research Institute (ICAR-CMFRI), during 8-9 June 2017 at the Regional Centre of CMFRI, Mandapam, Ramanathapuram district, Tamil Nadu.

In this connection, on 7 June 2017 a day ahead of the meet, Shri Devendra Chaudhry, Secretary, DADF, inspected sites where Seaweeds (Macroalgae) were being grown in shallow coastal waters by Self Help Groups and fishers. Dr. CRK Reddy, Chief Scientist, Central Salt & Marine Chemicals Research Institute (CSIR-CSMCRI), Bhavanagar, Gujarat, explained to the Secretary about the technology involved in Seaweed Cultivation and the process of preparing various products from Seaweeds.



Shri Devendra Chaudhry, Secretary, DADF, inspecting Seaweeds cultivated on rafts while Dr. CRK Reddy, Chief Scientist, CSMCRI, explains about the technology

The Secretary, DADF, also inspected Open Sea Cages wherein marine fish such as Cobio and Silver Pompana are being cultivated. Dr. A. Gopalakrishnan, Director, ICAR-CMFRI, and Scientists of the Mandapam Regional Centre accompanied.

On 8 June 2017, Shri Devendra Chaudhry, Secretary, DADF, participated in the Inaugural Session of the two-day National Consultation Meet on 'Mariculture and Open Sea Cage Culture Development in India' and addressed the gathering.

During the Technical Session, presentations were made by scientist and experts: (i) Mariculture - Seed Production



Shri Devendra Chaudhry, Secretary, DADF, inspecting Open Sea Cages while Scientists of CMFRI explain about the technology

Technology - Dr. Imelda Joseph, HoD & Pr. Scientist, CMFRI, Kochi; (ii) Open Sea Cage Culture and Potential of Mariculture - Dr. Philipose, Principal Scientist, CMFRI, Karwar; (iii) Open Sea Cage Culture - Dr. Kirubakaran, Director, NIOT, Chennai; (iv) Sea Weed – Wonder Plants of the Sea - Dr. Sakthivel, President, Aquaculture Foundation of India, Chennai; (v) Role of RGCA and Crab Farming / Fattening - Dr. Kanthan, Project Director, RGCA, Sirkali; (vi) Initiatives of ICAR-CIBA to popularize Brackishwater Aquaculture Technologies among farmers - Dr. Kailasam, Principal Scientist, CIBA, Chennai; (vii) Potential for Seaweed Culture - Dr. CRK Reddy, Chief Scientist, CSMCRI, Bhavanagar; (viii) Dr. Paul Pandian, Fisheries Development Commissioner, Govt. of India, made a presentation on Mariculture Policy and Strategy Document.



Dr. Paul Pandian, FDC, Govt. of India, making a presentation on Mariculture Policy and Strategy Document

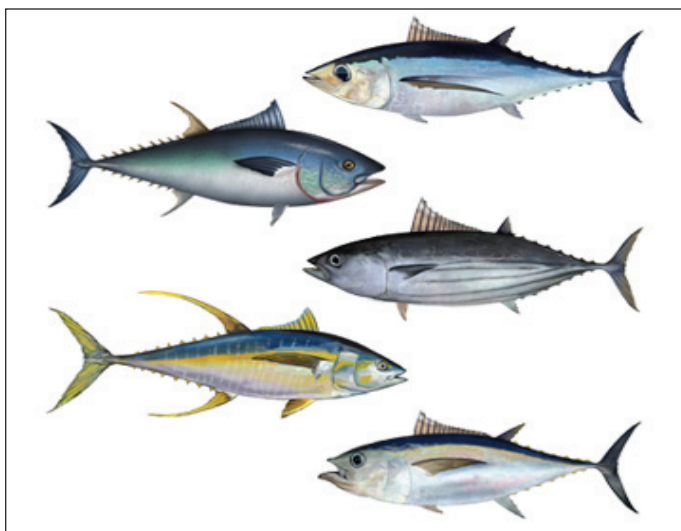
On the second day of the Meet, an 'Interface of State Officials with Scientists / Experts and Discussion on Strategies for Mariculture Development' was arranged. Subsequently, discussions and deliberations were held to prepare the Draft Policy on Mariculture.

Visits to Sea Weed Culture and Open Sea Cage Culture sites, Marine Fish Hatchery and Shore Laboratory of CMFRI Regional Centre, Mandapam, were arranged for the participants.

5. Important Events

5.1 The United Nations Celebrates first ever 'World Tuna Day' on 2 May 2017

The celebration for the first time by the United Nations of **World Tuna Day on 2 May** is an important step in recognizing the critical role of tuna to sustainable development, food security, economic opportunity, and livelihoods of people around the world. Highly migratory tuna species account for 20% of the value of all marine capture fisheries, and over 8% of all internationally traded seafood. They play a key role to ensuring a healthy and robust marine ecosystem. Nearly two-thirds of the tuna found in restaurants and supermarkets around the world comes from the Pacific Ocean, hence the Pacific SIDS (Small Island Developing States) are playing an active role on this initiative. World Tuna Day provides a key opportunity to discuss solutions to ensure increased economic benefits to SIDS and LDCs (Least Developed Countries) from the sustainable use of marine resources and in addressing the challenges that are affecting tuna stocks.



Assorted Tuna Species [Image Courtesy: NOAA's Fishwatch, USA, Public Domain; Source: <https://en.wikipedia.org/wiki/Tuna>]

Regrettably with the decline in the health of the Ocean, the fish stocks including tuna face growing threats and an uncertain future. The celebration of World Tuna Day, a month ahead of the Ocean Conference held from 5 to 9 June 2017, at UN Headquarters is a good opportunity to

highlight the importance of reversing the decline in the health of the Ocean to ensure sustainable management of marine life, such as tuna, that we are so dependent on. In support of World Tuna Day, the UN urges all Governments, cities, businesses and civil society organizations to take action.

[UN Press Release: <http://www.un.org/pga/71/2017/05/02/un-celebrates-first-ever-world-tuna-day/>]

5.2 'World Environment Day' observed on 5 June 2017

Global: World Environment Day is the biggest annual event for positive environmental action and takes place every 5 June. This year's host country Canada chose '**Connecting People to Nature**' as the theme for World Environment Day 2017. This year's theme reminds us to think about how we are part of nature and how intimately we depend on it. It challenges us to find fun and exciting ways to experience and cherish this vital relationship. World Environment Day is a day for everyone, everywhere. Since it began in 1972, global citizens have organized many thousands of events, from neighbourhood clean-ups, to action against wildlife crime, to replanting forests.

[Source: <http://worldenvironmentday.global/en/about/connecting-people-nature>]

India: On the eve of the 44th World Environment Day on 5 June 2017, Hon'ble Prime Minister of India, Shri Narendra Modi in a radio address, urged citizens to "connect with nature" and to recognize the importance of nature for human well-being. He cited Mahatma Gandhi and wisdom from the Vedas: "Whenever you come in contact with a natural condition, a new spirit emerges from within you. So the global campaign of connecting with nature on 5 June should become our individual campaign as well," he said. "If we shall protect the environment, our future generations will reap the benefits." He urged Indians to help with the annual tree-planting drive around World Environment Day, and announced a new push to improve Indian waste management by encouraging people to separate solid waste from compostable waste and ensure more of it can be recycled. Huge volumes of solid waste from India and many other countries leak into the oceans, where it harms plants and fish in ways scientists are only beginning to understand.

Some of it washes up on beaches in places including Mumbai, he said. Shri Modi praised **Afroz Shah** for marshalling the growing band of volunteers who have painstakingly restored the city's Versova Beach from one which was "infamous for its filth ... into a clean and beautiful beach."



Mumbai-based lawyer Afroz Shah (right) and Erik Solheim, Chief of United Nations Environment Programme, clean the Versova beach in Mumbai (Photo Credit: PTI, Courtesy: Financial Express)

Mumbai, Pune, Nainital and Tiruvananthapuram: History was created in India during 2016 when a 2.5-km stretch of the beach at Versova, Mumbai, was cleaned of over 2.84 lakh kilograms of trash manually by volunteers. The initiative started by a local lawyer Mr. Afroz Shah and the drive by Versova Residents Volunteers (VRV) and joined by Mr. Eric Solheim, Chief of United Nations Environment Programme (UNEP), Mr. Lewis Pugh, the UN Patron of the Oceans, and representatives of the All India Plastic Manufacturers Association, members of the civil societies, film celebrities, students, etc, became such a mega event that the UNEP went live during the cleanup drive straight from Versova. Mr. Pugh submitted a report with findings to the UNEP, to assess whether this model can be replicated across South Asia and the world.

The 'UN Environment' recognized Afroz Shah's achievement with a '*Champion of the Earth*' award. Shah's initiative has helped raise awareness of the growing problem of marine litter, which is the focus of UN Environment's **Clean Seas** campaign. This year, on 5 June 2017, clean-ups were undertaken in the lake city of Nainital, along the Mutha River in Pune, and on the beach in Thiruvananthapuram.



The biggest beach cleanup in history was done at Versova, Mumbai on 6 August 2016 in which United Nations' Patron of the Oceans, Lewis Pugh participated (Photo courtesy: Twitter/Lewis Pugh)

[Source: <http://worldenvironmentday.global/en/news/india-mark-world-environment-day-massive-waste-management-drive>;

<https://www.thequint.com/environment/2016/08/07/mumbai-versova-beach-undergoes-drastic-makeover-in-historic-clean-up-drive-by-residents-volunteers-un-lewis-pugh>]

Sikkim: In Sikkim "World Environment Day" was celebrated on 5 June 2017 by ranching Mahseer fingerlings in Teesta River at Dikchu, Sikkim for rehabilitation and conservation. Shri Somnath Poudyal, Minister of Fisheries, Govt. of Sikkim, graced the occasion as the Chief Guest. The Minister highlighted the significance of natural biodiversity and its importance to conserve indigenous fish fauna of the region in order to bring our river back to life.

Dr. A .K. Singh, Director, ICAR-DCFR explained the inevitability to conserve Mahseer which is a keystone species in the river. 5000 fingerlings produced at DCFR Mahseer Hatchery, Bhimtal, were transported to Sikkim on the occasion. An awareness camp was also organized on the occasion to create awareness among the public to protect the natural environment of the river to save the magnificent Mahseer, the "Tiger of Water".



Mahseer Seed Ranching in Teesta River of Sikkim on the occasion of World Environment Day 5 June 2017 at Dikchu, Sikkim

[Source: Directorate of Coldwater Fisheries Research (ICAR), Bhimtal, Uttarakhand]

5.3 ‘Kisan Kalyan Mela’ organized on the occasion of ‘Champaran Satyagraha’ centenary at Motihari, Bihar

On the occasion of centenary celebration of *Champaran Satyagraha* (First Civil Disobedient Movement by Father of the Nation Shri M. K. Gandhi) at Motihari, East Champaran, Bihar, the Govt. of India organized a “*Kisan Kalyan Mela*” during 15- 19 April 2017 in Zila School Maidan, at Motihari. It was inaugurated by Shri Radha Mohan Singh, Hon’ble Union Minister for Agriculture in presence of Hon’ble Sarva Shri Promod Kumar, Sachin Prasad Singh, Babulal Gupta, Krishna Nandan Paswan, Dr. Arvind Agarwal, Shri Devendra Chaudhari, Dr. T. Mohapatra and others dignitaries.

On 14 April, 2017 “*Matsya Sammelan*” was organized under the chairmanship of Shri Radha Mohan Singh, Hon’ble Minister for Agriculture. He emphasized on doubling fish production in Bihar State by 2020, for which Govt. of India is providing sufficient funds with 50% subsidy under Blue Revolution. To double the income farmers need to adopt need based Integrated Fish Farming with Agriculture, Horticulture, Livestock and Honey Bee Culture, etc, he added. Dr. Radheyshyam, Sr. Consultant (Fisheries), NFDB, participated in the *Mtshya Sammelan*.

NFDB put up a stall in the “*Kisan Kalyan Mela*” to display its activities and the Central Sector Scheme on Blue Revolution to bring awareness among the fish farmers and entrepreneurs about different schemes and on how to avail financial assistance offered by Gov. of India for the development of fisheries in the state of Bihar. The NFDB Stall was visited by Shri Radha Mohan Singh, other dignitaries and a large number of farmers



Shri Radha Mohan Singh, Hon’ble Union Minister for Agriculture, addressing the gathering at ‘Kisan Kalyan Mela’ (above), fish farmers visiting NFDB Stall (middle) and Dr. Radheyshyam, Sr. Consultant (Fisheries), NFDB, explaining about Blue Revolution Schemes to the farmers (below) at Motihari, East Champaran, Bihar

5.4 International Symposium and School on Aquatic Animal Epidemiology organized under NFDB funded NSPAAD Project at NBFGR, Lucknow, Uttar Pradesh

(i) International Symposium on Aquatic Animal Health and Epidemiology for Sustainable Asian Aquaculture

The two-day symposium was organized, during 20-21 April 2017, at ICAR-National Bureau of Fish Genetic Resources,

Lucknow, as part of the NFDB funded project on 'National Surveillance Programme for Aquatic Animal Diseases' (NSPAAD). 200 participants from India and abroad attended the symposium. There were 16 keynote lectures by the experts from India and abroad. Prof. Larry Hammell, Canada mentioned that application of simple epidemiological principles in the surveillance program can help in drawing accurate conclusions about the distribution pattern of fish diseases. Prof. K.L. Morgan, UK highlighted the importance of involving farmers in the reporting of diseases so that losses can be minimized. Prof. I. Karunasagar, FAO, Rome advised for judicious use of drugs and antimicrobials in aquaculture for reducing antimicrobial resistance.



International Symposium on Aquatic Animal Health and Epidemiology for Sustainable Asian Aquaculture organized at ICAR-NBFGR, Lucknow

Keynote lectures were also delivered on emerging pathogens like carp edema virus, oomycete and fish and shellfish diseases by Prof. Mansour-El-Matbouli, Dr. Chris Hauton, Prof. Valerie J. Smith, Prof. Pieter van West, Dr. K.V. Rajendran, Dr. K.K. Vijayan, Dr. P.K. Sahoo and Dr. N.K. Sanil. In addition, scenario on emerging Aquatic Animal Diseases in the Asia-Pacific Region was presented by Dr. Eduardo. M. Leaño, Network of Aquaculture Centres in Asia-Pacific (NACA), Thailand. Policy Framework for Preventing Spread of Diseases in India was also discussed by Dr. A. G. Ponniah, former Director, NBFGR, Lucknow. The experts were of the opinion that more research should be carried out on two important diseases of fish and shrimp i.e. epizootic ulcerative syndrome and white spot disease for their management. Dr. C.V. Mohan from WorldFish, Malaysia said that there is need to look into disease concern of aquaculture of small indigenous fish species, which are important for nutritional security of rural household. Dr.

Kuldeep K. Lal, Convener of the symposium and Director, ICAR-NBFGR highlighted the importance of good quality seed to avoid genetic erosion and disease susceptibility.

The symposium was followed by a strategy planning workshop, in which invited experts and representatives from the aquaculture industry participated and inputs from the Symposium was deliberated for preparing future road map of the aquatic animal disease surveillance programme in the country.

(ii) Epidemiology School on Aquatic Animal Diseases

The school was organized at ICAR-NBFGR, Lucknow, during 24-28 April 2017, for scientists involved in the NFDB funded National Surveillance Programme for Aquatic Animal Diseases (NSPAAD). The programme was conducted by Prof. Kenton L. Morgan, Emeritus Professor of Epidemiology, Institute of Veterinary Science, University of Liverpool, U.K. 21 researchers from 8 Institutes across the country involved in the NSPAAD participated. Some of the topics covered include: population surveys – estimation of disease frequency; questionnaire design; bias and confounding; identification of risk factors for disease from observational studies using univariable analysis with an introduction to multivariable analysis; introduction to modelling and simulation; introduction to clinical trials and outbreak investigation.



Epidemiology School on Aquatic Animal Diseases organized at ICAR-NBFGR, Lucknow

[Source: ICAR-National Bureau of Fish Genetic Resources, Lucknow, UP]

5.5 NFDB Participates in 'Aqua Aquaria India 2017' at Mangalore, Karnataka

The 'Aqua Aquaria India 2017' was organized by the Marine Products Export Development Authority (MPEDA),

Ministry of Commerce & Industry, Govt. of India, during 14-16 May 2017 at Nehru Maidan, Mangalore, Karnataka. The event was inaugurated by Shri Pramod Madhwaraj, Minister for Fisheries, Karnataka, in the presence of Shri Nalin Kumar Kateel, Mangaluru MP, Dr. K. Haribabu, MP from Andhra Pradesh and MPEDA Member, Shri J.R. Lobo, MLA, Dr. A. Jayathilak, Chairman, MPEDA, and others. NFDB participated as a 'Gold Sponsor' contributing an amount of Rupees 5.00 lakh to the MPEDA for organizing the AAI-2017 event.

Shri Madhwaraj in his inaugural address said it is for the first time that the Aqua Aquaria India (AAI) was being organized in the country's west coast, and that "India's west coast, comprising states like Gujarat, Maharashtra, Goa and Karnataka, also offer huge potential for aquaculture that needs to be tapped with ecological safeguards." Dr. K. Hari Babu said that aquaculture is not limited to coastal areas as it is making big strides in landlocked States like Haryana.

The AAI-2017 provided a platform for showcasing the latest technological interventions in aquaculture and ornamental fish culture. Internationally acclaimed experts on aquaculture from Australia, USA, Singapore, Thailand, Indonesia, Malaysia, and Israel, besides India, addressed Technical Sessions on topics of current interest.

NFDB put up a stall displaying information on Central Sector Scheme 'Blue Revolution' and the newly launched 'Pilot Project on



MPEDA organized 'Aqua Aquaria India 2017' exhibition venue (above) and NFDB Stall (below) at Nehru Maidan, Mangalore, Karnataka

Ornamental Fisheries'. Dr. Ajay Pandey, Consultant, and Dr M. Vishwas Rao, Jr. Consultant, NFDB, explained the activities and schemes to visitors and distributed NFDB publications. Dr. Ajay Pandey also participated in the interactive workshop on 'Ornamental Fisheries its Status and Export Issues'. The Chairman, MPEDA presented a memento to NFDB for its participation as Gold Sponsor.

6 NFDB Field Notes

6.1 Activities at National Freshwater Fish Brood Bank (NFDB-NFFBB), Bhubaneswar, Odisha

(i) Genetically improved Brood Fish supplied to Govt. Fish Farm Kausalyaganga, Bhubaneswar:

Genetically improved Brood Fish of Amur Carp (*Cyprinus carpio*) and Catla/ Bhakur (*Catla catla*) were transferred



*Transfer of genetically improved brooders of Amur Carp- *Cyprinus carpio* and Bhakur- *Catla catla* from NFDB-NFFBB to Govt. Fish Farm at Kausalyaganga, Odisha*

from NFBB to Govt. of Odisha Fish Farm at Kausalyaganga, Bhubaneswar, to support their quality fish seed production programme. A total of 310 kg brood fish were supplied.

(ii) NFFBB participates in "Krishi Fair – 2017" at Puri, Odisha:

The 8th "Krishi Fair-2017" was organized during 15-19 May 2017 at Puri, Odisha. An exhibition was arranged which was inaugurated by Dr. Damodor Rout, Hon'ble Minister for Agriculture, Govt. of Odisha. He emphasized to increase the productivity and production of agriculture and allied crops along with fisheries in order to increase the income of the farmer. NFBB set up a stall in which NFDB Activities and Blue Revolution Schemes of DAHDF were displayed

through flex banners and publications and explained to visiting fish farmers, fishers, entrepreneur, fisheries professionals and students by Mr. Vipin Chandra Nautiyal, EA (Tech.).



NFDB-NFFBB Exhibition Stall at “Krishi Fair- 2017” organized at Puri, Odisha

(iii) Fisheries Officials and Students from Manipur visit NFFBB, Bhubaneswar:

A group of Fisheries Officials and Students from Manipur visited NFFBB Kausalyaganga, Bhubaneswar, Odisha, on



Dr. Radheyshyam, Senior Consultant (Fisheries) briefing Fisheries Officials and Students from Manipur during their visit to NFDB-NFFBB, Bhubaneswar, Odisha

15 June 2017. Dr. Radheyshyam, Senior Consultant (Fisheries) briefed the group about NFFBB activities and other aspects of fish culture and brood fish rearing. He also explained about the different Schemes launched under Blue Revolution.

7. Fishers & Farmers News

7.1 Fishermen of Saurashtra Region, Gujarat, undergo training in adoption of ‘Square Mesh Codend for Trawl Nets’

The Veraval Research Centre of ICAR-CIFT, in association with NETFISH-MPEDA, conducted 3-day training-cum-demonstration programmes on ‘Conversion of Diamond Mesh to Square Mesh Codend’ at three locations in Gujarat.

The first programme was conducted on 25 May 2017 at Veraval Centre of CIFT. Shri R. Gupta, Deputy Director, MPEDA, Dr. Ashish Kumar Jha, Scientist-in-charge of the Centre and Shri Mohammed Koya, Scientist-in-charge of ICAR-CMFRI, Veraval, Shri Jignesh Visavadia, Coordinator, NETFISH-MPEDA, participated. Dr. K.K. Prajith and Shri G. Kamei, Scientists, Fishing Technology Division, delivered talks on ‘Square Mesh Codend as a tool for Responsible Fishing’ and on ‘Technical Protocol for Conversion of Diamond Mesh to Square Mesh’. A video on advantages of square mesh over conventional diamond mesh was shown at the end of the session.

Similar programmes were held in Diu and Porbandar on 26 and 27 May 2017, respectively. Dr. Prajith was the

resource person for the technical and practical session at Diu. In Porbandar Shri Kamei handled the session. Shri A. Sakthivel, Asst. Director, MPEDA, Porbandar, participated. In all the three Centres, practical/demonstration session was handled by Shri H.V. Pungera, Senior Tech. Assistant and Shri J.B. Malamdi, Technician.



Fishermen learning ‘Conversion of Diamond Mesh to Square Mesh Codend’ for trawl nets at CIFT Centre, Veraval (left) and at Fishermen Association premises, Porbandar (right) in Gujarat

[Input from: Director, ICAR-CIFT, Matsyapuri, Cochin, Kerala]

8. Fisheries & Aquaculture Industry News

8.1 Progressive farmer of Haryana adopts Recirculation Aquaculture System to boost fish production – A Success Story

Shri Sultan Singh, a progressive fish farmer, established the **Sultan Fish Seed Farm**, in 1984 in village Butana, tehsil Nilokheri, Karnal district, Haryana, in about 100 acres of land in which fish hatcheries, nurseries and culture pounds were established. Latest technology in aquaculture is adopted and the farm supplies quality seed of Indian Major Carps, Exotic Carps, Giant Freshwater Prawn, etc., in bulk quantities to fish farmers of Haryana, Punjab, Rajasthan, Gujrat, Uttar Pradesh and Chhattisgarh States.

Shri Neeraj Chaudhary, son of Shri Sultan Singh, in June 2016 established an indoor Recirculation Aquaculture System (RAS); it comprises of six circular tanks, each of 20 feet diameter and 4 feet depth (= 35,584 litres/ 35.584 m³/ 35.584 tonnes), paddlewheel aerators, mechanical and biological filters, etc. Desi Magur *Clarias batrachus*, Seabass *Lates calcarifer*, Rohu *Labeo rohita* and other Carps were successfully cultured in the Recirculation Aquaculture System. Production ranged from 36 to 130 kg/ m³/ 6-9 months (depending on the species cultured), whereas the maximum yield attained in earthen ponds were 2-3 kg/m³ over the same period. Shri Neeraj Chaudhary also

undertook *Pangasius sutchi* culture in RAS tanks: 9,000 fingerlings were stocked per tank; formulated feed was fed as much as consumed; production obtained was 5.2 tonnes/ tank/ 6 months; average weight of fish was 600 g. He is able to raise two crops per year in RAS tanks and his total yields are: 5.0 tonnes/tank x 6 tanks x 2 crops = 60.0 tonnes per year. The *Pangasius sutchi* weighing an average of 600 g each were sold live at a farm-gate price of Rs. 85.00/kg, while the total production cost was Rs. 40.00/kg (50% profit). According to the farmer, the most significant aspect of this RAS is that he is able to reuse 90% of the water continuously and adds only 10% new water to the system.

Shri Neeraj Chaudhary is also a successful entrepreneur and undertakes diverse fisheries activities. He received NFDB financial assistance and established a fish processing unit for manufacturing and marketing value added fish products under the brand names *Fishbite & Crispy*. He also runs a fish feed mill.

At Sultan Fish Seed Farm Rohu, Catla, Mrigal, Grass Carp, Common Carp, Silver Carp and also Cat Fish are bred routinely. Breeding commences from the last week of March and continues for 7 months till the end of October. More than 105 crore spawn are produced per season; 9-10 crore fry in 7 months, 10-15 lakh fingerlings/year and 2 lakh yearlings/year. The growout production rate of food fishes is 22 tonnes/ 1.5 ha/ year. The farmer is also undertaking shrimp and sea bass culture in saline areas.



Indoor Recirculation Aquaculture System (RAS): Circular Tanks with aerators (above) and the Mechanical and Biological Filters (below), installed by Shri Neeraj Chaudhary at Sultan Fish Seed Farm, Butana village, Karnal district, Haryana State



Shri Neeraj Chaudhary (in check shirt), progressive fish farmer and entrepreneur with fisheries officials at the fish hatchery of Sultan Fish Seed Farm in Butana village, Karnal district, Haryana State



Shri Neeraj Chaudhary and Dr. Radheyshyam at the nursery and rearing ponds of Sultan Fish Seed Farm in Butana village, Karnal district, Haryana State.

Shri Neeraj Chaudhary has been providing direct and indirect employment to several people in the region. Further, at the Sultan Fish Seed Farm training in Induced Breeding of Indian Major Carps is offered to students of several Colleges and Universities in North India. Shri Sultan Singh and his son Shri Neeraj Chaudhary's contribution to fisheries sector were recognized by many Government and Non-Government Organizations in the country and they were honoured with several awards.

[Inputs from: Dr. Radheyshyam, Sr. Consultant (Fisheries) and Ms. Dorothy, M.S., Executive Assistant (Technical), NFDB, Hyderabad, and personal communication]

9. NFDB News

9.1 Mrs. I. Rani Kumudini, IAS, takes over as Chief Executive of NFDB

Mrs. I. Rani Kumudini, IAS, took over the charge of the post of Chief Executive in the National Fisheries Development Board (NFDB), Hyderabad, on deputation basis w.e.f. 30th June 2017. Prior to this appointment, Mrs. I. Rani Kumudini, IAS, held the post of Joint Secretary in the Department of Agriculture, Cooperation and Farmers Welfare, MOAFW, Govt. of India, New Delhi.



Mrs. I. Rani Kumudini, IAS, who assumed charge as the Chief Executive of NFDB, being welcomed by Executive Director (Technical) and Senior Executive (Admin & Fin)

9.2 NFDB Staff – Repatriation, Additional Charge and Transfers

Dr. Sanjay Sarma, Senior Executive (Technical), NFDB Northeast Regional Centre, Guwahati, was repatriated to the parent department and he was relieved of his duties w.e.f 04 April 2017 (AN). Shri Apurba Kumar Das, Senior Executive (Technical), took over as Officer-in-Charge of the NFDB-NERC, Guwahati, Assam.

Shri Subrat Dash, Senior Executive (Technical), NFDB-NFFBB, Bhubaneswar, was repatriated to the parent department and he was relieved of his duties w.e.f 12 May 2017 (AN).

Shri Chandan Chetri, Senior Executive (Technical), NFDB, Hyderabad took over the additional charge of NFDB-NFFBB, Bhubaneswar, w.e.f 09 May 2017.

Shri Vipin Chandra Nautiyal, Executive Assistant (Technical), NFDB, Hyderabad was

transferred to NFDB-NFFBB, Bhubaneswar. He was relieved at NFDB, Hyderabad on 03 May 2017 and he reported for duty at NFDB-NFFBB, Bhubaneswar on 04 May 2017.

Dr. Radheyshyam Senior Consultant (Fisheries), NFDB, Hyderabad was transferred to NFDB-NFFBB, Bhubaneswar. He was relieved at NFDB, Hyderabad on 03 May 2017 and he reported for duty at NFDB-NFFBB, Bhubaneswar on 04 May 2017.

9.3 Karnataka Farmers on an Exposure Visit to Andhra Pradesh visit NFDB

A group of 32 farmers from Bijapur district of Karnataka State visited NFDB on 24 April 2017 as part of their exposure visit to Andhra Pradesh State. A team of officials from Dept. of Fisheries, Govt. of Karnataka lead by Mr. Shrishal S. Ganganalli Senior Assistant Director; Mr. Namdev D. Lamuri, SDA; Mr. Raghavendra B. Kaboele, SDA; Mr. Sidaray S. Suragihalli, FFM and Mr. Santhosh V. Jadav, FFM, accompanied the farmers. The objective is to expose the farmers to the best inland fish/prawn cultivation practices in Andhra Pradesh and encourage them to take up fish farming in a big way. Dr. Bimal Kinkar Chand, Executive Director, welcomed the gathering and briefed about the fisheries sector. Ms. S. Glory Swarupa, Consultant, HRD explained the activities of NFDB and made a presentation on CSS-Blue Revolution Schemes and guidelines in Kannada language. Later, there was a question and answer session.



Farmers and Fisheries Officials from Bijapur district of Karnataka at NFDB, Hyderabad

9.4 'International Yoga Day' observed at NFDB, Hyderabad

International Yoga Day was observed on 21 June 2017 at NFDB. All the Officers, Consultants, Office Staff including outsourced workers participated in the programme. Yogacharya Shri M. Rama Krishna, Physical Director in Yoga from Yoga Sadhana Kendra, Hyderabad, was requested to conduct Yoga Session for the Officers and Staff in NFDB premises. Shri Rama Krishna along with his four disciples Mr. K. Yadagiri Yadav, Mr. C. Siva Krishna, Ms. Hima Bindu and Ms. Sri Vidya visited NFDB, and after a brief introductory talk on the benefits of yoga, the team from 11:00 to 12:00 hours demonstrated and imparted training session on yoga in the lawns of NFDB. All the Officers and Staff of NFDB participated with great enthusiasm and performed various Yoga Aasanas.



Yoga Aasanas being practiced by Officers and Staff of NFDB on the occasion of International Yoga Day on 21 June 2017 in the premises of NFDB, Hyderabad

10. NFDB in the Media

**স্বাস্থ্যসন্মত মৎস্য পরিচর্যা শীর্ষক
ৰাজ্যিক ভিত্তিত কর্মশালা**

গুৱাহাটী, ৩ জুন : মীন বিভাগৰ উদ্যোগত তথা বাণিজ্য মীন উন্নয়ন পৰিষদৰ সৌভাগ্যত আৰু কেন্দ্ৰীয় অৰ্থসচিবৰ মীন বিভাগৰ প্ৰত্যক্ষাৱহৃত যোগা ৩১ মে'ত এজন বাণিজ্যিক ভিত্তিত কর্মশালা অনুষ্ঠিত হ'ল। মীন বিভাগ আৰু প্ৰকল্পভিত্তিত শৰ্মাৰ আঁত ধৰা অনুষ্ঠানটিত মীন বিভাগৰ সৰ্বোচ্চ স্তৰত উপস্থিত আছিল। মীন বিভাগৰ সৰ্বোচ্চ স্তৰত উপস্থিত আছিল। মীন বিভাগৰ সৰ্বোচ্চ স্তৰত উপস্থিত আছিল।

FRIDAY, JUNE 2, 2017 THE ASSAM TRIBUNE, GUWAHATI 5

Stress on hygienic handling of fish

STAFF REPORTER

The workshop was attended by senior officials of the Department of Fisheries, Assam, organised a workshop on hygienic handling of fishes in collaboration with ICAR-Central Inland Fisheries Research Institute, Regional Centre, at the ICAR-CIFRI auditorium on Wednesday.

**স্বাস্থ্যসন্মত মৎস্য
পরিচর্যা শীর্ষক কর্মশালা**

গুৱাহাটী, ৩১ মে' : মীন বিভাগৰ উদ্যোগত তথা বাণিজ্য মীন উন্নয়ন পৰিষদৰ সৌভাগ্যত আৰু কেন্দ্ৰীয় অৰ্থসচিবৰ মীন বিভাগৰ প্ৰত্যক্ষাৱহৃত যোগা ৩১ মে'ত এজন বাণিজ্যিক ভিত্তিত কর্মশালা অনুষ্ঠিত হ'ল। মীন বিভাগ আৰু প্ৰকল্পভিত্তিত শৰ্মাৰ আঁত ধৰা অনুষ্ঠানটিত মীন বিভাগৰ সৰ্বোচ্চ স্তৰত উপস্থিত আছিল। মীন বিভাগৰ সৰ্বোচ্চ স্তৰত উপস্থিত আছিল।

11. Announcements

11.1 Tenth Symposium on Diseases in Asian Aquaculture (DAA 10)

The “*10th Symposium on Diseases in Asian Aquaculture (DAA10)*” will be held during 28 August – 1 September 2017 at The ANVAYA Beach Resort, Bali, Indonesia, by the Fish Health Section, Asian Fisheries Society, in collaboration with Indonesian Ministry of Marine Affairs and Fisheries

[Source: <https://www.asianfisheriessociety.org/events.php>]

11.2 Aquaculture Taiwan

The “*Aquaculture Taiwan Expo & Forum*” will be held at Taipei Nangang Exhibition Center on 28 – 30 September 2017. Co-organized with Taiwan Council of Agriculture, Aquaculture Taiwan Expo & Forum is the first B2B trade show focusing on aquaculture industry in Taiwan which is being held concurrently with Asia Agri-Tech Expo & Forum and Livestock Taiwan Expo & Forum. This all-in-one trade show offers the perfect opportunity to establish contact with international suppliers & industry professionals and to learn state-of-the-art technology. The event will bring suppliers presenting complete supply chain of aquaculture industry including but not limited to Aquaculture Technology & Equipment, Disease & Health Management, Breeding & Hatchery Equipment, Cold Chain Equipment, Food Safety, Hygiene & Traceability Solutions, Feed & Feeding Equipment, Packaging Equipment and Recirculation Systems.

11.3 Eighth International Conference on Fisheries & Aquaculture

The 8th International Conference on Fisheries & Aquaculture - 2017 will be held at Toronto, Canada during 02-04 October 2017. Theme of the conference is ‘*New Era in Fisheries & Aquaculture*’. This is an excellent opportunity for the delegates from universities and institutes to interact with the world class scientists and eminent personalities.

11.4 Global Aquaculture Alliance GOAL Conference

The Global Aquaculture Alliance is celebrating the organization’s 20th anniversary at historic Croke Park in Dublin, Ireland, and is holding a conference during 03-06 October 2017. The theme of this year’s GOAL conference is “*The Next 20: From Promise To Delivery*,” addressing the reality of delivering on seafood sustainability promises in the next 20 years. Since its inception in 2001, no aquaculture conference has been as successful as GOAL at connecting producers and suppliers to the marketplace to discuss the major challenges and opportunities facing responsible aquaculture.

11.5 XIV International Symposium on Aquaculture Nutrition

The “*International Symposium on Aquaculture Nutrition*” has been organized since 1993. This year it will be held at Ensenada Baja California, Mexico during 04-06 October 2017. To date it is the leading discussion forum about nutrition of aquatic organisms in Latin America. It is held every two years and aims to bring together scientific experts, students, producers, commercial and industrial representatives with the objective of sharing the most recent advances in the area of nutrition of aquatic organisms. The Symposium will maintain the original format, where oral presentations (25 + 5 min) are given by invited speakers with international recognition in specific nutrition areas. Hopefully, this will ensure the opportunity for the attendees to exchange opinions and discuss their problems and/or ongoing research to further improve the region’s aquaculture industry.

[Source: www.was.org]



National Fisheries Development Board

(Department of Animal Husbandry, Dairying & Fisheries,
Ministry of Agriculture and Farmers Welfare, Govt. of India)
Fish Building, Pillar No. 235, P.V. Narsimha Rao Expressway
Sardar Vallabhbhai Patel National Police Academy (SVP NPA) Post
HYDERABAD – 500 052

Ph: 040-24000201; Fax: 040-24015568, 24015552

Toll Free Number: 1800-425-1660

Facebook: www.facebook.com/nfdbindia

Website: <http://nfdb.gov.in>

Give your feedback to:
matsyabharat@gmail.com

[View Back Numbers of 'Matsya Bharat' at: <http://nfdb.gov.in/newsletters-archives.htm>]