Technical Report of Conference on

13th Indian Fisheries & Aquaculture Forum

Fostering Indian Fisheries and Aquaculture for Attaining Sustainable Development Goals

23-25 February, 2024 • Kolkata, West Bengal

Organizing Partners

Technical Report on

The
13th Indian Fisheries
&
Aquaculture Forum

Fostering Indian Fisheries and Aquaculture for Attaining Sustainable Development Goals

Kolkata
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The 13th Indian Fisheries & Aquaculture Forum
Fostering Indian Fisheries and Aquaculture for Attaining Sustainable Development Goals

Kolkata, 23-25 February 2024

Recommendations

The 13th Indian Fisheries & Aquaculture Forum on "Fostering Indian Fisheries and Aquaculture for Attaining Sustainable Development Goals" was organized jointly by Asian Fisheries Society Indian Branch (AFSIB), ICAR-Central Inland Fisheries Research Institute (ICAR-CIFRI), Inland Fisheries Society of India (IFSI)at the Biswa Bangla Convention Centre, Kolkata during 23-25 February 2024. More than 1300 researchers, academicians, fishers & fish farmers, industrialists participated in the 3-day long deliberations that included 45 Technical sessions/sub-sessions besides 4 Satellite Symposia and 5 Conclaves including Farmers' Meet and Industry Conclave. The major recommendations that came out of the grand event for development of fisheries and aquaculture sector of the country are:

- Fisheries & aquaculture is one of the fastest growing sectors, and India should leave no stone unturned to enhance fish production further. All the available water resources, including newly excavated Amrit Sarovars may be explored for fish production. National Fish Coordination Committee may be formed to promote domestic consumption and enhance demand of fish and fish products.
- Post-harvest losses in fisheries must be reduced from present 30-40%. The country should emphasize on development of modern processing technologies, their field level validation as well as development of modern and workers-friendly physical infrastructures for processing of wastes, fish drying and by-product preparations to reduce post-harvest loss, generate higher income, and make environment greener.
- Concerted efforts may be made for quality seed production, development of easy seed transport mechanisms, diversification of fish species and culture techniques including enclosure culture of high value fish species, maintaining water quality, reduce disease loss, higher use of unconventional feed resources to reduce inter-sectoral competition, reduce market volatility, etc. to make Viksit Bharat as the leading fish producing country in the world.
- Environmental degradation in fish/shrimp production systems needs to be critically addressed through modifications in culture practices, development of carbon-neutral feed, regulated and monitored chemical/drug usage, etc.
- Marine fisheries management challenges like illegal, unreported and unregulated (IUU) fishing, effort regulations, bycatch and juvenile catch, regional conflicts and cross-border fishing, climate change impacts, anthropogenic interface with habitats need to be addressed immediately.
- India should tap the potential of sea weed cultivation, and develop nutraceuticals and therapeutics from aquatic plants and animals for animal and human use.
- Emphasis should be given on development of national brood bank, satellite hatcheries and nurseries to cater to future seed requirements of the country.

- Promotion of cluster approaches in farming, creation of value chains, and linking producers and buyers is the way forward. Funding opportunities for aquaculture are to be broadened and simplified.
- To promote natural farming a national level taskforce may be formed that would develop standard operating procedures, determine subsidy, etc.
- Northeast India should harness its vast potential of enhancing fish production and fishers' income through diversification of fish species, culture systems and use of feed resources in aquaculture, application of ecosystem-based fisheries management, enclosure culture in open-water resources, and harvesting the untapped potential of ornamental fish resources.
- Inland open waters fisheries address several SDGs. Robust policy framework to be prepared for judicious utilization of fish genetic resources, technological interventions and community engagement are critical for converting vulnerability into viability and sustainable open water fisheries and fishers' livelihood.
- Regulated water flow, pollution and over-fishing have stressed riverine fisheries. The country should come up with a national policy on riverine fisheries and biodiversity with inputs from scientific community. Dam construction authorities may seek opinion of fisheries experts during site selection and construction of the dams and barrages.
- ICAR-CIFRI has developed ranching protocols using wild-bred fish seeds for fisheries rejuvenation of River Ganga. The Institute should formulate National river ranching guideline to be applicable for other rivers towards restoration of riverine fisheries preventing risks of exotics introduction and germplasm contamination. Impact of river ranching may also be studied.
- Threats of nanoplastics and microplastics on habitat, food chain and fish health need thorough investigation.
- The country has adopted New Education Policy. Its implementation in the fisheries science need to be discussed. Fisheries education may be inter-disciplinary and demand-driven to meet future manpower requirements of the sector. Entrepreneurial skills may be incorporated in fisheries education.

- Women play great roles in fisheries and aquaculture. For women empowerment there is need for mainstreaming of gender studies in academics, dedicated fund for gender-specific research, and development of leadership and technical skills among women stakeholders.
- Recent tools such as AI, robotics, remote sensing, genomics, nanoscience etc. may be used more and more in real-time monitoring, habitat mapping and resource development planning, germplasm conservation, superior germplasm development, precision farming, reduce disease loss, developing climate resilience, etc.
- A National Legal framework and regulatory body needs to be set up to approve safe, effective chemicals & Veterinary Medicinal Products (VMPs) for aquaculture use in the country.
- A National Expert Group may be established to assess risk of exotic species introduction in the country and giving recommendations to the Government. There is an urgent need of proper plan and strategies for management of invasive fish species also.
- Developing knowledge and skill of fishers and fish farmers is critically important for sustainable production enhancement. To achieve this the country needs establishment of specialized training centres, such as Matsya Vikash Kendra, especially in coastal and important inland fisheries states.

Background

India is the 3rd largest fish producing country in the world with a total production of 17.4 mmt and endowed with a vast coastline spanning over 8,000 km, along with an extensive network of rivers, reservoirs, estuaries, lakes, tanks and ponds. Fisheries and aquaculture remain important sources of food, nutrition, and income, and the sector provides livelihood to over 28 million people, particularly in coastal and rural areas of the country and contributes substantially to foreign exchange earnings to the tune ₹63,969 crores through export of fish and related products. Moreover, fish is an affordable and vital source of protein and essential micronutrients addressing malnutrition challenges among the populace. In this context, it is imperative to ensure the long-term sustainability and resilience of fisheries resources amidst increasing pressures from overfishing, habitat degradation, anthropogenic interferences and climate change. Indian fisheries sector hasevolved gradually over the years and become an important tool for socio-economic upliftment for the nation. Conservation and sustainable use of diverse fisheries resources is a challenge in this era of global climate change. The scenario calls for scientific fraternity to discuss and direct Indian Fisheries and Aquaculture for attaining Sustainable Blue Economy.

Indian Fisheries and Aquaculture Forum (IFAF) is an illustrious event in Indian fisheries sector to realize and relook into recent developments and redefine the goals that would pave way for realistic achievements in the country. ICAR-Central Inland Fisheries Research Institute, Barrackpore, the Inland Fisheries Society of India, the Asian Fisheries Society Indian Branch and Professional Fisheries Graduates Forum (PFGF) jointly hosted the 13th Indian Fisheries and Aquaculture Forum (13thIFAF) during February 21-23, 2023 in Kolkata with the theme “Fostering growth of fisheries and aquaculture for sustainable development”.

About the Organizers

CIFRI is the first Institute established in India in the field of inland fisheries research, extension and training and is celebrating its 75 years of dedicated service to the nation. The Institute has an impressive track record of providing research and technology supports for the country's inland fisheries development since its inception in 1947. Technologies developed by the Institute have paved ways for aquaculture development and blue revolution, sustainable production

enhancement from reservoirs and wetlands, health management of rivers and associated ecosystems, fisheries resource assessment and database development, human resource development in inland fisheries, etc.

Inland Fisheries Society of India is one of the oldest scientific societies of India. The Society promotes fisheries research and development in Asia. It regularly organizes national and international scientific events and has the distinction of uninterrupted publication of Journal of the Inland Fisheries Society of India, a leading journal in the field of fisheries, since 1969.

Asian Fisheries Society Indian Branch (AFSIB), founded in 1986, has been successfully hosting Indian Fisheries and Aquaculture Forum in various parts of the country every three years since 1987. The Forum has established itself as a recognized platform for sharing fisheries knowledge through conferences, seminars, brainstorming, sessions, workshops and publications to bring current developments and issues in fisheries research, technology, development and policy into focus as well as recognizing merit through numerous awards and promoting young scientists over the past 35 years.

Professional Fisheries Graduates Forum (PFGF), a de facto national body of fisheries graduates of India, is registered in the office of Charity Commissioner, Mumbai under the Society Registration Act in 2002. The support extended by Dr. S. Ayyappan, the then DDG, ICAR along with whole-hearted guidance of eminent scientists like Dr. Panjab Singh, former DG, ICAR, Dr. H.P.C. Shetty, Dr. K.V. Devaraj, and Dr. J.V.H. Dixitulu has laid a strong foundation for the organization. The forum functions with its headquarters at ICAR-Central Institute of Fisheries Education, Mumbai, and has regional chapters in 12 states across the country.

The collective efforts of the organizers, including the AFSIB, ICAR-CIFRI, PFGF, and the Department of Fisheries, Government of West Bengal, have played a pivotal role in organizing 13th IFAF for supporting and promoting sustainable practices that seamlessly align with SDGs aspirations of the United Nations benefitting millions.

Themes, Special Symposia and Conclaves

Covering a wide range of topics including open water fisheries resource management, innovations in aquaculture, sustainable small-scale fisheries,

advances in fish nutrition, fish health management, post-harvest technology, value addition, emerging contaminants, precision farming, biotechnological interventions, fisheries extension governance, and policies, the conference aimed to highlight recent advances in the fisheries and aquaculture sector aligned with the sustainable development goals set by the United Nations. Scientific presentationsin 13 themed sessions with sub-themed sessions, 4 satellite symposia and 5 conclaves were organized under the Forum.

Theme 1: OFRM - Open water fisheries resource management

Subtheme I: Inland open water fisheries

Subtheme II: Marine capture fisheries management

Subtheme III: Food web dynamics and modelling

Theme 2: IAPG - Innovations in aquaculture production towards inclusive growth

Subtheme I: Advances in aquaculture production system

Subtheme II: Advances in breeding, seed production and rearing

Theme 3: SSFS - Small-scale fisheries addressing SDGs& Vulnerability to Viability (V2V) in fisheries

Theme 4: OMIC - OMICs approach in fisheries and aquaculture

Theme 5: AFNR - Advances in fish nutrition research, nutraceuticals, and nutrigenomics

Subtheme I: Advances in Fish Nutrition: Waste to wealth

Subtheme II: Frontiers in feed additives, nutraceuticals and feed management

Theme 6: FFHM - Frontiers in fish health management

Subtheme I: Fish disease emergence and surveillance

Subtheme II: Prophylaxis and fish health management

Theme 7: CRFA - Climate research in fisheries and aquaculture

Theme 8: IFPT - Innovations in fish harvest and post-harvest technology

Subtheme I: Advances in harvest technology and fish products

Subtheme II: Fish processing technology

Theme 9: AEHC - Aquatic ecosystem health and emerging contaminants

Subtheme I: Metal, plastic, and emerging contaminants

Subtheme II: Biological, and microbiological contaminants

Theme 10: PICT - Precision farming, ICT, sensors, GIS, robotics in fisheries

Theme 11: SOSF - Social science research in fisheries and aquaculture

Theme 12: MRSF - Mariculture and seaweed farming

Theme 13: FSFF - Frontiers in shellfish farming

Satellite Symposium: SSFG - Fish genetic resource and conservation

Satellite Symposium: SSRF - Riverine fisheries, habitat mapping and environmental health

Satellite Symposium: SSNE - Sustainable fisheries and aquaculture in North East India

Satellite Symposium: Natural Farming

Industry Conclave: Innovations in fisheries and aquaculture technologies

DoFs' Conclave: Developmental needs for enhancing farmers' income

Farmers' Conclave

Conclave on Women empowerment in fisheries

Students' Interface Conclave

PROCEEDINGS OF DIFFERENT SESSIONS

Inaugural Ceremony

The inaugural ceremony of the 13th IFAF was held on forenoon of 23rd February in Hall #1 of the Biswa Bangla Convention Centre, New Town, Kolkata. The prestigious conference was inaugurated by Hon'ble Parshottam Rupalaji, Minister of Fisheries, Animal Husbandry and Dairying, Government of India in the august presence of Dr. Himanshu Pathak, Secretary Department of Agricultural Research and Education (DARE) and Director General (DG), ICAR; Dr. Joykrushna Jena, Deputy Director General (Fisheries Science), ICAR; Dr. C. N. Ravishankar, Director& Vice Chancellor, ICAR-CIFE; and Dr. B. K. Das, Director, ICAR-CIFRI.

Dr. B.K. Das, the Director of ICAR-CIFRI and Convener of the 13th IFAF, began the conference by welcoming the distinguished dignitaries, honoured guests, and all attending delegates. He provided an overview of the extensive three-day program and emphasized that, beyond the scientific discussions centred on progress and future plans, the conference would also feature a range of engaging events. These included special lectures from industry experts, conclaves for fisheries officials and farmers, satellite symposia, student-focused sessions, and technology exhibitions. These events aimed to facilitate discourse on significant topics such as climate change, natural farming, gender equality, women empowerment, social advancement, and creating employment opportunities for young individuals in the fisheries sector.

Dr. A.K. Das, Secretary of the Inland Fishery Society of India (IFSI), took the floor next and offered a detailed overview of the organization, emphasizing its key role in supporting the advancement of inland fisheries. Then, Dr. C.N. Ravishankar, Director and Vice Chancellor of ICAR-CIFE and Vice Chairman of the event, discussed the pivotal role of the Asian Fisheries Society India Branch (AFSIB) in organizing the International Fisheries and Aquaculture Forum (IFAF) conference series. Through his remarks, he highlighted AFSIB's groundbreaking work in promoting collaboration and knowledge exchange within the fisheries community.

Dr. Joykrushna Jena, Deputy Director General (Fisheries Science) at ICAR and Patron of the 13th International Fisheries and Aquaculture Forum (IFAF), addressed the conference with insight and enthusiasm. In his speech, Dr. Jena emphasized the critical importance of pollution-free, sustainable, and profitable fisheries. He spoke passionately about the untapped potentials within the fisheries sector that, if harnessed effectively, could significantly contribute to the expansion and vitality of the national economy.

Dr. Jena encouraged the audience to recognize the vast opportunities for growth and innovation within the sector, which, when pursued thoughtfully, could yield tremendous benefits. He stressed the need for a balanced and equitable sharing of resources across different sectors of agriculture, promoting collaboration and synergy to enhance production. Dr. Jena also outlined a pragmatic roadmap for the amritkaal, or the golden era, which envisions a future where the fisheries sector flourishes through sustainable practices and strategic resource management. In closing, Dr. Jena's address resonated with a call to action for all stakeholders to work together to realize the full potential of fisheries, both as an industry and as a cornerstone of the nation's economic development. His

message underscored the importance of innovative approaches and strong collaboration to ensure a sustainable, prosperous future for the fisheries sector.

During the inaugural session of the conference, Honorable Parshottam Rupala, Minister of Fisheries, Animal Husbandry, and Dairying for the Government of India, called upon all stakeholders—including researchers, government officials, farmers, industry representatives, civil society organizations, and students—to align themselves with the nation's endeavors to boost production and ensure sustainability in the fisheries and aquaculture sector. He highlighted the critical role of this rapidly growing sector and emphasized the significant efforts being made to realize its full potential. Minister Rupala underscored the government's commitment to harnessing the opportunities within this "sunrise sector" through a multifaceted approach. This includes effective management practices, improving productivity, leveraging technological innovations, investing in infrastructure development, fortifying value chains, and implementing robust governance strategies. These initiatives are in line with the priorities outlined in the Prime Minister's Matsya Sampada Yojana (PMMSY), which aims to transform the fisheries sector and maximize its contribution to the nation's economy. The minister's address conveyed a sense of urgency and purpose, urging the audience to collaborate and embrace innovative strategies that will drive progress and sustainable growth in the fisheries and aquaculture industry. His remarks served as a rallying call for all stakeholders to play their part in the collective effort to achieve the sector's full potential and secure a thriving future for India's fisheries.

Shri Parshottam Rupala expressed his satisfaction with India's notable contribution to global fish production and its significant impact on the country's agricultural GDP. He highlighted the substantial foreign exchange earnings,

amounting to ₹63,969 crores annually, that India secures through the export of fish and fish-related products. The minister recognized these achievements as a testament to the sector's vitality and potential.

In his address, Minister Rupala offered several key pieces of advice aimed at further advancing the fisheries and aquaculture sector. He urged the community to focus on research and development efforts tailored to the needs of fishers, suggesting the formation of an apex forum for scientific communities to collaborate and innovate. He emphasized the importance of developing new technologies and infrastructure to minimize post-harvest losses, as well as promoting smart and digital marketing strategies with engaging slogans to increase the visibility of Indian fish products. The minister also recommended making use of 'Amrit Sarovars'—reservoirs for water conservation—for fish culture to enhance productivity. Additionally, he advocated for the establishment of Matsya Vikas Kendras (MVKs) across the country to support the sustainable development of the sector. Shri Rupala expressed hope that the conference would serve as a valuable platform for all stakeholders to come together and exchange ideas. By fostering dialogue and collaboration, the event could pave the way for the Indian fisheries and aquaculture sector to advance toward achieving key sustainable development goals, such as ensuring environmental sustainability, boosting economic growth, and promoting social inclusion. His optimistic outlook underscored the potential for transformative progress within the industry.

Dr. Himanshu Pathak, Secretary of the Department of Agricultural Research and Education (DARE) and Director General (DG) of ICAR, conveyed his aspiration for India to transition from being a "Vikas-sheel Bharat" to a "Viksit Bharat"—a

fully developed nation. He emphasized the critical role that the fisheries and aquaculture sector can play in achieving this national goal, particularly through its sustainable growth rate of 10%.

Dr. Pathak highlighted the importance of developing a fisheries sector that is nature-friendly, climate-resilient, and economically profitable. He underscored the need for introducing genetically improved species and adopting smart and precise practices to enhance productivity and sustainability. Additionally, he pointed out the necessity of establishing proper regulatory mechanisms to ensure responsible and ethical practices within the sector. Furthermore, Dr. Pathak stressed the importance of skill development as a means to empower individuals working in fisheries and aquaculture, thereby fostering innovation and efficiency. By equipping the workforce with the necessary knowledge and expertise, the sector can continue to grow and contribute significantly to the nation's overall development. In closing, Dr. Pathak's message reflected his commitment to guiding the fisheries and aquaculture sector toward a future that aligns with India's broader aspirations. His vision encompassed a sustainable, progressive, and profitable industry that can play a pivotal role in realizing the national dream of becoming a fully developed country.

At the event, several prestigious awards of national importance were presented by the Honorable minister, recognizing the outstanding contributions of individuals and organizations in the field of fisheries and aquaculture. These awards included the Prof. HPC Shetty Award, the Professors T. J. Pandian & A. J. Matty Award, the Dr. T.V.R. Pillai Award, the Dr. M. C. Nandeesha Award, and the Shri J.V.H. Dixitulu National Award, among others. Additionally, esteemed professionals were honored as IFSI Fellows, and promising young researchers received the AFSIB Young Scientist Awards. Awards were also presented to key industrial partners in acknowledgment of their valuable contributions to the sector. The recognition of these award-winning scientists and industry leaders serves as a source of inspiration for younger participants, encouraging them to pursue excellence and set new benchmarks for the development of the fisheries and aquaculture sector.

During the inaugural ceremony, the Honourable minister also unveiled two innovative products developed by ICAR-CIFRI: CIFRI-AlgaS^{+} and CIFRI Aqua Promo. These products represent significant advancements in the field and hold

the potential to greatly benefit the industry. In addition to the product launches, various publications were released, including the Souvenir of the 13th IFAF, the Book of Abstracts, River Ranching Guidelines, Inland Fisheries Development in Mayurbhanj, Success Stories: Wetlands of Bihar, Catalogue of Genus Mystus in India, and Open Water Fisheries Development in Northeast India. Moreover, two industry partners, MR Aquatech from Bhubaneswar and Glaucus Agrochem Pvt. Ltd. from Kolkata, were honoured for their contributions and collaborations in the sector.

Dr. K. M. Rajesh, Secretary of AFSIB, concluded the event by proposing a formal vote of thanks, expressing gratitude to all those who made the conference a success. The event drew approximately 1,500 delegates from India and abroad, including a distinguished gathering of scientists, entrepreneurs—particularly women entrepreneurs—fishers and fish farmers, research scholars, government officials, industrialists, and students. This diverse attendance underscored the broad interest and investment in the advancement of the fisheries and aquaculture sector.

Session on Keynote Address & Memorial Lectures

The keynote address and memorial lecture session was held in Hall #1 shortly after the inaugural session, presided over by Dr. Dilip Kumar, Former Director of ICAR-CIFE, Mumbai, and Dr. (Mrs.) B. Meena Kumari, Former Deputy Director General (Fisheries Science) of ICAR, New Delhi. The keynote address, titled "Fisheries Higher Education for Viksit Bharat," was delivered by Dr. C. N. Ravishankar, Director of ICAR-CIFE, Mumbai.

In his address, Dr. Ravishankar provided an overview of the evolution of fisheries higher education in India, starting with the establishment of the first Fisheries College in Mangalore in 1969. He noted that there are currently 36 fisheries colleges across the country, with ICAR-CIFE in Mumbai becoming India's first Fisheries University in 1989. He emphasized the critical role of these institutions in fostering skilled professionals for the fisheries sector and highlighted the significant contribution of ICAR-CIFE to 8.9% of professional human resource development in fisheries in India.

Dr. Ravishankar presented projections for the demand for fisheries professionals by 2025, underscoring the need for trained individuals to meet the growing needs

of various fisheries sub-sectors. He also discussed the impact of the National Education Policy (NEP) on fisheries education in India, noting the potential benefits and challenges of implementing the NEP within the sector. In his remarks, Dr. Ravishankar emphasized the necessity of establishing and strengthening fisheries polytechnics (with plans for 10 to 12 institutions) and introducing vocational fisheries education at the school level. He advocated for integrated, interdisciplinary, and demand-driven education programs that align with the needs of the industry and the country. Dr. Ravishankar also highlighted the importance of adopting innovative, next-generation teaching methodologies that support initiatives such as Skill India and Digital India. His speech concluded with a call to action for the audience to embrace these changes and strive for excellence in fisheries higher education, ultimately contributing to India's progress toward becoming a "Viksit Bharat.".

Dr. J.K. Jena, Deputy Director General (Fisheries Science) of ICAR in New Delhi, delivered the Dr. V.R.P. Sinha Memorial Lecture on the topic "Aquaculture Development in India: R&D Perspectives for Attaining SDGs." In his lecture, Dr. Jena explored the critical role of fish as a nutrient-rich food source and the changing patterns in fish consumption. He provided an overview of key aspects of Indian fisheries and aquaculture, examining fish production trends over the years and the rise of entrepreneurship within the sector.

Dr. Jena discussed the significant potential of aquaculture in India, noting its promising past and bright future. He stressed the importance of diversifying aquaculture systems and species, as well as improving the quality of fish seed production. He also highlighted the recent development of hatchery technologies for over 15 species of brackish water and marine finfish by ICAR-CMFRI, along with the successful enclosure culture in inland open waters by ICAR-CIFRI. He spoke about the growing opportunities for entrepreneurship development,

particularly in trout farming in upland areas. The lecture touched upon recent advances in brackish water aquaculture, including shrimp farming, and new farming methods such as recirculating aquaculture systems (RAS) and biofloc-based culture systems that are particularly suitable for urban and peri-urban areas. Dr. Jena emphasized that ornamental fish farming offers an opportunity that is not constrained by scale, presenting potential for a range of entrepreneurs.

Dr. Jena underscored the need for genetic improvement of fish and shellfish through selective breeding to enhance aquaculture productivity and resilience. He also discussed recent developments in aquatic animal disease surveillance and de novo whole-genome sequencing of species of aquacultural interest. The lecture concluded with a discussion of the major challenges faced by the Indian fisheries and aquaculture sector. These include aquatic animal diseases (both endemic and transboundary), water quality and quantity issues, climate change, conservation of natural resources (land and water), inter-sectoral competition for resources, the need to reduce input costs, antimicrobial resistance, market volatility, quality of fish seeds (hybrids and backcrosses), the development of diversified and new farming systems (including new species), and the introduction of exotics. Dr. Jena stressed the importance of collaboration, cooperation, communication, and convergence in addressing these challenges and moving the sector forward. His comprehensive lecture offered a roadmap for stakeholders to navigate the future of aquaculture in India and contribute to the achievement of the United Nations Sustainable Development Goals (SDGs).

Dr. V.R.P. Sinha Memorial Lecture on “Aquaculture development in India: R&D perspectives for attaining SDGs” was delivered by Dr. J. K. Jena, DDG (Fy. Sc.), ICAR, New Delhi. Dr. Jena discussed the role of fish as a rich nutrient source, changes in fish consumption pattern, salient aspects of Indian fisheries and aquaculture, fish production trends over the years, growing entrepreneurship in fisheries, sustainable development goals (SDGs), targets for fish production by 2025 and 2047 as well as the shift in goals for the fisheries sectors since 1950s. He stated that aquaculture has a glorious past and future potential in India and stressed on need for diversion of aquaculture systems and species, quality fish seed production, etc. He also discussed recent developments of hatchery technologies for more than 15 brackish water and marine fin-fishes by ICAR-CMFRI, enclosure culture in inland open-waters by ICAR-CIFRI, and new avenue of entrepreneurship development in trout farming in uplands. Dr. Jena discussed advances in brackish water aquaculture (including shrimp farming),

new farming systems like RAS and biofloc-based culture systems that have potentials in urban/ peri-urban areas. He mentioned that ornamental fish farming is a scale-neutral avenue. He stressed on need for genetic improvement of fish and shell-fishes, including selective breeding, for aquaculture. He also dwelt on aquatic animal disease surveillance carried out in recent years, de-novo whole-genome sequencing of aquaculture interest. He underscored the following major issues/ challenges in the Indian fisheries and aquaculture: aquatic animal diseases (both endemic and trans-boundary), water quantity and quality, climate change, conservation of natural resources (both land and water), inter-sectoral competition for resources, need to reduce the cost of inputs, anti-microbial resistance, market volatility, quality of fish seeds (hybrids/ back-cross), diversified and new farming systems (including new species)and introduction of exotics. Lastly, he stressed on the need for collaboration, cooperation, communication and convergence.

Dr. K. Riji John, Former Vice Chancellor of KUFOS, Kochi, delivered the Dr. S.D. Tripathy Memorial Lecture on the topic "Viral Diseases in Aquaculture – Indian Perspective." In his lecture, Dr. John emphasized the increasing economic impact of fish diseases in India, particularly viral diseases, and discussed the various factors contributing to the incidence of these diseases. He explored the complex interplay of abiotic factors, such as water temperature and quality, and biotic factors, including pathogens and the health status of aquatic animals, that can influence the occurrence and spread of diseases in aquaculture. Dr. John identified risk factors for disease incidence and discussed the etiological agents responsible for fish diseases, including the viruses associated with Epizootic Ulcerative Syndrome (EUS) and other aquatic animal diseases.

Dr. John provided insights into the development of cell lines for virological studies, which allow researchers to study viruses and their effects on host cells in a controlled environment. He also discussed the process of cell culture transformation and advances in disease diagnostics, including new technologies for identifying pathogens and understanding disease mechanisms. Improved

control measures, such as the use of probiotics and bioremediation, were highlighted as important strategies for managing diseases and enhancing the health of aquaculture systems. Dr. John shared recent developments in vaccine research against viral pathogens and anti-viral therapies that hold promise for controlling viral diseases in aquaculture. In addition, Dr. John discussed genetic selection and breeding for disease resistance, which can improve the resilience of aquaculture species to viral infections. He mentioned the importance of molecular epidemiology in understanding the distribution and transmission of viruses, which can aid in developing effective control measures. The lecture also touched upon microbiome-based approaches for enhancing the health of aquaculture systems and reducing disease risks.

Dr. John concluded his lecture by addressing the potential impact of climate change on the spread and severity of viral diseases in aquaculture. He noted that changes in temperature and other environmental conditions could affect the behavior and distribution of pathogens, as well as the susceptibility of fish and other aquatic animals to disease. Dr. John's lecture provided a comprehensive overview of the challenges posed by viral diseases in Indian aquaculture and offered potential strategies for managing and mitigating these risks. His insights into recent research and advances in the field provided valuable information for stakeholders aiming to safeguard the health and productivity of aquaculture systems.

Dr. V.V. Sugunan, Former ADG (Inland Fisheries) at ICAR, delivered the Dr. B.C. Jha Memorial Lecture on the topic "Inland Fisheries Management—Challenges and Opportunities." In his comprehensive lecture, Dr. Sugunan discussed the complexities of managing inland fisheries in India and the potential for developing open water bodies in a sustainable and equitable manner. He provided an in-depth analysis of the available resources and production systems in inland waters, drawing on relevant case studies from across the country to illustrate his points.

Dr. Sugunan emphasized the importance of implementing an integrated inland water management regime, which is crucial for planning and executing water resource development projects that take into account all tangible and intangible benefits of aquatic resources. This holistic approach would allow for the sustainable development of inland water bodies while balancing the various demands and benefits that these resources provide. He also stressed the need to recognize the significance of inland waters and the ecosystem services they offer. These services include supporting biodiversity, providing habitats for aquatic life, offering recreational opportunities, and sustaining local communities that depend on these resources for their livelihoods. Dr. Sugunan cautioned against focusing solely on increasing fish production through aquaculture at the expense of the traditional fisheries that thrive in rivers and other inland waters.

By highlighting the importance of equitable management and conservation of inland fisheries, Dr. Sugunan underscored the necessity of protecting the interests of fishers who rely on open waters for their income and sustenance. He urged stakeholders to strike a balance between enhancing aquaculture production and preserving the livelihoods of traditional fishers. Dr. Sugunan's lecture concluded with a call to action for policymakers, researchers, and practitioners to adopt an integrated, inclusive, and sustainable approach to managing inland fisheries. This would help ensure the continued provision of ecosystem services, support the livelihoods of local communities, and promote the responsible use of inland water resources for the benefit of current and future generations.

In his closing remarks, Dr. Dilip Kumar, Former Director of ICAR-CIFE in Mumbai and one of the session's Chairpersons, emphasized the importance of fostering effective coordination between research and development agencies in aquaculture. Such coordination would enable the sector to address the major challenges and leverage emerging opportunities more efficiently.

Dr. (Mrs.) B. Meena Kumari, Former Deputy Director General (Fisheries Science) of ICAR in New Delhi and also a chairperson of the session, stressed the necessity of conserving and maintaining aquatic resources. She highlighted the importance of ensuring a steady supply of inputs essential for the sustainable development of aquaculture.

The session's major recommendations centred around the need for focused and collaborative efforts from R&D agencies to tackle key challenges in the Indian fisheries and aquaculture sector. These challenges include:

- **Cost Reduction:** Lowering the cost of inputs in aquaculture to make it more economically viable and accessible for fishers and farmers.
- **Disease Management:** Addressing the containment and control of aquatic animal diseases to maintain healthy stocks and sustain production.
- **Resource Management:** Preserving water quality and quantity, as well as reducing inter-sectoral competition for resources to ensure sustainable use.
- **Market Stability:** Addressing market volatility to protect producers from economic risks and improve profitability.
- **Quality Enhancement:** Improving the quality of fish seed and other essential resources to boost productivity and efficiency.
- **Educational Development:** Providing integrated and demand-driven education and skill development programs to cultivate a skilled workforce capable of advancing the sector.

These recommendations point toward a holistic approach that integrates scientific research, practical applications, and educational initiatives. This combination would enable the Indian fisheries and aquaculture sector to overcome existing challenges and drive sustainable growth, ultimately contributing to the country's economic and social development.

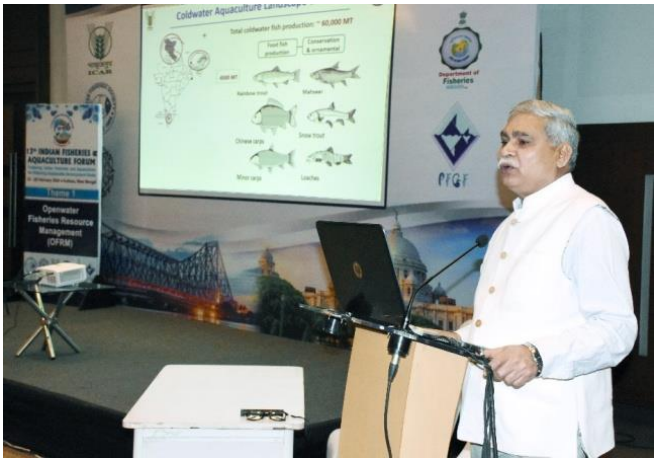
Theme-wise Oral Sessions

Theme 1: Openwater fisheries resource management (OFRM)

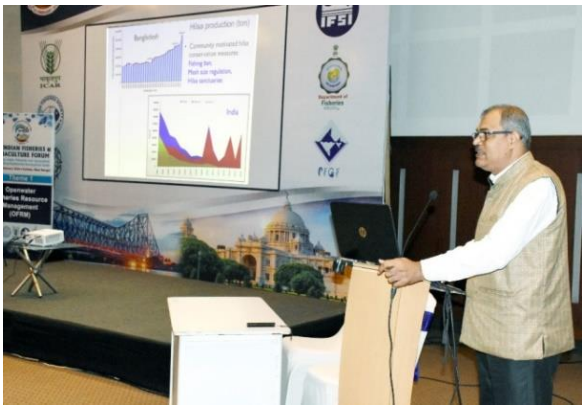
SubthemeI: Inland open water fisheries

The session chaired by Dr. S. Damroy, Former Director of CIARI in Port Blair, and Dr. P.K. Pandey, Director of ICAR-DCFR in Bhimtal, began with a lead lecture by Dr. A.K. Singh, Former Director of ICAR-DCFR in Bhimtal. Dr. Singh's presentation focused on management strategies for non-native invasive fish species (NIFS) in inland waters. Dr. Singh outlined the significance of inland fisheries for India and emphasized the growing challenges posed by invasive fish species. He highlighted the importance of identifying and monitoring invasive species in order to mitigate their impact on native ecosystems and species. The talk addressed the role of inefficient regulatory bodies in managing these challenges and proposed various effective management plans. These plans include species-specific strategies for managing particular invasive species such as tilapia, Pangasius, and Litopenaeus vannamei, which have become prevalent in certain inland waters. Dr. Singh also suggested the development of biogenetic control measures as a means of managing the spread and impact of invasive species. The lecture stressed the necessity of adopting monitoring and research approaches tailored to NIFS, utilizing modern tools and methodologies. For example, he advocated for the use of Geographic Information System (GIS)-based databases and genetic tools to track and study the distribution and impact of invasive species. These advanced approaches would contribute to more effective and sustainable long-term management of NIFS. Dr. Singh's talk provided valuable insights into the management of non-native invasive fish species in India's inland waters. By focusing on identification, monitoring, and targeted strategies, he offered potential solutions to help protect native species and ecosystems from the negative effects of invasive species. His emphasis on advanced tools and adaptive management approaches underscored the need for a proactive and scientific approach to tackling the issue.

Dr. P. K. Pandey delivered another lead lecture highlighting potentials, issues, challenges and strategies for development of coldwater fisheries in country. He highlighted various coldwater resources of the country, their fish diversity and production, current status of capture fisheries scenario, and how the resources are important for local fishers. He informed that current hill region reservoir fish production is around 27 to 149 kg/ha and mainly supports recreational and subsistence fisheries. Aquaculture sector is the only way to increase per area fish production and ways to enhance the production through intensive culture in raceways: rainbow trout has a potential to produce 40-50 kg biomass/m^3in high-intensity recirculatory system developed by the institute.



Dr Vindhya Mohindra, Principal Scientist and Head, ICAR-NBFGR Lucknow talked on 'Conservation genetics and genomics for sustainable open-water fisheries', and stressed that identification of changing species diversity in the country has an important role to play in monitoring anthropogenic ecological changes. Conservation should be sustainable. Different omics, genome skimming and similar advanced methods are used in monitoring genetic diversity, differentiating closely related genetic stocks, new species description, resolving taxonomic ambiguities, etc.



The lead lectures were followed by seven oral presentations which covered a wide range of areas like fish species diversity, assessment of environmental and fisheries status, impact assessment of invasive species, spatio-temporal changes in fish

catch. The session ended by hot topic of current status of Hilsa culture in India and various initiatives taken by ICAR-CIFRI for breeding in controlled environment and developing standardized culture practice.

Chairs appreciated the lead talks covering various open-water resources and expressed happiness that all the presentations were good, relevant to the current times catering to different stakeholders' requirement. The session recommendations were that there is an urgent need to have proper plan and strategies for management of invasive fish species; development of suitable protocols; use of modern tools and techniques for assessment of fish biodiversity and conservation in inland-open waters in the face of shrinking inland water resources and climate change. The session rapporteurs were Dr. Niti Sharma, Scientist, ICAR-CIFRI and Dr. Manas H. M., Scientist, ICAR-CMFRI.

Subtheme II: Marine capture fisheries management

The session on "Marine capture fisheries management" was chaired by Dr. Maniranjan Sinha, Former Director, ICAR-CIFRI, Barrackpore, and Dr. S.K. Chakraborty, Former Head, ICAR-CIFE, Mumbai. There were three lead speakers in the session. Dr. Dineshbabu A. P., Head and Principal Scientist, ICAR-CMFRI, presented demand-driven changes in trawl catch and bycatch in India: suggestions for trawl bycatch mitigation in the changed scenario. Dr. Babu gave a detailed account of recent changes in trawl fisheries in India. He highlighted selectivity of trawlers based on minimum legal size, changes in speed, mitigation of bycatch, and strong enforcement of regulations and recommended vessel monitoring, strict implementation of minimum legal-size enforcement, GIS mapping etc. He further emphasized the importance of developing juvenile avoidance methodologies for conduct mapping and the mapping of juvenile grounds using

GIS technology. He concluded that the present Indian trawl fishery is an environmentally conscious livelihood earner for millions.

Dr. Shoba Joe Kizhakudan, Head and Principal Scientist at ICAR-CMFRI, delivered the second lead lecture on the status of finfish resources and their potential in Indian marine waters. She provided an overview of the significant potential yield from the Indian Exclusive Economic Zone (EEZ), estimated at 7.16 million metric tons in 2018. This substantial potential highlights the importance of effective and sustainable management of marine fisheries. Dr. Kizhakudan emphasized the principles of marine fisheries management, focusing on the need for accurate data to inform decisions. She explained the methodologies used to assess stocks, including length-based methods and stock recruitment spawning stock biomass analyses. By tracking and evaluating the health of various species, management strategies can be tailored to ensure the long-term sustainability of marine resources. Existing regulations governing marine fisheries in India were discussed, along with challenges faced in conservation and management. Dr. Kizhakudan pointed out that while there are regulatory frameworks in place, policy enforcement and compliance remain multifaceted issues in the country, requiring more focused attention. The lecture concluded with an examination of key fisheries management challenges, such as illegal, unreported, and unregulated (IUU) fishing, which has significant impacts on fish stocks and ecosystems. Additionally, she highlighted the importance of regulating fishing efforts, minimizing bycatch and juvenile catch, and managing conflicts among local fishing communities. Regional disputes, cross-border fishing issues, and the broader impacts of climate change also present ongoing challenges. Furthermore, she discussed anthropogenic factors affecting marine habitats, such as habitat degradation, and the need for greater transparency in sourcing information to support effective management practices. Overall, Dr. Kizhakudan's lecture underscored the need for a data-driven, collaborative approach to address the complex challenges facing India's marine fisheries, aiming for sustainable and equitable development.

Dr. P. Pravin, Former ADG (Marine Fisheries) at ICAR, delivered a presentation on "Fish Harvest Technology: Status and Way Forward," providing an overview of the current state of fishing gear and crafts as well as the challenges facing post-harvest technologies. He highlighted the wide variety of fishing crafts and gears used in India's inland and marine sectors, pointing to their diversity and adaptability. Dr. Pravin addressed significant challenges facing fish harvest technologies, such as overfishing, habitat loss, and the effects of climate change on marine ecosystems. He underscored the need for a balanced approach to fishing, noting that the current fleet size should be halved to achieve optimum sustainability. He also highlighted the negative impact of certain fishing gears on bycatch, emphasizing the importance of responsible fishing practices. Creating awareness and promoting the impacts of the drivers of marine fisheries were key points in Dr. Pravin's talk. He stressed the need for educating stakeholders and the public about sustainable practices to preserve marine resources for future generations. By raising awareness, communities can better understand the importance of sustainable fishing and adopt practices that minimize harm to marine ecosystems. Dr. Pravin also discussed emerging technologies such as artificial intelligence (AI), robotics, and Geographic Information System (GIS) technology as potential tools to enhance fish harvest technology. These advancements offer promising opportunities for improving efficiency, reducing bycatch, and better managing fisheries. He concluded by advocating for a robust policy framework, continued technological innovation, and active community engagement to ensure sustainable management of marine fisheries. Through collaboration and ongoing efforts in these areas, Dr. Pravin

believes that the marine fisheries sector can overcome its current challenges and move toward a more sustainable and productive future.

There were five oral presentations in the session, encompassing different marine fisheries such as spider prawn fishery, cephalopod fisheries, croaker fisheries, and reef fisheries. The chairs thanked and complimented all the lead speakers and paper presenters. The proceedings were recorded by Dr. Shymal C.S. Das, Scientist, ICAR-CIFRI and Dr. Debabrata Panda, Scientist, ICAR-CIFA. The session ended with vote of thanks proposed by Dr. Dibakar Bhakta, Scientist, ICAR-CIFRI.

Subtheme III: Food web dynamics and modelling

The session, chaired by Dr. E. Vivekanandan, Former Head of ICAR-CMFRI, and Dr. Sudhir Kumar Das, Professor at WBUAFS, featured two lead lectures offering insights into ecosystem modeling and its application in managing aquatic ecosystems. Dr. Vivekanandan provided an introduction to the principles and importance of ecosystem modeling. He discussed how this modeling approach can be utilized to evaluate the current status of aquatic ecosystems, forecast potential changes, and inform management strategies to maintain ecological balance and sustainable use of resources.

Dr. Preetha Panikkar, Principal Scientist at ICAR-CIFRI in Bangalore, followed with a presentation showcasing the successful application of the ECOPATH model in managing various water bodies. She highlighted how the ECOPATH model had been effectively employed to manage reservoirs such as Kelavarathi, Hemavathi, Ravishankar, and Karapuzha, as well as several wetlands. Dr. Panikkar's lecture illustrated the practical benefits of using the ECOPATH model in understanding the complex interactions within aquatic ecosystems. The model's application helps identify potential issues such as overfishing or habitat degradation and provides insight into the most effective management measures. By analyzing how different species and environmental factors interact, the model aids in creating tailored strategies for specific water bodies. The lectures demonstrated the value of ecosystem modeling in the sustainable management of aquatic resources. It underscored how combining scientific approaches, such as the ECOPATH model, with an in-depth understanding of local contexts, can provide actionable insights for preserving aquatic environments and supporting the livelihoods dependent on them. Through continued research and application of these models, management practices can be refined to maintain healthy and productive ecosystems.

The lead paper presentations were followed by 8 oral paper presentations on topics of inland open water fisheries, which covered a wide range of areas like plankton, biology, modelling, murrel cage culture, and management of exotic fish. The chairs appreciated all the participants.

The session on ecosystem modeling and management of aquatic ecosystems produced several key recommendations that could inform future research and conservation efforts in marine and coastal environments. The session rapporteurs, Dr. Jeetendra Kumar from ICAR-CIFRI and Dr. Subal Kumar Roul from ICAR-CMFRI, provided a summary of the discussions and proposed the following recommendations:

1. **Focused Studies on Micro-phytoplankton:** Recognizing the importance of micro-phytoplankton in supporting marine and coastal

ecosystems, the session emphasized the need for more in-depth studies on their size and composition in coastal waters. Understanding these foundational organisms is crucial for maintaining the health and productivity of marine food webs.

2. **Habitat Mapping for Conservation:** The session highlighted the urgency of studying habitat mapping to conserve and manage critically endangered species. Accurate habitat mapping can identify areas of ecological significance, enabling targeted conservation efforts and the protection of vulnerable species and their habitats.
3. **Validation of Ecosystem Models:** The session stressed the importance of validating ecosystem models to ensure their accuracy and reliability in predicting changes and guiding management decisions. By confirming the effectiveness of these models, researchers and policymakers can use them more confidently to inform strategies for sustainable management of marine and coastal ecosystems.

Theme 2: Innovation in aquaculture production towards inclusive growth (IAPG)

Subtheme I: Advances in aquaculture production system

The session chaired by Prof. H. Shivananda Murthy, Dean of Neotia University in Kolkata, and Dr. Mrityunjoy Kunda, Professor and Head of the Department of Aquatic Resource Management at Sylhet Agricultural University in Bangladesh, included three lead talks that covered various aspects of aquaculture. The speakers provided insights into changes in aquaculture over the past decade, innovations in fish waste recycling, and new perspectives on freshwater fish breeding and culture.

Dr. Debajit Sharma, Head of Department at ICAR-CIFE, presented a talk on the decadal changes in the global and Indian aquaculture scenario. He highlighted the significant role of species diversification in increasing aquaculture production.

This diversification can help meet the growing demand for fish and seafood products while also contributing to more sustainable and resilient aquaculture systems.

Dr. D.K. De from ICAR-CIBA discussed the recycling of fish waste for a clean India, focusing on hydrolysis techniques. He explained how hydrolysis converts fish waste into a useful product that can be used as a plankton booster, instead of causing nuisance odors in fish markets. The recycled product can also be used as a feed ingredient, a fertilizer, and for biofortification in agriculture, supporting zero-waste fish culture practices.

Dr. P. Routray, Principal Scientist at ICAR-CIFA, presented on new vistas in freshwater fish breeding and culture. He reported that around 56 million total fish seeds were produced in 2022, with many states becoming self-reliant in seed production. Dr. Routray emphasized the importance of focusing on the quality of fish seed rather than just quantity, as quality seeds can lead to more successful and sustainable aquaculture operations. He described the progressive evolution in fish seed production, transitioning from pituitary extract to synthetic hormones and hatcheries. India now boasts around 3,000 hatcheries, facilitating year-round seed production and the potential for cryopreservation to ensure year-round availability of fish seeds. The lectures underscored the advancements and emerging trends in the aquaculture sector, particularly in species diversification, waste recycling, and improved breeding techniques. These innovations contribute to a more sustainable and efficient aquaculture industry that supports both economic growth and environmental stewardship.

There were nine oral presentations in the session encompassing different areas of aquaculture such as growth performance of stinging catfish, captive broodstock of tade mullet, growth and survival of IMC in cattle wastewater, biofouling mitigation of cage nets, minor carp-based polyculture in mid-hills of Uttarakhand, growth and survival of Pacu in different culture methods, growth performance of IMC in biofloc system, pen culture in beels as a livelihood option. Dr. H.S. Swain, ICAR-CIFA and Dr. Pushpa Choudhury, ICAR-CIFA acted as rapporteurs in the session.

Subtheme II: Advances in breeding, seed production & rearing

The session chaired by Dr. Pratap Chandra Das from ICAR-CIFA and Dr. Koushik Ghosh from Burdwan University featured two lead lectures followed by oral presentations that explored advances in both freshwater and brackishwater aquaculture.

Dr. P.C. Das presented on innovations in freshwater aquaculture, focusing on various aspects such as seed production, fry and fingerling rearing, and the dissemination of effective technology for scientific fish farming. He discussed resource renovation and horizontal expansion strategies, which involve making better use of available resources to expand aquaculture areas. Additionally, Dr. Das emphasized the potential for vertical increase in productivity through species and system diversification, as well as changes in cropping patterns. Another key point of Dr. Das's lecture was the importance of breed improvement and the use of non-conventional feed ingredients to enhance productivity and sustainability. He also highlighted the need for robust disease control and management practices. Moreover, he mentioned the role of artificial intelligence (AI) and machine learning (ML) in moving towards precision aquaculture, which can help optimize production and minimize waste.

Dr. M. Kailasam, Head of ICAR-CIBA, presented on the significant growth of the brackishwater aquaculture sector. He explained how this sector has transformed from traditional farming to controlled, scientific farming practices, which has enabled it to earn substantial foreign exchange through export. Dr. Kailasam highlighted the importance of support from research institutions and private entrepreneurs in the recent growth of brackishwater aquaculture. Their collaboration has led to the establishment of hatcheries, feed mills, and disease diagnostic centers, facilitating the production and management processes. This level of support has been instrumental in the sector's development and the ability to meet international market demands. The two lectures provided insights into the transformative innovations and growth occurring within the aquaculture industry. It emphasized the role of research, technology adoption, and collaboration between different stakeholders in advancing the industry, both in terms of sustainability and economic success.

In the oral presentations, Dr. Ajit Chaudhari presented study on comparative growth of fingerlings of *Labeo rohita* under conventional and aquamimicry systems which revealed that aquamimicry system could be an alternative to the existing conventional carp seed rearing method. Dr. G. Biswas presented ultrasonography technology and its application to determine sex and maturity stages accurately without causing physical injury and stress, especially to delicate and high-value fish species like *Tenualosa ilisha*. Dr. Harsha Haridas presented the effect of the inclusion of biofloc at different levels

in the diet and growth performance and physio-metabolic responses of *Mugil cephalus*. Dr. Prem Kumar opined that 0-5 ppt is the optimal salinity for breeding and larval rearing of *Etroplus maculatus*. Dr. S. N. Sethi described induced breeding and seed production of organically grown Indian Major Carp (IMC) using a single dose of Pituitary Gland Extract (PGE) - the holistic approach ensures health and well-being of the fish, and contribute to long-term environmental resilience.

Dr. M. S. Akhtar presented paper on year-round production of golden mahseer seeds representing a substantial advancement in ex-situ as well as *in situ* conservation endeavors of the valuable fish. Dr. Shivendra Kumar presented paper on survival and growth of *Heteropneustes fossilis* and *Anabas testudineus* in monoculture and co-culture system in biofloc. Co-culture proved more profitable than monoculture enhancing farmers' income. Dr. T. I. Chanu highlighted utilization of algal oil in the diet of *Channa striata* fingerlings by completely replacing fish oil without any detrimental effect. Work of Dr. Pankaj Kumar Tiwari showed water hardness up to 200 mg/l as $CaCO_3$ can be recommended for optimal fertilization, hatching, high viability, and maximum larval development of *Anabas testudineus*. Dr. Rajesh Kumar presented paper on involvement of the stakeholders in murrel seed production and farming making good profit: about 1200-1500 acres of area has been brought under murrel monoculture through awareness and knowledge generation on seed production and grow-out culture of *Channa striata*. Dr. Ramya V.L., ICAR-CIFRI and Dr. Abhiman, CoF, Kishanganj acted as rapporteurs in the session.

Theme 3: Small scale fisheries addressing SDGs and vulnerability to Viability (V2V) in Fisheries (SSFS)

The session, chaired by Dr. Prateep Nayak from Waterloo University in Canada and Dr. Binoy Kumar Chakraborty from Bangladesh, focused on small-scale fisheries and included a lead talk by Dr. Prateep Nayak, followed by Dr. M. A. Hassan's presentation on fisheries enhancement programs in oxbow lakes of Bihar. Dr. Nayak's talk emphasized the vulnerability-to-viability (V2V) approach for sustainable small-scale fisheries, considering social, political, and ecological vulnerabilities as essential factors in understanding the challenges faced by these systems.

Dr. Hassan's presentation highlighted ICAR-CIFRI's intervention in increasing fish production from wetlands in Bihar, which has contributed to enhancing the livelihood status of wetland fishers. Through successful implementation of fisheries enhancement programs, ICAR-CIFRI has positively impacted both fish production and local communities' livelihoods.

The session featured nine informative presentations on various aspects of small-scale fisheries, showcasing diverse experiences and challenges across India. The topics covered a wide range of subjects, including the culture of freshwater ornamental fishes in Gurupura estuary in Karnataka, which promotes livelihood security for fish farmers, and the sustainability of pole and line tuna fisheries in Lakshadweep, emphasizing traditional fishing methods. Other presentations highlighted the breeding performance of small prawns in the river Gomti, important for biodiversity and local economies; short-arm octopus fisheries on the Palk Bay coast, offering insights into a lesser-

known aspect of coastal fisheries; and the transition from vulnerability to viability in small-scale fisheries in the Indian Sundarbans, a complex and ecologically rich area. Additionally, the session explored small-scale fisheries in Duma wetland, examining unique ecological and cultural aspects of the region, and discussed signals and critical reflections of COP 28 on small-scale fisheries, addressing potential impacts on policy and practice. Lastly, the session covered environmental concerns and economic uncertainties in Chilika Lake's small-scale fisheries, focusing on conservation and sustainable management challenges.

Discussions in the session centred on major thrust areas such as the vulnerability-to-viability (V2V) approach, small-scale bivalve and gastropod fisheries, artisanal fisheries, indigenous freshwater fish culture for sustainable trade, and adaptive strategies for comprehensive development of small-scale fisheries. These topics highlighted the need for sustainable enhancement and livelihood improvement of the fishing community. Dr. Piyashi Debroy and Dr. Jesna P.K., scientists from ICAR-CIFRI, acted as rapporteurs in the session, summarizing and capturing key takeaways from the discussions, providing valuable insights for future research and policy-making in the field of small-scale fisheries.

Theme 4: OMICs approach in fisheries and aquaculture

The omics approach in fisheries and aquaculture session at the 13th IFAF was chaired by Dr. B.P. Mohanty, ADG (Inland Fisheries), ICAR, New Delhi, and Dr. Gopal Krishna, former Director of CIFE, Mumbai. The session featured lead speakers who discussed various omics techniques and their applications in fisheries and aquaculture.

Dr. B.P. Mohanty emphasized the impact of arsenicosis, a condition caused by arsenic exposure, on suppressing immunity in aquatic species. He introduced the innovative use of nano-formulated curcumin as a potential method to delay the clinical onset of arsenicosis. Additionally, Dr. Mohanty discussed the possibility of utilizing different forms of apolipoprotein as biomarkers for the early detection of arsenicosis.

Dr. B.K. Behera, Dean of RLBCAU in Jhansi, highlighted the importance of metagenomics in monitoring the health of aquatic ecosystems, particularly rivers. Metagenomics, a technique that examines the genetic material of entire communities in an ecosystem, can provide insights into the diversity and stability of aquatic environments.

Dr. J.K. Sundaray, Principal Scientist at ICAR-CIFA in Bhubaneswar, discussed the application of omics approaches in fisheries and aquaculture, emphasizing the use of metagenomics in the genetic selection of high-value aquaculture species. This approach can lead to the development of robust and high-performing aquatic species for commercial purposes.

Dr. K.S. Sobhana, Principal Scientist at ICAR-CMFRI in Kochi, highlighted the significance of marine viromics in monitoring marine ecology amid climate change. Viromics, the study of viral communities within an ecosystem, can provide valuable data on the health and stability of marine environments and their ability to adapt to changing conditions.

Dr. M. Goswami, Principal Scientist and Head of CIFE in Mumbai, shared his insights on the application of multiomics in aquaculture and fisheries. Multiomics integrates various omics disciplines such as genomics, transcriptomics, proteomics, and metabolomics to offer a holistic view of the biological processes within aquatic species and their environments. The lead lectures emphasized the importance of advanced omics techniques in understanding and managing the complex interactions within aquatic ecosystems, with potential applications in genetic selection, disease detection, and ecological monitoring

The lead presentations were followed by 8 oral presentations on the emerging aspects of proteomics, and metagenomics that included mining fish virus proteome for discovery of novel cell penetrating gene delivery peptides, use of manganese nanoparticles for mitigation of multifaceted stress in *Pangasianodon hypophthalmus* through the regulation of gene expressions, identification of plastic degrading genes from sediments of river Brahmaputra through metagenomics, whole mitochondrial genome analysis of Gangetic Koi, microbial gut profiling of Nile tilapia reared in cage culture system of the coal mining reservoirs of Jharkhand, tracking antibiotic resistance genes and virulence factors in *Aeromonas* spp., application of SNP markers for identification of genetic structure and population of Carnatic carp, and bioremediation capabilities of a wetland characterised through spatial successional studies of recovered bacterial isolates. Dr. B. P. Mohanty, and Dr. Gopal Krishna appreciated the views presented by the eminent lecturers and expressed their satisfaction with the research work presented by the young researchers in the field of OMICS in aquaculture and fisheries. Dr. A. Alam, ICAR-CIFRI and Dr. Kiran Rasal, ICAR-CIFE acted as the session rapporteurs.

Theme 5: Advances in fish nutrition research (AFNR)

Subtheme I: Advances in fish nutrition – waste to wealth

The AFNR subtheme on "Advances in fish nutrition – waste to wealth" was chaired by Dr. A. K. Pal, Former Joint Director of ICAR-CIFE, Mumbai, and Dr. N. P. Sahu, Joint Director of ICAR-CIFE, Mumbai. The session began with a presentation from Dr. Rajesh M., Scientist at ICAR-DCFR, who delivered the T. J. Pandian Award lecture on transforming cold-water aquaculture practices for sustainability and efficiency. His in-depth analysis covered aquaculture in hilly areas, emphasizing species such as rainbow trout, brown trout, and mahseer. He discussed the use of Recirculatory Aquaculture Systems (RAS) and the limitations of flow-through nursery systems, providing insights into optimizing biological filters. Dr. Rajesh M. concluded with highlights on rainbow trout feed development and year-round seed production of *Tor putitora* for sustainable growth in cold-water aquaculture.

The session's first lead talk was delivered by Dr. N. P. Sahu, Joint Director of ICAR-CIFE, Mumbai, who discussed the current state of publications in aquaculture nutrition and identified knowledge gaps in fish nutrition. He touched upon various aspects, including problems and challenges in fish nutrition, water requirements, precision aquaculture, biofloc technology, and the impact of climate change on aquaculture. He noted that India lags behind China and the USA in terms of research publications on aquafeed and nutrition, with limited studies on feed technology. Dr. Sahu emphasized that most global studies focus on larval and broodstock nutrition and the role of additives and nutraceuticals in fish nutrition. He concluded by identifying knowledge gaps in food safety, carbon footprint reduction, species diversification, system-specific feed development, and digestive physiology.

Dr. T. K. Ghoshal, Head of the Kolkata Regional Centre of ICAR-CIFE, delivered a lead lecture on the relevance of farm-made feeds in aquaculture. He provided quantitative data on global (2.9 million metric tonnes) and Indian production of aquafeed and highlighted alternative feed ingredients such as sunflower oil cake and cottonseed cake for higher profitability. Dr. Ghoshal discussed the use of distillery-dried grains and brewer grain meal in animal feed formulations, explaining their nutritional composition, including protein, fiber,

and energy contents. He stressed the potential of these ingredients as economical and sustainable feed sources. Additionally, Dr. Ghoshal discussed the use of various leaf meals as replacements for deoiled rice bran in aquafeed, promoting the sustainability and local biodiversity of indigenous plant leaf meals. He also mentioned various farm-level machinery and their specifications for efficient feed production.

Following the lead lectures, a series of oral presentations by students and scientists from India and Bangladesh ensued. Ms. Anwesha Bharoteshwari presented study on dietary incorporation of black soldier fly (BSF) larvae oil as a substitute lipid source for Silurid catfish (*Ompok pabda*). The presentation showed fish receiving a blend of BSF oil and soybean oil exhibited superior growth compared to those fed solely with soy oil. Mr. Bhuvaneshwaran T. explored the impact of incorporating defatted black soldier fly larvae meal into the diet of *Penaeus vannamei* juveniles raised in brackish water. He showed that utilizing environment-controlled BSFL allowed replacement of up to 75% of fish meal, while open-system BSFL facilitated a 50% replacement of fish meal without compromising growth performance, nutrient utilization, or physio-metabolic responses of *P. vannamei*.

Mr. Brundaban Sahu presented a paper on use of fish waste as silage and inferred that a silage-based diet resulted in 126% higher growth rate and up to 35% reduction in feed cost, as compared to the control diet. Mr. Mohnit Singh presented paper on dietary supplementation of moringa leaf powder to improve growth and reproductive capabilities of black molly (*Poecilia sphenops*). The presenter concluded that incorporating moringa leaf powder into the fish diet at optimal levels has the potential to significantly enhance growth and reproductive performance of black molly. Dr. Shamna N. presented paper on reproductive performance of farm-bred *Clarias magur* fed with defatted black soldier fly larvae. He claimed that incorporating up to 20% of BSFL with a balanced fatty acid profile can notably improve the reproductive performance and larval survival of the catfish. Mr. Shivanshu Garg presented work on the impact of

diverse mustard dietary allyl isothiocyanate on the biochemical and growth parameters of Indian major carps. Through haematological, blood biochemical parameters, histology and growth a correlation was observed between the presence of anti-nutritional factors in the feed and its effects on IMCs. Fishes fed with lower amounts of allyl isothiocyanate exhibited better growth performance and liver functions.

The Chairs pointed that a good number of papers have focussed on utilizing black soldier fly larvae as unconventional feed ingredients which underscores necessity to explore novel ingredients and their scaling up for replacing fish meal and fish oil in aquafeed. Dr. Sahu thanked Dr. T. K. Goshal for his insightful discussion on enhancing farm-made feed. Dr. Mishal P., ICAR-CIFRI and Dr. Tincy Varghese, ICAR-CIFE acted as rapporteurs in the session.

Subtheme II: Frontiers in fish feed additives, nutraceuticals, and feed management

The second session on fish nutrition research and the significance of nutraceutical and nutrigenomics applications in aquaculture was chaired by Dr. George John, former Vice-Chancellor of Birsa Agricultural University, Ranchi, Dr. S. D. Singh, Former ADG (Inland Fisheries), ICAR, and Dr. B.N. Paul, HoC, ICAR-CIFA, Kalyani. The session featured two lead lectures.

Dr. Ambasankar, Head of Division at ICAR-CIBA, presented a lecture on recent advances in fish nutrition research and emphasized the importance of nutraceutical and nutrigenomics applications in aquaculture. He discussed recent research efforts in fish nutrition, particularly on various conventional and unconventional ingredients. Dr. Ambasankar stressed the need to shift from conventional ingredients to novel options such as insect meal, DDGS, algal meal, biofloc meal, and single-cell proteins for fish feed production. He highlighted the value of precision nutrition and various nutraceuticals used in aquafeeds, as well as the regulation of aquafeed additives and quality control.

Dr. K.N. Mahanta, Head of Division at ICAR-CIFE, delivered a lecture on additives, nutraceuticals, and supplements used in aquafeed. He covered various studies on additives and supplements and their appropriate doses for different fish species. Dr. Mahanta also discussed the different commercially available additives and nutraceuticals specific to fish and shellfish. He provided guidance on the procedure and precautions needed when using various feed additives and emphasized the importance of regulations in the additive market. Additionally, he discussed the potential for developing organic additives and concluded by highlighting the scope for future research and innovation in this area.

There were ten oral presentations in the session. The first paper on synergistic influence of dietary integration of fermented soybean meal and mustard oil cake on the growth and health performance of climbing perch (*Anabas testudineus*) was delivered by Kazi Rakib. He concluded that the inclusion level of soybean meal (SM) and mustard oil cake meal (MOC) can be increased up to 25% with fermentation in the climbing perch diet without affecting growth or health performance. The second paper by Nur et al. focussed on dietary lipid requirement of *Neolissochilus hexagonolepis* fingerlings fed on isonitrogenous semi-purified diets and provided information for feed formulation with low-cost locally available ingredients. The next paper, presented by Sagar C. Mandal, focussed on positive effect of cystine rich diet in coloration of *Botia dario*, when incorporated with carotenoid (Marigold powder) and anti-tyrosinase (sesame seed). The colorimeter and organoleptic results showed that 0.5% cystine addition can enhance coloration. Next paper by Dar et al. showed that dietary supplementation ofqurectin@1600 mg/kg is a potential immunostimulant, besides increasing growth and immune gene expression in *Labeo rohita* fingerlings. The fifth paper by Gupta et al. focussed on pharmacokinetics and

detoxification mechanisms of benzimidazole derivatives and development of anthelmintic medicated feed for deworming and treatment of infested fish. He recommended fenbendazole at a single dose of 20 mg/kg and multiple doses of 20 mg/kg of on day 1, 3, 7 for effective of *Dactylogyrus* infection in *L. rohita*. The next paper by Kumari et al. studied mRNA expression of pancreatic α-amylase and growth-related genes during the initial ontogeny of *Channa striata*. The study has expanded the understanding of the larval fish digestive system's functionality and has contributed new insights into α-amylase gene expression in *C. striata* during ontogeny. The seventh paper by Saha et al. evaluated comparative efficacy of fluconazole and a nutraceutical-based combinatorial medicated feed in treating *Saprolegnia parasitica* infection in *Labeo rohita*. The study indicated comparable efficacy between fluconazole and the combinatorial medicated feed in reducing mortalities, while the latter additionally offered enhanced overall health benefits.

Dr.Koushik Ghosh presented paper on beneficial effects of dietary supplementation of a consortium of bacilli along with natural prebiotics on growth, feed utilization, metabolic function, immune status, and gene expression in *Labeo rohita.* The work concluded that the application of bacilli along with natural prebiotics might be useful to improve growth and health status in *L. rohita*. Next paper by Chakraborty et al. evaluated nutritional composition of different size groups and sexes of *Tenualosa ilisha*. The study concluded that the higher weight group of female Hilsa contained more nutritional value, while the same was observed in males with a weight range of 300 to 400g. The last paper of the session by Dhara et al. had evaluated effect of papaya (*Carica papaya*) leaf supplementation on growth performance of monosex *Oreochromis niloticus* and concluded that inclusion of papaya leaf powder @ 20% may be recommended as a feed additive to promote the fish growth.

The key session ended with suggestions,

including the need for scalability and pond validation of new alternative ingredients. It also emphasized the importance of dedicated feeds for mariculture and sea farming and the necessity of standardizing these feeds with functional additives. Dr. Suvra Roy from ICAR-CIFRI, Dr. Shamna N. and Dr. Dilip Kumar Singh from ICAR-CIFE recorded the session's discussions. Dr. Sona Yengkokpam from ICAR-CIFRI closed the session by offering a vote of thanks.

Theme 6: Frontiers in fish health management (FFHM)

Subtheme I: Fish disease emergence and surveillance

The session on fish disease emergence and surveillance, under the theme of Frontiers in Fish Health Management, aimed to explore the latest advances in fish health research, focusing on host-pathogen interactions, metagenomic applications for early disease diagnosis and management, and other developments in the field. The session, chaired by Dr. Iddya Karunasagar, Research Advisor at NITTE University, Mangalore, and Dr. Riji John, former Vice Chancellor of KUFOS, Kochi, consisted of four lead lectures followed by eight oral presentations.

Dr. Riji John delivered a comprehensive lecture on 'Microbiome Research in Disease Management in Aquaculture.' He highlighted advancements in microbiome research, particularly the identification of beneficial microbes that could enhance host fitness and disease resistance. Non-lethal sampling of aquatic animals and environmental DNA (eDNA) analysis have also emerged as potential tools in health research. Metrics like richness, evenness, and diversity derived from sequencing data reflect the complexity and stability of the gut microbiota. Dr. John suggested that faecal microbiota might become a promising area for future research.

Dr. M. Shashi Sekhar shared his research on host-pathogen interactions concerning shrimp and fish diseases, with a special focus on white spot syndrome virus (WSSV). His work emphasized understanding the complex dynamics of these interactions to develop effective management strategies.

Dr. T. J. Abraham introduced erythron-morphology as an emerging biomarker of fish health. He discussed various abnormally shaped erythrocytes (poikilocytes) commonly found in fish, such as acanthocytes, echinocytes, dacrocytes, schistocytes, spherocytes, and codocytes. These abnormal morphologies provide insights into fish pathophysiology and can indicate conditions like environmental stressors, infections, nutritional deficiencies, anaemia, inflammatory diseases, and toxic exposures. Understanding poikilocytosis and its relationship with fish health could significantly impact disease diagnosis, monitoring, surveillance, and management.

Dr. S. S. Mishra presented an overview of disease prevalence and health management issues in freshwater aquaculture, offering insights into the challenges faced by the industry and potential solutions for improving fish health management practices.

There were eight oral presentations. All the presentations were focused, and deliberations were made within scheduled time frame. Diverse topics of fish health management were covered including 'Evaluation of immune response and disease resistance in Koi carp (*Cyprinus rubrofuscus*) fed with biofilm of *Aeromonas hydrophila'*, 'Documenting the incidence of Tilapia parvovirus in apparently healthy Nile tilapia',

'Characterization and regulation of haemoglobin genes during hypoxia in *Labeo catla'*, 'Emergence of *Aphanomyces invadans*: assessing prevalence, pathology, and molecular detection in several native fishes of Sylhet', 'Tetracycline resistance potential and distribution of tetracycline resistance genes in heterotrophic bacteria from shrimp pond', 'Screening of bacterial and parasitic diseases in freshwater ornamental fish', 'Metanalysis on the parasites in barracudas; Case examination in *Sphyraena obtusata* along the Gulf of Mannar', 'The occurrence of *Lernaea* sp. infestation in the freshwater fishes of Gujarat'. Dr. Vikash Kumar, ICAR-CIFRI and Dr. Anirban Paul, ICAR-CIFA acted as rapporteurs in the session.

Subtheme II: Prophylaxis and fish health management

The sub-themed session on prophylaxis and fish health management was chaired by Dr. P.K. Sahoo, Director of ICAR-CIFA, and Dr. K.S. Sobhana, Principal Scientist at ICAR-CMFRI, and featured three lead lectures delivered by Dr. P.K. Sahoo, Dr. Azad I.S., and Dr. S.K. Manna. The session included six oral presentations and discussed recent advancements in fish disease management, emphasizing the use of modern aquaculture drugs and antibiotics.

One key issue addressed in the session was the potential residue concerns of aqua chemicals, pesticides, pharmaceuticals, and antibiotics in aquatic environments. Dr. S.K. Manna, Head of Division at ICAR-CIFRI, highlighted the importance of establishing nationwide testing facilities for residue analysis of aqua

drugs and pharmaceuticals used in aquaculture. This approach would help monitor and manage residue levels, ensuring safer practices in the industry.

The session also recommended the establishment of a national aquaculture laboratory to test aquaculture drugs, as well as the need for policymakers to restrict the indiscriminate and non-judicious use of aqua drugs to mitigate fish health management issues. Additionally, a national fish health policy was proposed to address the challenges associated with fish disease management more effectively. Several novel techniques were presented, including the use of poly-hexamethylene biguanide against saprolegnia infection and the bioremediation potential of aerobic heterotrophic bacteria like *Priestia aryabhattai* and *P. megaterium* for the oxidation of ammonia and nitrate. Molecular techniques for shrimp disease management were also explored, showing promise for the future of the industry. Dr. Suman Manna from ICAR-CIFE and Mr. Ratul Chakraborty from ICAR-CIFRI served as session rapporteurs, capturing the key discussions and recommendations for future reference.

Theme 7: Climate research in fisheries and aquaculture (CRFA)

The session on climate research in fisheries and aquaculture was chaired by Dr. M. Kurup, former Vice Chancellor of KUFOS, Kochi, and Dr. U.K. Sarkar, Director of ICAR-NBFGR, Lucknow. The session included four lead lectures that focused on various aspects of climate change and its effects on aquatic systems. Dr. M.K. Das, former Head of Division at ICAR-CIFRI, discussed the emerging anthropogenic stressors

impacting inland aquatic ecosystems and potential mitigation strategies. His lecture emphasized the growing pressures on aquatic environments and the need for effective responses.

Dr. M. Muralidhar from ICAR-CIBA delivered a talk on navigating sustainability, exploring greenhouse gas emissions, carbon footprint, and carbon trading in aquaculture. His lecture highlighted the importance of sustainable aquaculture practices and their role in addressing climate change challenges. Dr. Grinson George from ICAR-CMFRI shared pioneering initiatives in marine climate research aimed at promoting sustainable fisheries and aquaculture. His presentation showcased ICAR-CMFRI's commitment to understanding the impacts of climate change on marine ecosystems.

Dr. S.K. Nag, Principal Scientist at ICAR-CIFRI, underscored the importance of wetlands as a strategic resource for coping with climate change. He discussed the role of wetlands in mitigating climate change effects and preserving biodiversity. The lead lectures were followed by oral presentations covering various aspects of climate research in fisheries and aquaculture, providing valuable insights into ongoing research efforts and potential areas for further study.

Rapporteurs Dr. Suman Kumari from ICAR-CIFRI and Dr. Rejani Chandran from ICAR-NBFGR documented the key discussions and outcomes of the session, which contributed to a better understanding of climate research in the fisheries and aquaculture sectors and offered guidance for future research and policy development in these fields.

Theme 8: Innovations in fish harvest and post-harvest technology (IFPT)

Subtheme 1: Advances in harvest technology and fish products

The session on innovations in fish harvest and post-harvest technology, with a focus on advances in harvest technology and fish products, was chaired by Dr. George Ninan, Director of ICAR-CIFT, Kochi, and Dr. U. Sreedhar, HoC of Visakhapatnam, ICAR-CIFT. The session included two lead lectures and a series of oral presentations, all aimed at highlighting new developments in sustainable fisheries and innovative harvest technologies.

Dr. Ninan's lead lecture focused on sustainable harvest technologies and the efficient use and management of aquatic resources. He emphasized the importance of global aquaculture production in meeting human fish consumption needs worldwide. He covered several key points such as the wild catch, gear used in inland capture fisheries, responsible and low-energy fishing practices, shorter duration trips, smart gear, and alternate fuel options for gear. He discussed the impact of trawlers on marine catch and incidental turtle catches, highlighting technical measures like the use of a minimum mesh size net (TED, Nordmore, JFE-SSD) to minimize bycatch. Dr. Ninan also discussed advanced processing technologies, including topics such as hurdle technology, commercial value-added products, nutraceutical products, spirulina-based cookies, bivalve and mussel pickles, and the use of the e-commerce platform.

Dr. Sreedhar's lead lecture emphasized innovations in fish harvesting technology to achieve a balance between sustainability and efficiency. He discussed the increasing global demand for seafood due to population growth and rising incomes, and the need for sustainable fisheries management to support the expanding seafood trade. His lecture touched on active and selective fishing gear, remote sensing, autonomous underwater vehicles (AUVs), economic and ecological considerations, and trawling for Antarctic krill. He highlighted ICAR-CIFT's initiatives in the development of large mesh purse seine, models to reduce bycatch, improved lobster traps, deep-sea gears, PFZ validation, green fishing systems for tropical seas, and improved trammel and gill nets for inland waters.

Following the lead lectures, the session featured oral presentations on various aspects of fishing technology, fishery products, and by-products. These presentations provided insights into the latest research and practices in the field. Dr. Sandhya K.M. from ICAR-CIFT and Dr. Leesa Priyadarshini from ICAR-

CIFE acted as rapporteurs, capturing the key discussions and outcomes from the session.

Subtheme II: Advances in fish processing technology

The sub-themed session on advances in fish processing technology was chaired by Dr. G. Sugumar, former Vice-Chancellor of Tamil Nadu Dr. J. Jayalalithaa Fisheries University, Nagapattinam, and Dr. B.B. Nayak, HoD of ICAR-CIFE, Mumbai. The session featured three lead lectures, each discussing various aspects of fish processing and its advancement in India.

Dr. B.B. Nayak began by addressing the challenges in developing science-based standards for Indian seafood within the global food standard framework. He emphasized the need for the scientific community to collaborate with the Food Safety and Standards Authority of India (FSSAI) and the Bureau of Indian Standards (BIS) to identify and characterize hazards, conduct exposure assessments, and devise methods to minimize or eliminate risks. He stressed the importance of greater scientific efforts to improve the safety, quality, and market competitiveness of Indian seafood products.

Dr. L.N. Murthy from NFDB, Hyderabad, presented a lecture on the sustainable development of the fish harvest and post-harvest sector, focusing on government initiatives in India. He discussed the transformative impact of the Pradhan Mantri Matsya Sampada Yojana (PMMSY), a flagship scheme introduced by the Indian

government. This initiative aims to revolutionize the Indian fisheries sector and enhance its productivity and sustainability.

Dr. Ranendra Kumar Majumder, Former Professor and Head of the Department of Fish Processing Technology & Engineering at CAU, Imphal, highlighted the scope of innovations and entrepreneurship in India's fish processing sector. He mentioned that fish and fish products have become the largest group in agricultural exports from India, with a substantial volume and value during the fiscal year 2022-23. Despite challenges, business incubators play a critical role in transforming innovative ideas into reality, supporting entrepreneurs in bringing their products to market. He encouraged the government to act as a catalyst to support these entrepreneurs.

The session also included three oral research paper presentations. The first

presentation by Kirankumar Gopalbhai Baraiya et al. examined the effects of Bullseye and Pacu protein isolates and storage conditions on oat-based cookie quality. Remya et al. presented their findings on the effects of advanced infrared drying technology and reduced oxygen packaging atmosphere on the quality of flower tail shrimp, discovering that shrimps packed in PEST-PE laminated film pouches offered superior quality characteristics. The third presentation by Prasanta et al. focused on the production, characterization, and storage stability of fish pithe, a traditional Indian fish cake, which retained its acceptability for up to 14 days under refrigerated storage conditions.

Dr. T. T. Paul from ICAR-CIFRI and Dr. Bahni Dhar from CoF, Lembucherra, served as rapporteurs for the session.

Theme 9: Aquatic ecosystem health and emerging contaminants (AEHC)

SubthemeI*: *Metal, plastic, and emerging contaminants

The session focused on metal, plastic, and emerging contaminants in aquatic ecosystems was chaired by Dr. K.K. Vass, former Director of ICAR-CIFRI, Dr. Vasudevappa, former Vice-Chancellor of NIFTEM, and Dr. R.K. Trivedi, Professor at WBUAFS. Three lead lectures were delivered by Dr. M.K. Das, K.K. Krishnani, and Dr. S. Samanta, discussing significant issues related to aquatic ecosystem health and the challenges posed by various anthropogenic stressors.

Discussions emphasized the threats posed by established and emerging stressors, such as untreated sewage and antibiotic pollution in rivers. These pollutants were noted to degrade environments and impact inland fisheries. Climate change's effects on the breeding performance of Indian Major Carps (IMCs) due to reduced rainfall were acknowledged, prompting recommendations for holistic assessments, political unity, surveillance, monitoring, and mass movements to address these challenges effectively.

The session speakers recognized the potential of marine natural products with nutraceutical and therapeutic properties to improve human health. Concerns about arsenic contamination in fisheries and aquaculture, leading to adverse effects such as cataracts in fish, were also noted. Optimizing pond fertilization to reduce organic pollution and monitoring heavy metals like chromium and lead in urban areas were proposed as practical measures to safeguard human and animal health. Innovative solutions such as clay polymer composites for sewage treatment, enhancing heavy metal absorption rates, were highlighted. Discussions also addressed the impact of bisphenol on fish breeding, the presence of microplastics in fish gut, and heavy metal pollution in the Yamuna River system.

Noteworthy findings included the lethal effect of nano-formulations of emamectin benzoate on fish and the contribution of plastic bags to marine debris.

The session concluded with a call to prioritize mitigation efforts to remove contaminants from ecosystems and improve overall ecosystem health, stressing the urgent need for action in this critical area. The session rapporteurs were Dr. Rakesh Kumar from ICAR-CIFRI and Dr. Himadri Saha from CoF, Lembucherra.

Subtheme II: Biological and microbial contaminants

The second session on emerging contaminants and aquatic ecosystem health was chaired by Dr. B. Manimaran, former Vice Chancellor of TNJFU, Dr. G. Chattopadhyay, and Dr. Pradip Dey, Director of ICAR-ATARI, Kolkata. Dr. Gopala Krishna Darbha from the Department of Earth Sciences and Centre for Climate and Environmental Studies at IISER Kolkata delivered a talk on the fate and bioaccumulation of microplastics in Indian fresh and coastal waters. His discussion provided insights into the status of microplastic abundance in key Indian aquatic systems and highlighted the dangers of nano-plastics, which are even more hazardous than microplastics. His team's research on bioaccumulation of microplastics in freshwater and coastal fish raised concerns about the risk of human exposure to microplastics through fish consumption.

Dr. Kishore Kumar Krishnani of ICAR-IIAB, Ranchi, followed with a lead lecture on microplastics as environmental contaminants, emerging concerns, and their potential threats and mitigation strategies. His presentation covered the occurrence and potential threats of microplastics, their complexity, and the challenges of monitoring and mitigating them using system biology approaches.

The session featured ten oral paper presentations on topics including immunological manifestations of contaminants in fishes, the influence of nutrient enrichment on fish life-history traits, bioaccumulation of heavy metals, limno-chemistry and nutrient transport in wetlands, the trophic status of Himalayan lakes, alterations in growth and stress enzymes due to exposure to contaminants like triclosan, transcriptome profiling of fishes in response to riverine pollution, and a novel approach using metal oxide nanocomposites to control algal blooms.

The chairs praised all the lead speakers and presenters for their contributions. Major recommendations from the session included the need to develop robust techniques for quantifying nanoplastics (NPs) and microplastics (MPs), identifying fish species that accumulate fewer NPs and MPs, and studying the trophic or species-level bioaccumulation of NPs or MPs. The session rapporteurs were Dr. Vikas Kumar from ICAR-CIFRI and Dr. Sudeshna Sarkar from CoF, Kishanganj.

Theme 10: Precision farming, ICT, sensors, GIS, robotics in fisheries science research (PICT)

The session on "Precision farming, ICT, sensors, GIS, robotics in fisheries" took place on the third day of the 13th International Fisheries and Aquaculture Forum (IFAF). The session was chaired by Dr. Amitabha Bondyopadhyay, Chairman (TAC), ICAR-NePPA, and Dr. R.N. Sahoo, Principal Scientist, IARI and Program Leader (ICAR-NePPA). Distinguished dignitaries such as Dr. J. K. Jena, DDG (Fishery Science), ICAR, New Delhi; Dr. B.P. Mohanty, ADG (Fishery Science), ICAR, New Delhi; Dr. Dilip Kumar, Former Director, ICAR-CIFE, Mumbai; Dr. B.K. Das, Director, ICAR-CIFRI, Barrackpore; and Dr. P. K. Sahoo, Director, ICAR-CIFA, Bhubaneswar, were also present during the session.

Dr. B.K. Das, Director of ICAR-CIFRI, opened the session by welcoming the chairs and highlighting the importance of advanced technologies in the fisheries sector. Dr. R.N. Sahoo, the lead speaker and chair, provided insights into the application of ICT, drones, sensors, robotics, big data, and machine learning in agriculture and fisheries. He emphasized the need to modernize the agriculture system with advanced technologies to achieve production potential while maintaining sustainability.

Dr. J.K. Jena, DDG (Fisheries Science) at

ICAR, echoed these sentiments and stressed the significance of embedding advanced technologies in fisheries for efficient management and sustainable production.

Researchers and students from India and Bangladesh presented their work, including topics such as:

- TurbAqua: A mobile app for detecting turbidity using water color.
- Spatio-temporal change dynamics of Mayabon and Ratargul Swamp Forests of Sylhet, Bangladesh.
- Matsya Varta: A mobile app for smart ICT application in aquaculture in Northeast India.
- EIA appraisal for IMC farming employing LCA.
- AI-ML modeling of biotic and abiotic parameters of River Yamuna.
- RiverAquaMap: A web-GIS application for fishery resource assessment.

Dr. Amitabha Bondyopadhyay, chair of the session, engaged with the presenters and attendees, offering valuable suggestions to improve the research findings. He stressed the importance of refining the ICT knowledge base before sharing it with farmers.

The program was coordinated by Dr. D.N. Jha, In-charge, ICAR-CIFRI Prayagraj center. Rapporteurs Dr. Chayna Jana, Scientist, ICAR-CIFRI, and Dr. Kamalesh Panda, Asst. Prof, CoF, Kawardha, summarized the key takeaways and recommendations for future research and development.

Theme 11: Social science research in fisheries and aquaculture (SOSF)

The session on social science research in fisheries was chaired by Dr. P.K. Katiha, Former Principal Scientist, ICAR-CIFRI, and Dr. Arpita Sharma, Head of the FEES Division at ICAR-CIFE, Mumbai. The session commenced with introductory remarks from the chairs, emphasizing the importance of social science research in the fisheries sector and the need to address human-centered issues within the industry. Following the introduction, the participants introduced themselves.

The first presentation was made by Dr. Arun Pandit, Principal Scientist at ICAR-CIFRI. He discussed the socio-economic inequality among fishers in the Chilika lagoon of India. He highlighted how fishers have received benefits such as improved dwellings, which has led to greater resilience and enhanced infrastructure. His presentation sparked discussions about the importance of addressing inequalities to improve the well-being of fishing communities.

Dr. Arpita Sharma then presented an analysis of patents in India's fisheries and aquaculture sector over the past century. Her presentation provided a cross-sectoral comparison, including patents in agriculture, veterinary science, and dairy sectors, along with a breakdown of applicant distribution. Her insightful analysis prompted engaging discussions from the participants.

Dr. Shyam Salim, Principal Scientist at ICAR-CMFRI in Cochin, offered an extensive analysis of the marine fisheries sector in India. He discussed the transformation of the sector over the past century and addressed issues related to livelihoods in marine fisheries. He emphasized the need for appropriate policy interventions to achieve sustainable fisheries development in India.

Dr. Nikita Gopal, HoD at ICAR-CIFT, Cochin, presented a lead lecture on "Social science research in fisheries: Need for trans-disciplinary approaches." She stressed that fisheries are socio-ecological systems that involve food, nutrition, livelihoods, and income, requiring a focus on human elements within the industry.

After the lead lectures, there were 10 oral presentations on ongoing social science research in Indian fisheries and aquaculture. Topics included beel fisheries, reservoir and riverine fisheries, scampi enhancement technology in Jharkhand reservoirs, and small-scale marine fisheries, among others. These presentations highlighted the diverse challenges and opportunities within the sector.

The chairs recommended that social science research in fisheries and aquaculture should be integrated into all aspects of the sector for holistic and sustainable development. They emphasized the need to prioritize the well-being of people working in the industry. Dr. Sonalika Sahoo from ICAR-CIFRI and Dr. Ipsita Biswas from CoF, Pusa, acted as rapporteurs for the session, summarizing key points and recommendations for further consideration.

Theme 12: Mariculture and seaweed farming (MRSF)

The special session on Mariculture and Seaweed Farming (MRSF) was held on February 25, 2024, and chaired by Dr. Madan Mohan, Former ADG (Marine Fisheries), ICAR, and Dr. Shubhadeep Ghosh, ADG (Marine Fisheries), ICAR. The session included four lead lectures and multiple oral presentations, focusing on various aspects of mariculture and seaweed farming.

Dr. Shubhadeep Ghosh began the session with an overview of the present status of marine fisheries in India. He emphasized the importance of mariculture as a strategy to enhance marine fisheries production, particularly through the cultivation of species such as Cobia, Silver Pompano, Indian Pompano, Orange Spotted Grouper, and Sea Bream. He also discussed integrated multi-trophic aquaculture, which involves combining finfish and seaweeds for sustainable production.

Dr. Imelda Joseph, Principal Scientist at ICAR-CMFRI, delivered a lead lecture on innovative farming systems that promote sustainability in mariculture. She stressed the importance of Integrated Multi-Trophic Aquaculture (IMTA), Precision Fish Farming (PFF), offshore mariculture, and circular aquaculture for sustainable marine fisheries. Dr. Joseph highlighted the need for collaboration, innovation, and strategic policies to ensure global sustainable aquaculture.

Dr. Joe Kizhakoodan, Head of ICAR-CMFRI in Vishakhapatnam, discussed marine ecosystem restoration

and conservation mariculture. He provided an in-depth analysis of the National Mission Programme under the PMMSY, which focuses on installing artificial reefs and sea ranching for sustainable fisheries and livelihoods. The artificial reefs are developed to enhance coastal productivity and placed within the fishery jurisdiction of the traditional non-mechanized sector, in line with state MFRA regulations.

Dr. Ganesh K., Assistant Director at MPEDA, gave a lecture on aquaculture diversification efforts in India led by MPEDA-RGCA. He highlighted how the applied research conducted by RGCA on culture technologies for diversified species can expand India's export-oriented aquaculture base beyond conventional species, including high-value finfish and shellfish. RGCA also offers professional training and consultancy services to support entrepreneurs in diversified aquaculture.

Dr. Mohammed Koya, Senior Scientist at ICAR-CMFRI, delivered a lead presentation on unlocking India's seaweed potential, with a focus on Lakshadweep as a new hope-spot for seaweed enterprise development. He discussed the potential for transforming Lakshadweep into a seaweed hub for India, contributing to economic opportunities, regional job creation, additional income for coastal communities, and mitigating India's carbon emissions.

A total of 13 oral papers were presented in the session, covering topics such as the culture of edible green seaweed in a multilayer running water system, GIS-based site selection and marine spatial planning, temperature-dependent biomass production of marine microalgae, genetic parameters of growth efficiency in Silver Pompano, reproductive biology of Abudefduf vaigiensis, and patterns of reproductive cycles in two sea urchins. Other topics included the potential of seaweeds in IMTA, production intensification and environment management through sea cage farming, oyster culture, indoor cultivation of sea lettuce, and maturation and reproductive cycles of crabs.

Mr. Roshith C.M. from ICAR-CIFRI and Dr. Pooja Saklani from CoF, Kishanganj, acted as rapporteurs and recorded the proceedings of the session. The session concluded with a vote of thanks proposed by Dr. Thankam Theresa Paul from ICAR-CIFRI.

Theme 13: Frontiers in shellfish farming (FSFF)

The session on shellfish farming was chaired by Dr. K.K. Lal, Director of ICAR-CIBA in Chennai, and Dr. B.R. Pillai, Principal Scientist at ICAR-CIFA in Bhubaneswar. The session featured two lead lectures, each addressing significant aspects of shellfish aquaculture and prawn cultivation.

The first lead lecture was delivered by Dr. C.P. Balasubramanian from ICAR-CIBA. His presentation centered on the current status, challenges, and issues associated with the captive reproduction of penaeid shrimps. He highlighted the opportunities provided by species diversification within the penaeids and stressed the importance of refining reproductive management and strategies tailored to individual species.

The second lead lecture was given by Dr. B.R. Pillai from ICAR-CIFA. She discussed the status of recent research and the future of giant prawn cultivation. Dr. Pillai emphasized the need for wider dissemination of genetically improved (GI) scampi and active promotion of polyculture. She also called for the establishment of a dedicated brood bank for sustainable shrimp aquaculture in India, suggesting that diversification and genetic improvement of native shrimp species could drive economic recovery and open new markets in Asia and Africa.

Following the lead lectures, the session included the oral presentations of 10 papers covering a variety of topics related to shellfish farming. These presentations explored diverse areas such as the impact of crab box dimensions on mud crab growth and moulting, indoor vertical HDPE box culture and mud crab fattening, responses of brine shrimp and freshwater prawn to biotic and

abiotic stressors, physiological reactions of freshwater pearl mussels to stress, tank-based broodstock development of Indian white shrimp, emerging white feces syndrome in farmed Pacific white shrimp in inland saline waters, the potential for livelihoods and women's empowerment in coastal communities through bivalve farming, the economic feasibility of white-leg shrimp, performance of genetically improved freshwater prawn, and nursery-integrated and multi-phase-based farming of penaeid shrimps.

The session rapporteurs were Dr. Pritijyoti Majhi from ICAR-CIFRI and Dr. Farhana Hoque from ICAR-CIFA, who played a key role in summarizing the session's discussions and providing insights into the overall direction of shellfish farming research.

Satellite Symposia

Fish genetic resource &conservation (SSFG)

A Satellite Symposium on Fish genetic resources and conservation was jointly organized by ICAR-National Bureau of Fish Genetic Resources, Lucknow and ICAR-Central Inland Fisheries Research Institute, Barrackpore, to spotlight the critical role of aquatic genetic resources in sustainable development, conservation efforts, and the innovative approaches required to address contemporary challenges. The event received an overwhelming response

from the delegates chaired by Dr. A.G. Ponniah, Former Director, ICAR-CIBA & NBFGR; and Dr. Dhriti Banerjee, Director, Zoological Survey of India in the presence of Chief Guest Dr. J.K. Jena, DDG (Fisheries Science) and other delegates like Dr. Dilip Kumar &Dr. Gopal Krishna, Former VCs, ICAR-CIFE; Dr. U.K. Sarkar, Director, ICAR-NBFGR; Guest of Honour, Dr. B. K. Das, Director, ICAR-CIFRI; Dr. P. Krishnan, Director, BOBP-IGO; Dr. B. Madusoodhana Kurup, Former VC, KUFOS; Dr. T. T. Ajith Kumar, Head, CPAGR, ICAR-NBFGR; Dr. Basdeo Kushwaha, Principal Scientist, ICAR-NBFGR among others.

On this occasion, 6 lead, 10 oral and 16 poster paper presentations on various aspects of aquatic genetic resource management were held. The following key recommendations have emerged from the deliberations in the satellite symposium:

- Prioritisation of the aquatic agrobiodiversity conservation efforts to maximise the impact of fish genetic research outcomes.
- Adapting innovative approaches and emerging tools to advance the sustainable management of aquatic genetic resources to address contemporary environmental challenges.
- Intensive efforts to explore unreached areas for fish diversity, distribution, and conservation.
- Harnessing the genomics tools for regional fisheries management, especially in the marine sector.

- Implement the participatory approaches for conservation, harmonising the likelihoods.
- Transformative efforts towards the genomics and transcriptomics studies of fishes for implications in aquaculture and conservation.

Further, a book, "*Sustainable Conservation and Management of Aquatic Genetic Resources of India: Recent Perspectives*" in Hindi, edited by Dr U. K. Sarkar, Dr L. K. Tyagi, Dr T. Kumawat and Sh. Subhash Chandra and jointly published by Narendra Publication House, New Delhi and ICAR-NBFGR, Lucknow was released. The satellite symposium event was coordinated by Dr. U. K. Sarkar, Dr. A. Kathirvelpandian, Dr. Murali S., Dr. Rejani Chandran and Dr. T. Kumawat from ICAR-NBFGR and Dr. A. K. Bera, Dr. Kavita Kumari, Dr.Suvra Roy, Dr. Vikash Kumar, Ms. Ramya V. L. and Ms. Niti Sharma from ICAR-CIFRI. Dr. A. Kathirvelpandian and Dr. T. Kumawat were rapporteurs in this session.

North East fisheries (SSNE)

A satellite symposium on "Sustainable Fisheries and Aquaculture in Northeast India" was held on February 24, 2024, as part of the 13th International Fisheries and Aquaculture Forum (IFAF). The session was chaired by Dr. V.V. Sugunan, former ADG (Inland Fisheries), ICAR, and Prof. Ratan Kumar Saha, Vice-Chancellor, Techno India University, Tripura. The symposium aimed to shed light on the unique challenges and opportunities facing the fisheries and

aquaculture sectors in Northeast India and to discuss sustainable approaches to harnessing the region's abundant aquatic resources.

The session featured four lead speakers who addressed various aspects of the

region's fisheries and aquaculture. Prof. A. B. Patel, Dean, College of Fisheries, Tripura, emphasized the importance of diversifying species, systems, and feed resources in the aquaculture sector, given the local availability and significance of different options. Dr. S. K. Majhi, Head of Centre, ICAR-CIFRI, RC, Guwahati, discussed the application of cutting-edge technologies for conserving and reviving vulnerable species of local importance. Dr. B. K. Bhattacharjya, Principal Scientist, ICAR-CIFRI, RC, Guwahati, spoke about ecosystem-based fisheries management in floodplain wetlands of Northeast India, which is vital for sustainably enhancing fish production from these vast and productive resources. Dr. C. Basudha Devi, Principal Scientist, ICAR RC for NEH Region, Manipur, highlighted the region's rich diversity of highly-priced ornamental fish and the entrepreneurial opportunities it presents.

In addition to the lead lectures, the session included six oral presentations covering a range of emerging topics. These topics included the ichthyofaunal

diversity in floodplain wetlands in relation to seasonal habitat variables, the effect of paragrass feeding on the meat quality of grass carp, the use of a weighted water quality index to determine a waterbody's suitability for fisheries, the concept of floating pens (phumdi-based) for polyculture of small indigenous fishes (such as mola) with major

carps (such as grass carp and rohu) in Loktak Lake of Manipur, and basic research on the color patterns of Bariline fishes of Arunachal Pradesh.

Dr. Sugunan emphasized the potential of the Northeast Region in terms of its abundant aquatic open water resources and their untapped potential, and expressed satisfaction with the ongoing research work in the region. Dr. Dipesh Debnath, ICAR-CIFRI, recorded the session proceedings as rapporteur, documenting the insightful discussions and findings from the symposium.

Riverine fisheries management (SSRF)

The satellite symposium on "Riverine Fisheries, Habitat Mapping, and Environmental Health" was conducted during the 13th Inland Fisheries and Aquaculture Forum (IFAF) in Kolkata, West Bengal, on February 25, 2024. The symposium was organized under the sponsorship of the elite Namami Gange initiative of the National Mission for Clean Ganga (NMCG), which is a branch of the Ministry of Jal Shakti, Government of India. This initiative is a comprehensive program aiming to rejuvenate and conserve the Ganges River and its tributaries, making it a key player in preserving the biodiversity and environmental health of India's riverine ecosystems.

Dr. U. P. Singh, former Secretary of the Ministry of Jal Shakti in New Delhi, graced the symposium as the keynote speaker. His talk, titled "Biodiversity Conservation: An Integral Component of Namami Gange," emphasized the overall thrust that the Namami Gange program has placed on biodiversity conservation. He outlined how the initiative aligns with the vision of the Hon'ble Prime Minister of India, Shri Narendra Modi, emphasizing the importance of integrating biodiversity conservation with efforts to revitalize the Ganges.

The symposium featured six lead lectures by renowned scientists and academics who brought a wealth of expertise and insight to the discussions. These included Dr. B.K. Das, Director of ICAR-CIFRI and Principal Investigator of the ongoing ICAR-CIFRI NMCG project. Dr. Das outlined the various activities undertaken by the institute over the last eight years to revive fish diversity and populations in the River Ganga, including extensive river ranching programs and ecological assessments. He highlighted the significant strides made in restoring the upstream Hilsa fisheries and other native species.

Dr. Utpal Bhaumik, former Head of the Department at ICAR-CIFRI, emphasized the critical importance of managing the overall health of the Ganga and protecting the Hilsa fisheries, which hold immense cultural and economic significance. Dr. Sandeep Kumar Behera, a senior consultant at NMCG, provided an overview of the efforts being made to conserve biodiversity and revitalize the Ganga. He stressed the long-term goals of NMCG to reestablish the river's endangered and endemic species within their historical ranges, thereby restoring the natural balance and sustainability of the river's ecosystems.

Dr. R.K. Manna, Head of the Department at ICAR-CIFRI, discussed the impact of impoundments on fisheries and riverine ecosystems, drawing valuable lessons from India's peninsular rivers. He stressed the need for sustainable management and restoration practices to ensure the continued health and productivity of these vital water bodies. Dr. P. Nautiyal, former professor at Garhwal University, presented his findings on the

ecological condition of the Alaknanda River in Srinagar and the decadal shift in its diatom community structure. His talk offered insights into the changes occurring within this important river system.

After the lead lectures, nine oral presentations explored various topics related to the ecological and fish diversity of the Ganga River, including the impacts of human activity and environmental changes on the river's health. The session concluded with closing remarks from the session chairs, Dr. U. P. Singh and Dr. Utpal Bhaumik, summarizing the key takeaways and insights shared during the symposium.

The session proceedings were documented by Dr. V.R. Thakur and Mr. Mitesh Ramteke, both scientists from ICAR-CIFRI, who served as rapporteurs.

Natural farming

The Satellite Symposium on Natural Farming, a notable and distinctive event at the 13th Inland Fisheries and Aquaculture Forum (IFAF), took place on the second day of the conference. The program commenced with a warm welcome address by Dr. D.K. Meena, Senior Scientist at ICAR-CIFRI in Barrackpore. The symposium was chaired by two distinguished individuals: Dr. S. D. Singh, Former Assistant Director General (Inland Fisheries) at ICAR, New Delhi, and Dr. Gauranga Kar, Director of ICAR-CRIJAF in Barrackpore.

The symposium featured lead lectures delivered by esteemed

experts such as Dr. Shivakumar Magada, Dr. N.N. Pandey, and Dr. Yusufzai. These talks focused on various aspects of natural farming, including the concept, current status, and future prospects. Following the lead lectures, a panel discussion took place, during which three major points emerged as key areas of focus:

1. Establishment of a Task Force: The panelists emphasized the need to establish a dedicated task force on natural farming. This body would work towards setting goals, developing strategies, and monitoring progress in promoting natural farming practices.
2. Subsidy for Natural Farming: There was a strong call for subsidies to be provided as an incentive to encourage the adoption of natural farming methods. This support would help farmers transition to more sustainable practices and contribute to the growth of the sector.
3. Development of Standard Operating Procedures: The panel discussed the importance of creating clear and standardized operating procedures for natural farming. These guidelines would help eliminate confusion between natural and organic farming, providing farmers with clarity and a clear path forward.

The symposium marked a promising beginning for the exploration and advancement of natural farming as a national mission. The event concluded on an enthusiastic note with a vote of thanks to the organizers and participants. The program was coordinated by a team of dedicated scientists, including Dr. D.K. Meena, Dr. A.K. Das, Dr. M. Shaya Devi, Dr. V.R. Thakur, Ms. Jesna P.K., and Mr. Satish Koushlesh, under the overall guidance of Dr. B.K. Das, Director of ICAR-CIFRI and Convener of the 13th IFAF.

Dr. Jesna P.K. and Dr. M. Shaya Devi, both scientists from ICAR-CIFRI, served as rapporteurs for the session, ensuring that the discussions and outcomes were meticulously documented. The symposium's emphasis on collaboration and

innovation signaled a commitment to furthering the cause of natural farming and its potential to revolutionize sustainable agricultural practices.

Theme-wise Poster Sessions

The poster presentation of research papers in the Forum was organized in multiple digital displays in offline mode allowing researchers to physically present their research findings in respective theme areas. This was unique in the sense that it was like oral presentation of the research finding in single slide, conducted by two Chairs-cum-jury in respective thematic area. The posters of 13 themes and three satellite symposia were displayed in 5 large digital display systems simultaneously to facilitate conduction of five sessions at a time on 2nd and 3rd days of the Forum. Like in oral sessions, presentations in thematic areas having many papers were conducted in more than one session and thus a total of 27 sessions were conducted providing ample scope to more than 250 researchers to present their research.

The poster papers under themes, viz. *Open water fisheries resource management, Innovations in Aquaculture towards inclusive growth,* and Advances *in Fish nutrition research, nutraceuticals and nutrigenomics* were presented in three sessions each. The posters papers of 5 themes, viz., *Frontiers in fish health management, Climate research in fisheries and aquaculture, Innovations in harvest and post-harvest technology, Aquatic*

ecosystem health and emerging contaminants, and *Social science research in fisheries and aquaculture* were conducted in 2 sessions each. Rest of the themes, viz., *Small scale fisheries addressing SDGs & vulnerability to viability*, *OMICs approaches in fisheries and aquaculture*, *Precision farming, ICT, sensors, GIS, robotics in fisheries*, *Mariculture and seaweed farming* and *Frontiers in shellfish farming* were conducted in single session each. Satellite symposium on *Riverine fisheries, habitat mapping and environmental health*, *Sustainable fisheries in North East India*, and *Fish genetic resources and conservation* were conducted in single session each. In each session/sub-session posters were evaluated by Chair-cum-Jury and best researchers, like in oral sessions, were awarded with best poster presentation awards. Eminent retired/ working Scientists and Professors from Central and State Universities and ICAR institutes acted as Chairs.

Theme-wise poster presentations were as below:

Theme	**Chair(s)**	**No. of papers presented**
Theme 1: OFRM - Open water fisheries resource management	Dr. A.P. Dinesh Babu, Dr. P.K.Saharia, Dr. P. Panikkar, Dr. D.N. Jha	30
Theme 2: IAPG - Innovations in aquaculture production towards inclusive growth	Dr. B.K. Bhattacharjya, Dr. B.K. Mahapatra, Dr. Archana Sinha, Dr. A.B. Patel, Dr. Sona Y.,	29
Theme 3: SSFS - Small-scale fisheries addressing SDGs & Vulnerability to	Dr. T. S. Nagesh	7

Viability (V2V) in fisheries

Theme 4: OMIC - OMICs approach in fisheries and aquaculture	Dr. Sagar Mandal, Mr. P. Maurye	9
Theme 5: AFNR - Advances in fish nutrition research, nutraceuticals, and nutrigenomics	Dr. K.N. Mohanta, Dr. Kajal Chakraborty, Dr. Debasis De, Dr. Neeraj Kumar, Dr. T.K. Ghoshal	26
Theme 6: FFHM - Frontiers in fish health management	Prof. T.J. Abraham, Dr. A.K. Bera, Dr. Gayatri Tripathi	24
Theme 7: CRFA - Climate research in fisheries and aquaculture	Dr. S.K. Nag, Dr. A.P. Dinesh Babu, Dr. M. Muralidhar, Prof. S.K. Das	17
Theme 8: IFPT - Innovations in fish harvest and post-harvest technology	Dr. U. Sreedhar, Dr. P. Md. Ashraf, Prof. R.K. Majumder, Dr. Toms C. Joesph	11
Theme 9: AEHC - Aquatic ecosystem health and emerging contaminants	Dr. H. Chowdhury, Prof. G. Chattopadhyay, Dr. M.A. Hassan, Dr. S.K. Das	21
Theme 10: PICT - Precision farming, ICT, sensors, GIS, robotics in fisheries	Dr. M. Naskar	4
Theme 11: SOSF - Social science research in fisheries and aquaculture	Dr. P.S. Swathi Lekshmi, Dr. A. Pandit, Dr. Arpita Sharma, Dr. Biswajit Lahiri	16
Theme 12: MRSF - Mariculture and seaweed farming	Dr. T.T. Ajith Kumar, Dr. M. Kailasam	9
Theme 13: FSFF - Frontiers in shellfish farming	Dr. Kiran Dubey	7
Satellite Symposium: SSFG - Fish genetic resource and conservation	Dr. B.K. Behera	11
Satellite Symposium: SSRF - Riverine fisheries, habitat mapping and	Dr. S. Samanta, Dr. Manas	17

environmental health	H.M.	
Satellite Symposium: SSNE - Sustainable fisheries and in North East India	Dr. S.C.S. Das	12

Awards presentations

AFSIB Awards

In the backdrop of 13th IFAF, the AFSIB called for applications for awards in different categories. Prof. H.P.C. Shetty Award was called for researchers involved in fisheries research and development below 50 years and the award carried a cash prize of ₹25000, a medallion and an invitation to deliver keynote address in the forum. Dr. Grinson George of ICAR-CMFRI and Dr. Binsi P. of ICAR-CIFT were awarded with the Prof. H.P.C. Shetty award and both of them made presentations in the Conference. Dr. Pillay Aquaculture Award was called for researchers with outstanding work on any aspect of aquaculture (research/extension/ development) carried out in India and the award carried a cash prize of ₹ 25000, a citation and invitation to deliver keynote address in the forum. Dr. Kedar Nath Mohanta of ICAR-CIFE was awarded for the same. Professors T.J. Pandian and A.J. Matty Award was selected from applicants below 35 years (40 years in the case of women), who preferably carried out work in India and has worked towards aquaculture

development through research. The award carried a cash prize of ₹15000, a medallion and an invitation to deliver keynote address in the forum. Dr. Rajesh Majhi of ICAR-DCFR was awarded with the award. Dr. M.C. Nandeesha Award was awarded to Shri Shivashankara, Udupi district, Karnataka for best innovation which has helped to improve productivity of the culture systems. The award carried a cash prize of ₹ 25000 and a citation. The applicants for the AFSIB Young Scientist award made presentations in the 13th IFAF and Dr. Santhana Kumar, ICAR-CIFRI, Dr. Subal Kumar Roul, ICAR-CMFRI, Dr. Rajesh M, ICAR-DCFR, Dr. Anirban Paul, ICAR-CIFA were the selected awardees.

Call for prestigious Shri. JVH Dixitulu National Award, which is a joint award by three scientific societies, for outstanding contributions in the field of fisheries extension was also made in connection with 13th IFAF. The award consists of a memento, a citation and a cash award of ₹30,000. The cash award is jointly sponsored by the Marine Biological Association of India, the Inland Fisheries Society of India and the Association of Aquaculturists. The award was presented to Dr. Bimal Kinkar Chand, Joint Director Research, WBUAFS, Kolkata in the inaugural ceremony of 13th IFAF.

IFSI Awards

Inland Fisheries Society of India (IFSI), a well-recognized scientific forum and one of the leading scientific societies in India, had announced call for five awards (Dr. Hiralal Choudhury Gold medal, Padmashri Dr. S. Ayyappan Gold medal, Dr. J.K. Jena Young Scientist Award, Prof A.P. Sharma Young Scientist Award, Dr. B.C. Jha Young Scientist Award) to be awarded during 13th IFAF. There was overwhelming response for the call and the selection of the IFSI awards involved both scoring based on

biodata as well as presentation of research work in the 13th IFAF.

More than 10 applications were received for Dr. Hiralal Choudhury Gold Medal Award for age group above 45 years, out of which 7 applicants presented their work for presentations. Prof. B. Manimaran and Dr. Madan Mohan acted as jury for the session and Dr. K. Pani Prasad, Principal Scientist, ICAR-CIFE, Mumbai was selected for the award.

For the Padma Shri Dr. S. Ayyappan Gold Medal Award called for the age group 35-45 years, eight applicants presented their work in the award selection session. Dr. Dilip Kumar and Dr. Utpal Bhowmick were jury in the session. The award was shared by Dr. Md. Shahbaz Akhtar, Scientist, ICAR-DCFR, Bhimtal and Dr.Satabdi Ganguly, Project Scientist, ICAR-CIFRI, Barrackpore.

There were three Young Scientist Awards reserved for age group below 35 years: Dr. J.K. Jena Young Scientist Award, Prof. A.P. Sharma Young Scientist Award, Dr. B.C. Jha Young Scientist Award. A total of 17 applications were shortlisted

and 12 applicants presented their worksin the 13th IFAF for award selection. Dr. Atul K. Singh and Dr. B.K. Bhattacharjya served as jury for the session. Dr. M. Shaya Devi, Scientist, ICAR-CIFRI and Dr. Shreya Bhattacharya, Project Scientist, ICAR-CIFRI were selected for Dr. J. K. Jena Young Scientist Award. Mr. Soibam Ngasotter, PhD scholar of ICAR-CIFE was selected for Prof. A.P.

Sharma Young Scientist Award and Dr. Subal Kumar Roul of ICAR-CMFRI was selected for Dr. B.C. Jha Young Scientist Award.

Conclaves

The Industry Conclave held on the second day of the 13th Inland Fisheries and Aquaculture Forum (IFAF) provided a platform for dialogue and collaboration among industries, research institutes, and line departments. Shri Sagar Mehra, Joint Secretary (Inland Fisheries), Department of Fisheries (DoF), Government of India, highlighted the urgent need for collaboration to support research, capacity building, and policy-making in the country. Such partnerships can drive innovation and ensure the maximum benefit from the fisheries and aquaculture sector.

During the conference's inauguration, Hon'ble Parshottam Rupalaji, Minister of Fisheries, Animal Husbandry and Dairying, Government of India, stressed the importance of strong linkages among industry, research, and government bodies. He called for a shared vision and approach to align the sector with sustainable development goals (SDGs) and the "Viksit Bharat@2047" vision of the Hon'ble Prime Minister of India. This aligns with the broader national objective of fostering a more sustainable, resilient, and thriving future for Indian fisheries and aquaculture.

The conclave was chaired by Dr. George Ninan, Director of ICAR-CIFT; Dr. L. N. Murthy, Chief Executive

(I/C) of the National Fisheries Development Board (NFDB); and Shri Amit Saraogi, Managing Director of M/S Anmol Feeds. Dr. B.K. Das, Convener of the 13th IFAF and Director of ICAR-CIFRI, highlighted the institute's achievements in supporting the sector.

Eleven industry representatives from various fields related to fisheries and aquaculture took part in the conclave and engaged in productive discussions. There was a consensus on the urgent need to establish standards to ensure the quality of inputs, such as seeds and feeds, without compromising farmers' income. This can contribute to the overall efficiency and sustainability of the sector.

Additionally, the conclave emphasized the need for more research efforts to standardize captive breeding, seed production, and culture of indigenous shrimp and high-value fishes. Participants also discussed technologies for hygienic dry fish production and the development of a value chain.

Another key point was the importance of an extensive campaign and the establishment of a National Fish Coordination Committee to promote domestic fish consumption, which can boost the sector's growth and support the country's nutritional needs. The conclave also called for policy support to encourage freshwater fish exports, which can provide new opportunities for the sector.

Genetic improvement for enhanced flesh quality of Pangasius was also discussed as a way to increase exports and competitiveness in international markets. Lastly, there was a call for integrating entrepreneurial skills into fisheries education to encourage graduates to pursue careers in business and industry.

Overall, the Industry Conclave underlined the importance of collaboration and standardization in advancing the fisheries and aquaculture sector. By working together, stakeholders can ensure a sustainable and prosperous future for the industry.

Women empowerment in fisheries

The conclave on Women Empowerment in Fisheries was held on the first day of the 13th IFAF. The session was chaired by Dr. Meena Kumari, Former DDG (Fisheries Science), and co-chaired by Dr. Kiran Dubey, Emeritus Scientist at ICAR-CIFE, Mumbai. This session provided a platform to highlight the crucial roles women play in the fisheries and aquaculture sector, as well as the need for

gender equality and women's empowerment to ensure the sector's sustainable future.

Dr. Nikita Gopal, Head of Division at ICAR-CIFT, delivered a lead talk on the topic of gender equity for a sustainable future in aquaculture and fisheries. She emphasized the importance of gender equality throughout the entire fisheries supply chain, from production and processing to marketing. Dr. Gopal discussed how women's roles in the sector are often underrepresented, despite their significant contributions. She called for recognition and support for women's integral participation in the sector.

Dr. Kiran Dubey briefed the audience on the diverse roles women play in society and the fisheries sector. She stressed the need to recognize the opportunity cost associated with women's work in fisheries and the importance of acknowledging their contributions. Dr. Dubey's remarks focused on the importance of providing women with fair access to economic gains from their work in the sector.

The panel discussion included insights from various experts and researchers on gender roles in fisheries and aquaculture. The panel emphasized the need for financial independence for women in the sector, ensuring that they have direct access to the economic benefits of their work. This empowerment is crucial for strengthening women's roles and mainstreaming their participation in fisheries.

The session also focused on opportunities for women to develop entrepreneurial skills in fisheries and the importance of creating women-friendly technologies. These measures can empower women to lead in various aspects of the sector.

The conclave agreed that gender mainstreaming requires gender-sensitive and socially inclusive policies and programs, as well as ongoing monitoring and evaluation. To achieve this, researchers and scientists were urged to integrate gender studies into their projects, ensuring a comprehensive approach.

The major recommendations of the conclave were:

- Allocation of Budgets: A certain percentage of institute budgets should be allocated towards gender research and the empowerment of women beneficiaries in the fisheries sector.
- Gender Studies in Academics: Courses on gender studies should be incorporated into academic curricula to promote a deeper understanding of gender dynamics in fisheries.
- Gender-Inclusive Research: Research projects should be designed to be gender-inclusive, promoting women's participation and opportunities in science.
- Leadership and Technical Skills: There is a need to develop leadership and technical skills for women stakeholders in fisheries to enhance their contributions and opportunities.

The conclave underscored the importance of supporting women's roles in fisheries through policy changes, research initiatives, and educational opportunities. By empowering women in the sector, the industry can achieve greater resilience and sustainable growth.

Farmers' Conclave

The Farmers' Conclave was a significant gathering held in Kolkata during the 13th IFAF. This conclave provided a unique platform for fishers and fish farmers from across the country to come together and engage in discussions about their experiences, challenges, and potential opportunities in the fisheries and aquaculture sectors.

The conclave was led by Dr. L.N. Murthy, Chief Executive of the National Fisheries Development Board (NFDB), Hyderabad, and coordinated by Dr. A.K. Das, Principal Scientist and Head at ICAR-CIFRI, and Dr. Dipesh Debnath, Senior Scientist at ICAR-CIFRI RC Guwahati. With over 300 farmers in attendance, the event fostered a vibrant exchange of knowledge and experiences.

In his opening remarks, Dr. Das initiated interaction with the farmers by inquiring about the problems they faced in fish culture and invited the farmers to share their concerns with the panel of experts present. The panel included notable figures such as Dr. L.N. Murthy, CE of NFDB; Dr. P.C. Das, Principal Scientist and Head at ICAR-CIFA, Bhubaneswar; Dr. T.K. Ghosal, Principal Scientist and Head at

ICAR-CIFE, Kolkata; Dr. M.A. Hassan, Former Head at ICAR-CIFRI, Barrackpore; Dr. H.N. Dwivedi, Director of Fisheries, Government of Jharkhand; and Mr. Kultoli from Milan Tirtha Society, Sunderbans, West Bengal.

The conclave provided farmers with insights into the various supports offered under the Pradhan Mantri Matsya Sampada Yojana (PMMSY) to modernize and strengthen the value chain, improve traceability, and establish a robust fisheries management framework, all while ensuring the socio-economic welfare of fishers and fish farmers.

During the conclave, a range of topics was discussed, including scientific fish culture methods, strategies to prevent diseases and macrophyte infestation in wetlands, effective feed and feeding management, and marketing strategies. Experts also shared information on the schemes offered by different government agencies, emphasizing the importance of collaborative efforts among fishers, government agencies, and industry players to promote the sustainable development of Indian fisheries.

The Farmers' Conclave underscored the importance of sharing knowledge and expertise among fishers and fish farmers, as well as the value of fostering collaboration to maximize the benefits of available resources and opportunities in the sector. This gathering provided a space for farmers to raise their voices, ask questions, and gain valuable insights from experts and peers, ultimately contributing to the sustainable and prosperous future of India's fisheries and aquaculture industry.

Department of Fisheries (DoF) Conclave

The Department of Fisheries (DoF) conclave was organized on the first day of the 13th IFAF, setting the stage for an insightful discussion on the challenges and opportunities faced by the fisheries sector in India. The increasing demand for fish, coupled with the hurdles experienced by fish

farmers and fishers, highlighted the need for innovative strategies, government support, and collaborative efforts to address the sector's needs.

The conclave served as a convergence point for a diverse group of stakeholders, including policymakers, experts, and farmers, who gathered to deliberate on approaches for enhancing fish production and productivity across the country. Dr. A.K. Das, Principal Scientist at ICAR-CIFRI, extended a warm welcome to the panel of experts, farmers, and extension and development officers present.

The event commenced with an overview of the numerous government schemes designed to boost fish production and support farmers, including the flagship Pradhan Mantri Matsya Sampada Yojana (PMMSY), which aims to achieve the "2nd Blue Revolution" through sustainable and responsible development of the fisheries sector in India.

Officials from State Fisheries Departments of Arunachal Pradesh, Jharkhand, Odisha, and West Bengal participated in the conclave, engaging in discussions with experts and sharing their perspectives. Dr. H.N. Dwivedi, Director of Fisheries for the Government of Jharkhand, spoke about research and development efforts for stock improvement in reservoir ecosystems, emphasizing cage aquaculture and the development of low-cost fish feed using locally sourced ingredients.

Dr. Dwivedi commended ICAR-CIFRI's initiatives in the reservoirs of Jharkhand through cage aquaculture and urged for stronger linkages between research institutes and state departments. This collaboration would provide farmers with greater access to technological support, leading to increased fish production and enhanced income opportunities.

Experts from various fields of fisheries contributed insights into different government schemes aimed at improving the welfare of fish farmers. More than 300 farmers participated in the program, benefiting from the discussions and knowledge shared.

The conclave was held under the overall leadership of Dr. B.K. Das, Convener of the 13th IFAF and Director of ICAR-CIFRI, Barrackpore. The exchanges of ideas and viewpoints during the event are expected to inspire and guide fish farmers across the nation, fostering a culture of innovation and entrepreneurship within the fisheries sector. Ultimately, these efforts aim to drive sustainable development and prosperity for all stakeholders involved.

Student Interface Meet

The Student Interface Meet was organized on the first day of the 13th Indian Fisheries and Aquaculture Forum (IFAF) to provide a platform for interaction between experienced professionals and aspiring fishery students. The session aimed to guide and mentor students in their academic and professional pursuits. The meet was chaired by Prof. Manimaran Baskaran, former Vice Chancellor of TNJFU; Dr. Iddya Karunasagar, Research Advisor at NITTE University, Mangalore; and Dr. S.D. Singh, former ADG, ICAR. The panelists for the session included Dr. R.K. Trivedi, Professor at WBUAFS, Kolkata; Dr. S.K. Majhi, Head of ICAR-CIFRI, Regional Centre, Guwahati; and Dr. S.K. Udgata, Dean of the College of Fisheries, Odisha.

Prof. Manimaran began the session with his opening remarks, emphasizing the importance of entrepreneurship and innovation in today's world. He encouraged students to think beyond traditional career paths and explore opportunities in start-ups, clean technology, climate technology, and precision farming. He stressed the significance of creating new ventures and fostering a culture of innovation within the fisheries sector.

Dr. Karunasagar spoke about the numerous opportunities available in the fisheries sector and urged students to consider becoming job providers rather than job seekers. He highlighted potential funding sources that students can access to support their innovative projects and endeavors.

Dr. S.D. Singh addressed the need for willpower and self-confidence among students. He provided an overview of the job opportunities available in India's

fisheries sector and abroad, encouraging students to explore diverse career paths and strive for excellence.

Dr. S.K. Udgata gave a detailed presentation on the key features of the ICAR 6th Dean's Committee recommendations in relation to the New Education Policy (NEP) 2020 and its application in Fisheries Science. He discussed the potential implications of these recommendations and how they could shape the future of fisheries education.

Professor R.K. Trivedi emphasized the importance of discussing and adopting the NEP in Fisheries Science. He advocated for reforms and updates to the curriculum to better align with modern educational standards and industry needs.

Dr. S.K. Majhi echoed the importance of providing students with thorough training and the necessary tools to succeed in the fisheries sector. Dr. J.K. Jena, DDG of Fisheries Science, also participated in the meet and addressed students' questions about the NEP, ARS, and other related topics.

The major recommendations that emerged from the conclave were:

1. Initiation of necessary measures for the formation of the Fishery Council of India.
2. Detailed discussions and reviews on the adoption of the New Education Policy in Fisheries Science, with an emphasis on making necessary reforms.
3. Encouragement and support for start-ups and innovations within the fisheries sector.

These recommendations aim to empower students and guide them towards a successful future in fisheries science and related fields. By fostering an environment of innovation and entrepreneurship, the fisheries sector can continue to grow and evolve.

Expo

The expo organized at 13thIFAF was a resounding success showcasing a vibrant convergence of more than 45 exhibit stalls by industry leaders, researchers, and stakeholders from across the nation. The exhibition stalls at the event featured a comprehensive representation of the fisheries and aquaculture ecosystem, with participants ranging from ICAR institutes, SAUs, College of Fisheries, Department of Fisheries to private enterprises including Aqua Doctor Solutions, Himedia Laboratories Pvt. Ltd., Rameswara Group Enterprise, Zymogen Nutrients, ZEISS, Biostadt India Ltd., Das &Kumars, ABIS Fish Feeds, Glaucus Agrochem Pvt. Ltd., Anmol Feeds, and Basic Technology Private Limited, etc.

In addition to industry players, the exhibition also welcomed participation of national agencies such as Marine Product Export Development Authority, NFDB, publishing houses like New India Publishing Agency (NIPA), and banks including the State Bank of India and the National Bank for Agricultural & Rural

Development. This diverse gathering not only showcased the latest technological advancements, products, and services in the fisheries and aquaculture sectors but also facilitated valuable networking opportunities and knowledge exchange crucial for driving sustainable growth and development in the industry. Recognition of ICAR-CIFRI and ICAR-CIFE with the best stall awards in the Institute category further underlines the event's significance in promoting excellence and innovation, while accolades for participants like Glaucus Agrochem, Das & Kumar, and the Department of Fisheries highlight the outstanding contributions and commitment to excellence displayed at the expo.

List of Exhibition Stalls of 13 IFAF, 2024

No.	Organization
1	ICAR-Central Inland Fisheries Research Institute
2	ICAR-Central Marine Fisheries Research Institute
3	ICAR- Central Institute of Brackishwater Aquaculture
4	ICAR- Central Institute of Freshwater Aquaculture
5	ICAR- Central Institute of Fisheries Education
6	ICAR -Central Institute of Fisheries Technology
7	ICAR –National Bureau of Fish Genetic Resources
8	ICAR- Directorate of Coldwater Fisheries Research
9	ICAR- Indian Institute of Agricultural Biotechnology, Ranchi
10	ICAR-Central Research Institute for Jute & Allied Fibres
11	ICAR-National Institute of Natural Fibre Engineering & Technology
12	ICAR-ATARI, Kolkata
13	ICAR-ATARI, Barapani
14	ICAR-ATARI, Guwahati
15	Inland Fisheries Society of India (IFSI)
16	AFSIB
17	National Mission for Clean Ganga, Ministry of Jalshakti, ICAR-CIFRI, Barrackpore

18	ICAR-Research Complex for Eastern Region, Patna
19	Department of Agriculture, Animal Husbandry & Cooperative (Fisheries Division), Directorate of Fisheries, Jharkhand
20	Department of Fisheries, Govt. of Odisha
21	Department of Fisheries, Govt. of West Bengal
22	Department of Fisheries, Govt. of Arunachal Pradesh
23	Department of Fisheries, Govt. of Himachal Pradesh
24	National Fisheries Development Board, Hyderabad
25	National Bank for Agricultural & Rural Development
26	Marine Product Export Development Authority
27	Damodar Valley Corporation
28	State Bank of India
29	Bay of Bengal Programme
30	College of Fisheries, CAU, Tripura
31	Techno Global University, Tripura
32	Indian Association of Hill Farming
33	MR Aquatech, Bhubaneswar
34	Glaucus Agrochem Pvt. Ltd.
35	Das &Kumars
36	ABIS Fish Feeds
37	Anmol Feeds
38	Basic Technology Private Limited (btpl)
39	Vetbiotics Animal Healthcare Pvt. Ltd.
40	Zymogen Nutrients
41	ZEISS
42	Biostadt India Ltd.

43 New India Publishing Agency (NIPA), New Delhi

44 Aqua Doctor Solutions

45 Himedia Laboratories Pvt. Ltd.

46 Rameswara Group Enterprise

Program Launch Workshop of the BIMSTEC-India Marine Research Network (BIMReN)

The Program Launch Workshop of the BIMSTEC-India Marine Research Network (BIMReN) was held on 23 February 2024 alongside the 13th IFAF sessions. The event marked a significant step towards regional cooperation for achieving Sustainable Development Goals (SDGs). Dr. C.N. Ravishankar, Director, ICAR-CIFE welcomed the participants and explained the importance of regional cooperation in the field of marine science. He also recalled the genesis of BIMReN. Amb. C.S.R. Ram, Joint Secretary (BIMSTEC & SAARC), Ministry of External Affairs, Government of India, briefed various initiatives of MEA in promoting cooperation among the BIMSTEC countries and BIMReN will be a major tool in promoting regional cooperation in the field of blue economy and marine sciences. Dr. P. Krishnan, Director, BOBP-IGO, Chennai, gave an overview of components of the BIMReN- Split site PhD fellowship and Twinning Research project. The memorandum of

understanding (MoU) between the Ministry of External Affairs-India (MEA) and BOBP-IGO was signed in the occasion. Dr. J.K. Jena, DDG (FY. Sc.), ICAR highlighted India's prowess in the field and explained how BIMReN offers possibilities for networking and collaborating among researchers within and outside India, in the field of Marine Science. Senior researchers, academicians and heads of institutions participated in the launch workshop. The delegates welcomed and complemented BOBP-IGO and MEA for the initiative.

Plenary & Valedictory Session

The plenary-cum-valedictory program of the 13th Indian Fisheries and Aquaculture Forum (IFAF) was a significant and memorable event, marked by the presence of esteemed dignitaries and experts in the field of fisheries and aquaculture. Distinguished personalities such as Dr. J.K. Jena, DDG (Fisheries Science), ICAR, New Delhi; Dr. Ravisankar C.N., Director and Vice-Chancellor, ICAR-CIFE, Mumbai; Dr. Dilip Kumar, Former Vice-Chancellor, ICAR-CIFE, Mumbai; Dr. B. Meena Kumari, Former DDG (Fisheries Science), ICAR, New Delhi, and Former Chair, National Biodiversity Authority; Dr. B.K. Das, Director, ICAR-CIFRI, Barrackpore; and Dr. A.K. Das, Principal Scientist and Secretary of the Inland Fisheries Society of India graced the occasion with their presence.

Dr. B.K. Das delivered a comprehensive summary of the major recommendations and key takeaways from all the sessions held during the forum. His briefing provided an overview of the various discussions, findings, and proposals that emerged during the event, highlighting the progress and future directions for the fisheries and aquaculture sector in India.

Dr. J.K. Jena extended his heartfelt congratulations to Team ICAR-CIFRI for orchestrating such a successful forum. He acknowledged the forward-thinking scientific advancements and innovative approaches in the fisheries and aquaculture sector that were showcased throughout the event. Dr. Jena urged all stakeholders to continue working towards transforming the fisheries sector, embracing new challenges and opportunities for future growth.

During the valedictory ceremony, numerous awards were presented to recognize outstanding achievements in the industry. This included the AFSIB, IFSI, and industry awards, along with a total of 33 best oral presentation awards and 41 best poster presentation awards. These awards honored the exceptional contributions of the recipients and underscored the high caliber of work and research being conducted in the field.

Dr. A.K. Das, Secretary of IFSI, proposed a formal vote of thanks, expressing his deep appreciation to the leading figures and pioneers in the fisheries sector for their invaluable guidance and support. He emphasized the significance of the forum's successful conclusion, which was made possible by the enthusiasm and dedication of all the delegates.

The valedictory session marked the culmination of the 13th IFAF, with the attendees leaving with a sense of accomplishment and motivation. The forum offered participants a remarkable platform to enhance their knowledge, gain insight into the latest developments, and engage with other researchers in their field. Through active participation and valuable interactions, the event fostered a spirit of collaboration and innovation that will undoubtedly drive future advancements in the fisheries and aquaculture sector.

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"Fish is the Ultimate stakeholder in fisheries sector"- Union Fisheries Minister Shri Parshottam Rupala

Kolkata,(KCN): Hon'ble Parshottam Rupala Ji, Minister of Fisheries, Animal Husbandry and Dairying, Government of India, urged all stakeholders including researchers, government officials, farmers, industry representatives, civil society organizations, and students to unite in the country's efforts towards increasing production and maintaining sustainability in fisheries and aquaculture sector. He was delivering his inaugural address of 13th Indian Fisheries and Aquaculture Forum (23-25 February 2024) organized by ICAR - Central Inland Fisheries Research Institute (ICAR-CIFRI) in collaboration with the Asian Fisheries Society Indian Branch (AFSIB), Inland Fisheries Society of India (IFSI), and the Professional Fisheries Graduates Forum (PFGF), here at Kolkata today. He hoped that this forum will pave the way for a brighter, more resilient future for Indian fisheries and aquaculture, aligning with sustainable development goals (SDGs) and the vision "Viksit Bharat@2047" of Hon'ble Prime Minister of India. The minster reminded the gathering that recognizing the importance of this sunrise sector; concerted efforts are underway to harness its potential through effective management, enhancing productivity, technological interventions, infrastructure development, strengthening value chains, and robust governance as prioritized in the Prime Minister's Matsya Sampada Yojana (PMMSY).

He expressed satisfaction over India's

contribution to global fish production and agricultural GDP of the country, and substantial foreign exchange generation to the tune of Rs. 63,969 crores through exports of fish and related products every year. The Minister made a few key advices such as future research should be based on fishers' need; there should be an apex forum for scientific communities; technologies to reduce post-harvest losses; smart and digital marketing with catchy slogans; utilisation of "Amrit Sarovar" for fish culture; establishing Matsya Vikas Kendras (MVKs) in the country. He hoped this conference will provide a platform to all the stakeholders to exchange their ideas for fostering Indian fisheries and aquaculture towards sustainable development goals for enhancing fish production and framer's income. Dr. Himanshu Pathak, Secretary Dept. of Agriculture Research and Education (DARE) and Director General (DG), ICAR, earlier in his address emphazied that towards "Viksit Bharat" from "Vikassheel Bharat", fisheries and aquaculture sector from its fast and sustainable growth rate of 10 % will play a major role. He stressed on nature-friendly, climate resilient and profit making fisheries sector with introduction of genetically improved species, smart and precise practices, proper regulatory mechanism and skill development. Dr. Joykrushna Jena, Deputy Director General (Fishery Science), ICAR, while elaborating on pollution free, sustainable and profitable fisheries, its unrealized potential and future opportunities of contribution national economy. He urged upon judicious and amicable sharing of resources among the sectors in agriculture for higher production with a pragmatic roadmap for the Amritkaal.

Dr. Basanta Kumar Das, Director, ICAR-CIFRI and the convener of the conference earlier in his remark outlined the total of the three days vast programme and informed the house that besides the scientific discussions on progress made and future plans, the conference will also include special lectures, industry, fisheries officials and farmers' conclaves, satellite symposia, student corner and technology exhibition to discuss on issues like climate change, natural farming, gender equality, women empowerment, social upliftment, employment opportunities for the youth in the fisheries sector.

On this occasion various awards of national importance such as Prof. HPC Shetty Award, Professors T. J. Pandian & A. J. Matty Award, Dr. TVR Pillai Award, Dr. M. C. Nandeesha Award, Shri J.V.H. Dixitulu National Award, IFSI fellows and AFSIB Young Scientist Awards and awards to industrial partners were presented by the Hon'ble minister. The contributions of the award winning scientists in their respective fields will certainly motivate the young minds and set new standards for them to follow in future to do more for the fisheries and aquaculture sectors. About 1500 delegates from India and abroad including Galaxy of Scientists, Entrepreneurs including Women Entrepreneurs, Fishers and Fish farmers, Scholars, Government Officials, Industrialists and Students attended the programme.

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ଭାରତୀୟ ମତ୍ସ୍ୟ ଏବଂ ଜଳଚର ଫୋରମ୍‌ର ଉଦ୍‌ଘାଟନୀ ଉତ୍ସବ

ମତ୍ସ୍ୟଜୀବୀଙ୍କୁ ପ୍ରୋତ୍ସାହିତ କରିବ ସମ୍ମିଳନୀ

କୋଇଜାତା,୨୩।୨(ଆପ୍): ଭାରତ ସରକାର ମତ୍ସ୍ୟ, ପଶୁପାଳନ ଏବଂ ଦୁଗ୍ଧ ମନ୍ତ୍ରୀ ମାନ୍ୟବର ପରଷୋତ୍ତମ ରୁପାଲା ଉତ୍ସାଦନ ବୃଦ୍ଧି ଦିଗରେ ଦେଶର ଉଦ୍ୟମରେ ଅନୁସନ୍ଧାନକାରୀ, ସରକାରୀ କର୍ମଚାରୀ, କୃଷକ, ଶିଳ୍ପ ପ୍ରତିନିଧି, ନାଗରିକ ସମାଜ ସଂଗଠନ ଏବଂ ଛାତ୍ରଛାତ୍ରୀମାନଙ୍କୁ ଏଜୁଟ୍ ହେବାକୁ ଅନୁରୋଧ କରିଛନ୍ତି। ମତ୍ସ୍ୟ ଏବଂ ଜଳଚର କ୍ଷେତ୍ରରେ ସ୍ଥିରତା ବଜାୟ ରଖିବା ନେଇ ସେ ଏସୀୟ ମତ୍ସ୍ୟ ସମାଜ ସୋସାଇଟି ଇଣ୍ଡିଆନ୍ ଶାଖା (ଏଏଫ୍‌ଏସ୍‌ଆଇବି) ସହଯୋଗରେ ଆଇସିଏଆର-ସେଣ୍ଟ୍ରାଲ ଆଭ୍ୟନ୍ତରୀଣ ମତ୍ସ୍ୟ ଅନୁସନ୍ଧାନ ପ୍ରତିଷ୍ଠାନ (ଆଇସିଏଆର-ସିଫ୍ରି) ଦ୍ୱାରା ଆୟୋଜିତ ୧୩ ତମ ଭାରତୀୟ ମତ୍ସ୍ୟ ଏବଂ ଜଳଚର ଫୋରମ୍ (୨୩-୨୫ ଫେବ୍ରୁଆରୀ ୨୦୨୪) ର ଉଦ୍‌ଘାଟନୀ ଉତ୍ସବରେ ଭାଷଣ ପ୍ରଦାନ କରିଥିଲେ। ମତ୍ସ୍ୟ ସମାଜ ଆଜି କୋଲକାତାରେ (ଆଇଏଫ୍‌ଏସ୍‌ଆଇ) ଏବଂ ପ୍ରଫେସନାଲ ଫିସିରି ଗ୍ରାଜୁଏଟ

ଫୋରମ୍ (ପିଏଫ୍‌ଜିଏଫ୍) ସ୍ଥାୟୀ ବିକାଶ ଲକ୍ଷ୍ୟ (ଏସ୍‌ଡିଜିଏସ୍) ଏବଂ ମାନ୍ୟବର ପ୍ରଧାନମନ୍ତ୍ରୀଙ୍କ ବିକାଶ ଭାରତ ୬ ୨୦୪୭ ଅନୁଯାୟୀ ଏହି ପ୍ଲାଟଫର୍ମ ଭାରତୀୟ ମତ୍ସ୍ୟ ଏବଂ ଜଳଚର ପାଇଁ ଏକ ଉଜ୍ଜ୍ୱଳ, ଅଧିକ ସ୍ଥିର ଭବିଷ୍ୟତ ପାଇଁ ବାଟ ଖୋଲିବ ବୋଲି ସେ ଆଶା ପ୍ରକଟ କରିଛନ୍ତି। ମତ୍ସ୍ୟ ଉତ୍ପାଦନ ଏବଂ କୃଷକଙ୍କ ଆୟ ବଢାଇବା ପାଇଁ ଭାରତୀୟ ମତ୍ସ୍ୟଜୀବୀ ତଥା ଜଳଚର କୃଷିକୁ ନିରନ୍ତର ବିକାଶ ଲକ୍ଷ୍ୟ ଦିଗରେ ପ୍ରୋତ୍ସାହିତ କରିବା ପାଇଁ ଏହି ସମ୍ମିଳନୀ ସମସ୍ତ ହିତାଧିକାରୀଙ୍କୁ ଏକ ପ୍ଲାଟଫର୍ମ ପ୍ରଦାନ କରିବ ବୋଲି ସେ ଆଶା ପ୍ରକଟ କରିଛନ୍ତି।

ଏହାପୂର୍ବରୁ କୃଷି ଅନୁସନ୍ଧାନ ଏବଂ ଶିକ୍ଷା ବିଭାଗ (ଡିଆରଏ) ଏବଂ ମହାନିର୍ଦ୍ଦେଶକ (ଡିଜି) ଆଇ.ସି.ଏ.ର ଡକ୍ଟର ହିମାଂଶୁ ପାଠକ କହିଛନ୍ତି, ମତ୍ସ୍ୟ ଓ ଜଳଚର କ୍ଷେତ୍ର ବିଭାଖଶୀଳ ଭାରତରୁ ବିକଶିତ ଭାରତକୁ ଯିବା ଆବଶ୍ୟକ। ୧୦% ର ସ୍ଥାୟୀ ଅଭିବୃଦ୍ଧି ହାର ଏକ ପ୍ରମୁଖ ଭୂମିକା ଗ୍ରହଣ କରିବ। ଡେପୁଟି ଡାଇରେକ୍ଟର ଜେନେରାଲ୍ (ମତ୍ସ୍ୟ ବିଜ୍ଞାନ) ଡକ୍ଟର ଜୟକୃଷ୍ଣ ଜେନା ପ୍ରଦୂଷଣମୁକ୍ତ, ନିରନ୍ତର ଏବଂ ଲାଭଜନକ ମତ୍ସ୍ୟ ଉତ୍ପାଦନ ପାଇଁ ଭବିଷ୍ୟତର ସୁଯୋଗ, ଏହାର ଅବାସ୍ତବ ସମ୍ଭାବନା ଏବଂ ଜାତୀୟ ଅର୍ଥନୀତିରେ ଅବଦାନ ବିଷୟରେ ବିସ୍ତୃତ ଭାବରେ ଆଲୋଚନା କରିଥିଲେ। ଆଇସିଏଆର-ସିଫ୍ରି ଏବଂ ସମ୍ମିଳନୀର କନଭେନର୍ ଡକ୍ଟର ବସନ୍ତ କୁମାର ଦାସ ତାଙ୍କର ପୂର୍ବ ବକ୍ତବ୍ୟରେ ମେଗା ତିନି ଦିନିଆ କାର୍ଯ୍ୟକ୍ରମର ବାହ୍ୟରେଖା ଉପସ୍ଥାପନ କରିଥିଲେ। ଏହି ଅବସରରେ ପ୍ରଫେସର ଏଚ୍.ପି.ସି ଶେଟି ପୁରସ୍କାର, ପ୍ରଫେସର ଟି ପାଣ୍ଡିଆନ୍ ଏବଂ ଏ ମ୍ୟାଟି ପୁରସ୍କାର, ଡକ୍ଟର ଟିଭିଆର ପିଲ୍ଲାଇ, ଡଃ ନନ୍ଦିଶା ପୁରସ୍କାର, ଶ୍ରୀ ଜେ.ଭି. ମାନ୍ୟବର ମନ୍ତ୍ରୀଙ୍କ ଦ୍ୱାରା ବିଶ୍ୱଦ୍ରୁଲ୍ଲ ଜାତୀୟ ପୁରସ୍କାର, ଆଇଏଫ୍‌ଏସ୍‌ଆଇ ଏବଂ ଏଏଫ୍‌ଏସ୍‌ଆଇବି ଯୁବ ବୈଜ୍ଞାନିକ ପୁରସ୍କାର ଏବଂ ଶିଳ୍ପ ଭାଗୀଦାରଙ୍କୁ ପୁରସ୍କାର ପ୍ରଦାନ କରାଯାଇଥିଲା। ଏହି କାର୍ଯ୍ୟକ୍ରମରେ ଗାଲାକ୍ସି ଅଫ୍ ସାଇଣ୍ଟିଷ୍ଟ, ମହିଳା ଉଦ୍ୟୋଗୀ, ମତ୍ସ୍ୟଜୀବୀ ଏବଂ ମତ୍ସ୍ୟ କୃଷକ, ପଣ୍ଡିତ, ସରକାରୀ କର୍ମଚାରୀ, ଶିଳ୍ପପତି ଏବଂ ଛାତ୍ର ସମେତ ଭାରତ ତଥା ବିଦେଶର ପ୍ରାୟ ୧୫୦୦ ପ୍ରତିନିଧି ଯୋଗ ଦେଇଥିଲେ।

এই সময়
সংবাদপত্র

এই দেশ
ছেলেকে হারিয়ে আইভিএফের পথে সিধু মুসেওয়ালার মা

এই দেশ
পতঞ্জলির কিছু বিজ্ঞাপন বন্ধের নির্দেশ শীর্ষ কোর্টের

দুর্ঘটনায় মৃত্যুতে মৎস্যজীবীরা ৫ লক্ষ টাকা ক্ষতিপূরণ পাবেন

‘ইন্ডিয়ান ফিশারিজ় অ্যান্ড অ্যাকোয়া কালচারাল ফোরাম’-এ ঘোষণা মন্ত্রীর

এই সময়: আগামী দিনে কৃষি এবং মৎস্যচাষ গবেষণায় কোন বিষয়ে সবাধিক গুরুত্ব দেওয়া উচিত? বিজ্ঞানীদের মতে, জলবায়ু প্রতিনিয়ত বদলাচ্ছে। তাই এই বিষয়েই সবচেয়ে বেশি জোর দেওয়া উচিত। কেন্দ্রীয় মৎস্য-পশুপালন এবং ডেয়ারি মন্ত্রী পরশোত্তম রূপালাও জানালেন সে কথাই।

গত ২৩ ফেব্রুয়ারি নিউ টাউনের বিশ্ব বাংলা কনভেনশন সেন্টারে ১৩তম ‘ইন্ডিয়ান ফিশারিজ় অ্যান্ড অ্যাকোয়া কালচারাল ফোরাম’-এর উদ্বোধনী অনুষ্ঠানে উপস্থিত ছিলেন তিনি। সেখানে ওই বক্তব্য জানানোর পাশাপাশি মন্ত্রী ঘোষণা করেন, দুর্ঘটনায় মৎস্যজীবীদের মৃত্যুতে ক্ষতিপূরণের অঙ্ক ১ লক্ষ থেকে বাড়িয়ে ৫ লক্ষ টাকা করা হলো। সম্মেলন শেষ হয় ২৫ ফেব্রুয়ারি।

রূপালা জানান, মৎস্যজীবীদের জন্য বিভিন্ন বিমা প্রকল্প চালু করতেও উদ্যোগী হয়েছে কেন্দ্র। ভবিষ্যতে এঁদের জন্যও কিষান ক্রেডিট কার্ডের মতো ক্রেডিট কার্ড চালু হবে। দেশে বর্তমানে ৩ কোটি মৎস্যজীবী পরিবার আছে। মাছ রপ্তানির মোট মূল্য এখন ৬০ হাজার কোটি টাকা। সরকার তা ১ লক্ষ কোটিতে নিয়ে যাওয়ার লক্ষ্যমাত্রা স্থির করেছে। তিনি আরও জানান, ২০১৪-র পর মৎস্য ও সংশ্লিষ্ট ক্ষেত্রে ৩৮ হাজার কোটি টাকা বরাদ্দ করেছে কেন্দ্র। স্বাধীনতার পর থেকে ২০১৪-র আগে পর্যন্ত এ ক্ষেত্রে ৩ লক্ষ ৬৮০ কোটি টাকা বরাদ্দ ছিল বলে তাঁর দাবি। আইসিএআর-সিআইএফআরআইয়েএর অধিকর্তা তথা সম্মেলনের আহ্বায়ক বসন্ত কুমার দাস, ফোরামের উদ্দেশ্য ও রূপরেখা ব্যাখ্যা করেন। জলবায়ু পরিবর্তন, প্রাকৃতিক চাষ, লিঙ্গ সমতা, নারীর ক্ষমতায়ন, সামাজিক উন্নয়ন, মৎস্য চাষে যুবকদের কর্মসংস্থানের সুযোগ তৈরি নিয়ে আলোচনা করেন বিজ্ঞানীরা। জানানো হয়, ‘প্রধানমন্ত্রী মৎস্য সম্পদ যোজনা’-র মতো প্রকল্পকে আরও ছড়িয়ে দেওয়া হবে। এর মাধ্যমে মৎস্য চাষের সম্ভাবনাকে কাজে লাগাতে নানা পরিকল্পনা করা হচ্ছে।

ସମାଜ
The Samaja
ପ୍ରତିଷ୍ଠାମ-ଭୁବନମଣି ଗୋବିନ୍ଦଚନ୍ଦ୍ର ଗ୍ରନ୍ଥ
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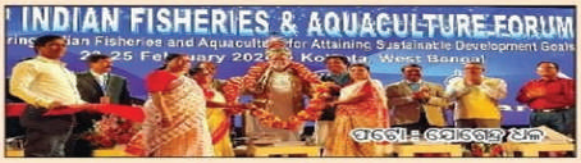
ମତ୍ସ୍ୟ ଚାଷ ଓ ଉତ୍ପାଦନ ବୃଦ୍ଧି ପ୍ରସଙ୍ଗ

ଦ୍ୱିତୀୟ ବିପ୍ଳବର ଆବଶ୍ୟକତା ରହିଛି : କେନ୍ଦ୍ରମନ୍ତ୍ରୀ ରୂପାଲା



ଫଟୋ : ଯୋଗେନ୍ଦ୍ର ଧଳ

କଲିକତା, ୨୩।୨ (ନି.ପ୍ର): ସାଂପ୍ରତିକ ପରିବେଶରେ କ୍ରମବର୍ଦ୍ଧମାନ ମାଙ୍କର ଚାହିଦାକୁ ଦ୍ୱିତୀୟ ନୀଳ ବିପ୍ଳବର ଆବଶ୍ୟକତା ରହିଛି ବୋଲି କେନ୍ଦ୍ର ମନ୍ତ୍ରୀ ପୁରୁଷୋତ୍ତମ ରୂପାଲା କଲିକାତାଠାରେ କହିଛନ୍ତି। ଆଜି ବିଶ୍ୱବଙ୍ଗଳା କନ୍‌ଭେନ୍‌ସନ ହଲ୍‌ଠାରେ ଅନୁଷ୍ଠିତ ଇଣ୍ଡିଆନ୍ ଫିସରିଜ୍ ଆଣ୍ଡ ଅକ୍ୱା କଲ୍‌ଚର ଫୋରମ୍‌ର ତିନି ଦିନିଆ ସମ୍ମିଳନୀକୁ କେନ୍ଦ୍ରମନ୍ତ୍ରୀ ଶ୍ରୀ ରୂପାଲା ଆନୁଷ୍ଠାନିକ ଭାବେ ଉଦ୍‌ଘାଟନ କରି କହିଥିଲେ ଯେ ବିକଶିତ ଭାରତ ପାଇଁ ଅଧିକ ମତ୍ସ୍ୟଉତ୍ପାଦନର ଆବଶ୍ୟକତା ରହିଛି। ବିଶେଷ କରି ମତ୍ସ୍ୟ ଉତ୍ପାଦନ ବୃଦ୍ଧି, ଜଳଚର କ୍ଷେତ୍ରରେ ସ୍ଥିରତା ବଜାୟ ରଖିବାକୁ ପଡ଼ିବ। ଫଳରେ ଗବେଷକ, ସରକାରୀ ଅଧିକାରୀ ଓ ସମସ୍ତ ହିତାଧିକାରୀ ଏହି କ୍ଷେତ୍ରରେ ଗୁରୁତ୍ୱପୂର୍ଣ୍ଣ ଭୂମିକା ପାଳନ କରିବାର ଆବଶ୍ୟକତା ରହିଛି। ଯାହାଦ୍ୱାରା ପ୍ରଧାନମନ୍ତ୍ରୀଙ୍କ ସବ୍‌କା ବିକାଶ, ସବ୍‌କା ପ୍ରୟାସ ଆହ୍ୱାନ ସଫଳ ହେବ। ମନ୍ତ୍ରୀଙ୍କ ବକ୍ତବ୍ୟ ଥିଲା ଯେ ବିଶ୍ୱ ମତ୍ସ୍ୟ ଉତ୍ପାଦନ ଏବଂ ଦେଶର କୃଷି ଜିଡ଼ିପିରେ ଭାରତର ଯୋଗଦାନ ଅତ୍ୟନ୍ତ ଗୁରୁତ୍ୱପୂର୍ଣ୍ଣ। ପ୍ରତିବର୍ଷ ମାଛ ଏବଂ ଆନୁସଙ୍ଗିକ ଦ୍ରବ୍ୟ ରପ୍ତାନୀ ମାଧ୍ୟମରେ ୬୩ହଜାର ୯୬ ଟଙ୍କାରୁ ଟଙ୍କା ବିଦେଶୀ ମୁଦ୍ରା ଆୟ ହେଉଛି, ଯାହାକି ସନ୍ତୋଷଜନକ ବିଷୟ। ସେ ଆହୁରି କହିଥିଲେ ଯେ ଏହି କ୍ଷେତ୍ରରେ ଅତୁଳନୀୟ ସମ୍ପଦସାରଣର ଭିତ୍ତିଭୂମି ତିଆରି କରିବାକୁ ହେବ। ସେଥିପାଇଁ ମତ୍ସ୍ୟଜୀବୀ, ହିତାଧିକାରୀ, କୃଷକ, ଅନୁସନ୍ଧାନକାରୀ, ଗବେଷକ ଏବଂ ଉଦ୍ଭୋକ୍ତାଙ୍କ ଭୂମିକା ଗୁରୁତ୍ୱପୂର୍ଣ୍ଣ। ଯାହାଦ୍ୱାରା ଏହି କାର୍ଯ୍ୟ ସମ୍ପନ୍ନ ହୋଇପାରିବ। ତିନି ଦିନିଆ ସମ୍ମିଳନୀରେ କେନ୍ଦ୍ରୀୟ ଅନ୍ତସ୍ଥଳୀୟ ମତ୍ସ୍ୟ ଅନୁସନ୍ଧାନ ପ୍ରତିଷ୍ଠାନର ନିର୍ଦ୍ଦେଶକ ତଥା ସମ୍ମିଳନୀର ଆବାହକ ଡକ୍ଟର ବସନ୍ତ କୁମାର ଦାସ କହିଥିଲେ ଯେ ମତ୍ସ୍ୟ ସମ୍ପଦ କ୍ଷେତ୍ରର ପ୍ରଗତି ପାଇଁ ବହୁବିଧ ଯୋଜନା ପ୍ରଣୟନ କରାଯାଉଛି। ଯାହାକୁ ବାସ୍ତବ ରୂପ ଦେବା କ୍ଷେତ୍ରରେ ବିଭିନ୍ନ ପ୍ରକାର ଉଦ୍ୟମ ଗ୍ରହଣ କରାଯାଇଛି। ଫଳରେ ମତ୍ସ୍ୟ ପ୍ରଜନନ ଓ ଉତ୍ପାଦନର ଲକ୍ଷ୍ୟ ପରିପୂରଣ ହୋଇଛି। ଏହି କ୍ଷେତ୍ରରେ ଆଇସିଏଆର୍, ସିଫ୍ରି, ଏସିଆନ୍ ମତ୍ସ୍ୟ ସମାଜ, ଭାରତୀୟ ଅନ୍ତସ୍ଥଳୀୟ ମତ୍ସ୍ୟ ସମାଜ, ପ୍ରଫେସନାଲ ଫିସରିଜ୍ ଫୋରମ୍‌ର ମିଳିତ ଉଦ୍ୟମ ରହିଛି। କାର୍ଯ୍ୟତଃ ଅନୁଷ୍ଠିତ ସମ୍ମିଳନୀରେ ପ୍ରଧାନମନ୍ତ୍ରୀଙ୍କ ବିକଶିତ ଭାରତର ଅନୁରୂପକୁ ପ୍ରତିଟି ସ୍ତରରେ ପହଞ୍ଚାଇବା ପାଇଁ ବିଶେଷ ସହାୟକ ହେବ। ଏହି ସମ୍ମିଳନୀରେ କୃଷକ, ମତ୍ସ୍ୟଜୀବୀ ଏବଂ ଗବେଷକ ଓ ଅଧିକାରୀମାନେ ଉପସ୍ଥିତ ଥିଲେ। ଭାରତୀୟ କୃଷି ଅନୁସନ୍ଧାନ ଓ ଶିକ୍ଷା ବିଭାଗ ମହା ନିର୍ଦ୍ଦେଶକ ଡକ୍ଟର ହିମାଂଶୁ ପାଠକଙ୍କ ସମେତ ଆଇସିଏଆର୍ ଉପ ମହାନିର୍ଦ୍ଦେଶକ ଡକ୍ଟର ଜୟକୃଷ୍ଣ ଜେନା, ଡକ୍ଟର ସି ରବିଶଙ୍କର, ଡକ୍ଟର ଅର୍ଚ୍ଚନ ଦାସ, ଡକ୍ଟର ଏକେ ଦାସ ପ୍ରମୁଖ ବକ୍ତବ୍ୟ ରଖିଥିଲେ। ଏହି ଅବସରରେ ବିଭିନ୍ନ ପୁରସ୍କାର ପ୍ରଦାନ କରାଯାଇଥିଲା। ପ୍ରଫେସର ଏଚ୍‌ପିସି ସେଟ୍ଟି ପୁରସ୍କାର, ଡକ୍ଟର ପିଡିଆର୍ ପିଲାଇ ପୁରସ୍କାର ପ୍ରଦାନ କରାଯାଇଥିଲା। ପ୍ରାୟ ୧୭ଶହ ପ୍ରତିନିଧି ଏହି କାର୍ଯ୍ୟକ୍ରମରେ ଯୋଗ ଦେଇଥିଲେ।

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Students got the roadmap for future job and career opportunities in fisheries and aquaculture sector on 13th IFAF Student Interface Meet

Kolkata,(KCN): In 13th IFAF 'student Interface Meet' was held on 23rd February, 2024. In this occasion, Prof. Manimaran Baskaran, Former VC, TNJFU, Prof. Iddya Karunasagar, Research Advisor, NITTE University, Mangalore and Prof. S.D. Singh, Former ADG, ICAR chaired the session, while Prof. S.K. Udgata, Dean, CoF, Odisha Prof. R.K. Trivedi, WBUAFS, Kolkata and Dr. S.K. Majhi, Head, ICAR-CIFRI, Regional Centre, Guwahati acted as panelists. The session began with opening remarks by Prof. Manimaran Baskaran, Former VC, TNJFU and he urged the students to focus on start-ups and innovations. He stated, this is the era of start-ups, precision farming and students should think about innovations in the field of clean tech, climate tech, precision farming. Prof. Iddya Karunasagar, Research Advisor, NITTE University, talked about the opportunities in fisheries sector. He urged the students to be job providers than the job seekers. He highlighted about the potential funding sources from where students can receive fund their innovations. Prof. S.D. Singh, Former ADG, ICAR, encouraged about the need of will-power and self-confidence among the fisheries students. He talked about job opportunities in fisheries sector in India and abroad. Prof. S.K. Udgata, Dean, CoF, Odisha gave a detailed presentation on features of ICAR 6th Dean's committee recommendations with regard to National Education Policy (NEP), 2020 and its adoption in Fisheries Science. Prof. R. K. Trivedi, WBUAFS, Kolkata advocated the need of detailed discussion in NEP and its adoption in Fisheries sector. Dr. S.K. Majhi, Head, ICAR-CIFRI, Regional Centre, Guwahati stated that students should be welltrained and well-equipped with advance technologies. Fortunately, Dr. J.K. Jena, DDG, Fisheries Science was also present in the Meet and he responded to all the queries of the students on matters related to job opportunities in fisheries and aquaculture sector, Agricultural research service (ARS) and national education policy etc. From this Student Interface Meet- 13th IFAF, students got the motivation and clear roadmap about the future job and career opportunities in fisheries and aquaculture sector.

বর্তমান
কলকাতা ও শহরতলি
কলকাতা, শনিবার ২৪ ফেব্রুয়ারি ২০২৪, ১১ ফাল্গুন ১৪৩০

১৩ তম ইন্ডিয়ান ফিশারিজ অ্যান্ড অ্যাকুয়াকালচার ফোরামের সূচনা

নিজস্ব প্রতিনিধি, বিধাননগর: সিফরি (আইসিএআর-সেন্ট্রাল ইনল্যান্ড ফিশারি রিসার্চ ইনস্টিটিউট)-এর উদ্যোগে নিউটাউনে শুরু হল '১৩ তম ইন্ডিয়ান ফিশারিজ অ্যান্ড অ্যাকুয়াকালচার ফোরাম' (আইএফএএফ)। শুক্রবার নিউটাউনের বিশ্ববাংলা কনভেনশন সেন্টারে এই সম্মেলনের সূচনা করেন কেন্দ্রীয় মৎস্যমন্ত্রী পুরুষোত্তম রুপালা। অনুষ্ঠান চলবে তিনদিন ধরে। উদ্বোধনে সিফরির ডিরেক্টর ডঃ বসন্তকুমার দাস সহ একাধিক আধিকারিক উপস্থিত ছিলেন। কেন্দ্রীয় মৎস্যমন্ত্রী জানিয়েছেন, বিকশিত ভারতের জন্য আরও বেশি মাছ উৎপাদন প্রয়োজন। সিফরি কর্তৃপক্ষের দাবি, একাধিক নামী বিজ্ঞানী, উদ্যোক্তা, মহিলা উদ্যোক্তা, মৎস্য চাষি, সরকারি কর্মকর্তা, প্রতিষ্ঠিত শিল্পপতি, ছাত্রছাত্রী এবং সহ ভারত ও বিদেশ থেকে প্রায় ১৫০০ প্রতিনিধি সম্মেলনে অংশ নেবেন। *-নিজস্ব চিত্র*

উদ্যোগ সিফরির

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बुधवार, 28 फरवरी 2024
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इंडियन पंच
सत्य दिखे, निष्पक्ष लिखे

छात्रों को मत्स्य पालन और जलीय कृषि क्षेत्र में नौकरी और कैरियर के अवसरों पर मिला मार्गदर्शन

कोलकाता/संवाददाता । 13वीं आईएफएएफ के 'स्टूडेंट इंटरफ़ेस मीट' के अवसर पर, प्रो. मणिमारन भास्करन, पूर्व वीसी, टीएनजेएफयू, प्रो. इद्द्या करुणासागर, अनुसंधान सलाहकार, एनआईटीटीई विश्व विद्यालय, मैंगलोर और प्रो. एस.डी. सिंह, पूर्व एडीजी, आईसीएआर, प्रो. एस.के. उद्गाता, डीन, सीओएफ, ओडिशा प्रोफेसर आर.के. त्रिवेदी, डब्ल्यूबीयूएएफएस, कोलकाता और डॉ. एस.के. माझी, प्रमुख, आईसीएआर-सीआईएफआरआई, क्षेत्रीय केंद्र, गुवाहाटी ने छात्रों को संबोधित किया । टीएनजेएफयू के पूर्व वीसी प्रोफेसर मणिमारन बस्करन ने छात्रों से स्टार्ट-अप पर ध्यान केंद्रित करने का आग्रह किया। एनआईटीटीई विश्वविद्यालय के अनुसंधान सलाहकार प्रोफेसर

इद्द्या करुणासागर ने मत्स्य पालन क्षेत्र में अवसरों के बारे में बात की। उन्होंने छात्रों से नौकरी ढूँढने के बजाय नौकरी प्रदान करने का आग्रह किया। भारत और विदेश में मत्स्य पालन क्षेत्र में रोजगार के अवसरों के बारे में भी बात की गई । प्रो. एस.के. उद्गाता, डीन, सीओएफ, ओडिशा ने राष्ट्रीय शिक्षा नीति (एनईपी), 2020 और मत्स्य विज्ञान में इसे अपनाने के संबंध में एक विस्तृत प्रस्तुति दी। प्रो. आर.के. त्रिवेदी, डब्ल्यूबीयूएएफएस, कोलकाता ने एनईपी में विस्तृत चर्चा और मत्स्य पालन क्षेत्र में इसे अपनाने की आवश्यकता की वकालत की। सौभाग्य से, डॉ. जे.के. जेना, डीडीजी, मात्स्यिकी विज्ञान भी बैठक में उपस्थित थे और उन्होंने छात्रों के मत्स्य पालन और जलीय कृषि क्षेत्र, कृषि अनुसंधान सेवा (एआरएस) और राष्ट्रीय शिक्षा नीति आदि में नौकरी के अवसरों से संबंधित प्रश्नों का खुलासा किया । इस छात्र इंटरफ़ेस मीट से छात्रों को मत्स्य पालन और जलीय कृषि क्षेत्र में, नौकरी और कैरियर के अवसरों के बारे में प्रेरणा और स्पष्ट रोडमैप मिला।

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CITY: PG 3
Delhi per capita income rises by 22% to Rs 4.61L

NATION: PG 8
'No appeal on caste & religious basis, don't ridicule devotee-deity relation'

FILM: PG 13
'Did some films for the wrong reasons'

Women Conclave : 13 IFAF at Kolkata

Kolkata : The women involved in fishery in the country met in a conclave at Kolkata on "Women empowerment in fisheries" in the 13th Indian Fisheries and Aquaculture Forum on 23rd February 2024. All the women present in the conclave including about 350 fisher women and significant number of researchers unanimously felt that there is serious need of raising the voice for gender equality and role of women in fisheries sector starting from the production to processing to marketing. Earlier, in the morning while inaugurating the conference, Hon'ble Parshottam Rupala Ji, Minister of Fisheries, Animal Husbandry and Dairying, Government of India made a special mention of women fishers' contribution and urged upon the gathering to focus on easing out their hardships. The three days conference (23-25 February) has been organized by ICAR - Central Inland Fisheries Research Institute (ICAR-CIFRI) in collaboration with the Asian Fisheries Society Indian Branch (AFSIB), Inland Fisheries

Society of India (IFSI), and the Professional Fisheries Graduates Forum (PFGF), at Biswa Bangla Convention Centre – Kolkata to discuss on a roadmap for a brighter, more resilient future for Indian fisheries and aquaculture, aligning with sustainable development goals (SDGs) and the vision "Viksit Bharat@2047" of Hon'ble Prime Minister of India.

Realising its importance, the organizers held a special session on this subject on the first day of the three days conference. The session was chaired by Dr. Meena Kumari, Former DDG (Fisheries sciences) and cochaired by Dr. Kiran Dubey, Emeritus scientist, ICAR-CIFE, Mumbai strong advocates of the subject. Dr. Nikita Gopal, Head, Extension Information and Statistics Division, ICAR-CIFT delivered the lead talk on "Gender equity for sustainable future of aquaculture and fisheries" and explained how role of women in fisheries sector is visibly invisible. Dr. Kiran Dubey briefed about diverse role of women in society and fisheries sector and highlighted need for acknowledging the opportunity cost associated with their activities. The panellists also shared their views and research experience on gender roles in the sector. The panel discussed how women access to the money/ economic gains earned by them in the sector is questionable and emphasized on need for ensuring women's financial independence to strengthen their mainstreaming in the sector. The house also discussed on the opportunities for entrepreneurship development for women in fisheries and need for women friendly technologies. The women fishers attending the session opened their minds freely in expressing their hardships and also shared their views for betterment of the sector.

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Fish is the Ultimate stakeholderin fisheries sector:Shri Parshottam Rupala

Hon'ble Parshottam Rupala Ji, Minister of Fisheries, Animal Husbandry and Dairying, Government of India, urged all stakeholders including researchers, government officials, farmers, industry representatives, civil society organizations, and students to unite in the country's efforts towards increasing production and maintaining sustainability in fisheries and aquaculture sector. He was delivering his inaugural address of 13th Indian Fisheries and Aquaculture Forum (23-25 February 2024) organized by ICAR - Central Inland Fisheries Research Institute (ICAR-CIFRI) in collaboration with the Asian Fisheries Society Indian Branch (AFSIB), Inland Fisheries Society of India (IFSI), and the Professional Fisheries Graduates Forum (PFGF), here at Kolkata today.

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Fish is the ultimate stakeholder in the fisheries sector: Union Fisheries Minister Parshottam Rupala

According to the minister, concerted efforts are underway to harness the potential of this sector through effective management, technological interventions, and infrastructure development.

KJ Staff Updated 24 February, 2024 8:33 PM IST

Parshottam Rupala, Minister of Fisheries, Animal Husbandry and Dairying, Government of India, has urged all stakeholders including researchers, government officials, farmers, industry representatives, civil society organizations, and students to unite in the country's efforts towards increasing production and maintaining sustainability in fisheries and aquaculture sector.

He was speaking at the inaugural address at the 13th Indian Fisheries and Aquaculture Forum (23-25 February 2024) organized by ICAR - Central Inland Fisheries Research Institute (ICAR-CIFRI) in collaboration with the Asian Fisheries Society Indian Branch (AFSIB), Inland Fisheries Society of India (IFSI), and the Professional Fisheries Graduates Forum (PFGF) at Kolkata today.

He expected this conference would provide a platform for all the stakeholders to exchange their ideas for fostering Indian fisheries and aquaculture towards sustainable development goals for enhancing fish production and farmers' income. Dr. Himanshu Pathak, Secretary Dept. of Agriculture Research and Education (DARE) and Director General (DG), ICAR, earlier in his address emphasized that towards "Viksit Bharat" from "Vikassheel Bharat", fisheries and aquaculture sector from its fast and sustainable growth rate of 10% will play a major role.

He also stressed on nature-friendly, climate-resilient, and profit-making fisheries sector with the introduction of genetically improved species, smart and precise practices, proper regulatory mechanisms, and skill development.

Dr. Joykrushna Jena, Deputy Director General (Fishery Science), ICAR, elaborates on pollution-free, sustainable, and profitable fisheries, their unrealized potential, and future opportunities for contribution national economy. He urged upon judicious and amicable sharing of resources among the sectors in agriculture for higher production with a pragmatic roadmap for the Amritkaal.

Dr. Basanta Kumar Das, Director, ICAR-CIFRI and the convener of the conference earlier in his remark outlined the total of the three days' vast programs and informed the house that besides the scientific discussions on progress made and plans, the conference will also include special lectures, industry, and fisheries officials and farmers' conclaves, satellite symposia, student corner and technology exhibition to discuss on issues like climate change, natural farming, gender equality, women empowerment, social upliftment, employment opportunities for the youth in the fisheries sector.

THE KALINGA CHRONICLE

12 ANNIVERSARY

THE KALINGA CHRONICLE

Daily Edition: R.N.I. No: ODIENG/2013/52530

Popular People's Daily of Odisha

VOL-12 ISSUE NO-103 BHUBANESWAR TUESDAY, 27 FEBRUARY, 2024 ₹ 2.50

ICAR-CIFRI Organized Industry Conclave at 13th IFAF

Kolkata,(KCN):ICAR-Central Inland Fisheries Research Institute organized Industry Conclave as part of Indian Fisheries and Aquaculture Forum at Biswa Bangla Convention center, Kolkata on 24 February 2024. Shri Sagar Mehra, Joint Secretary, Department of Fisheries, Government of India was graced as chief guest. The session was chaired by Dr. L. N. Murthy, Chief Executive (I/C), National Fisheries Development Board, Dr. George Ninan, Director, ICAR-CIFT and Shri Amit Saraogi, Managing Director, Anmol Feeds Ltd. & Chairman, Livestock task force of Confederation of Indian Industries.

Dr Ganesh Chandra, PI & In-charge, ITMUwelcomed all the dignitaries and briefed about the significance of industry conclave.

Dr. B. K. Das, Director, ICAR-CIFRI and Convener, 13th IFAF & Director, ICAR-CIFRI briefed about the importance of the industrial promotion and collaborative research and development in fisheries and aquaculture sector. He briefed about the technologies and products developed by the ICAR-CIFRI and potential development in the sector. He emphasized that in last decade, fisheries sector is growing at 10% annual growth rate. He call upon the industries for collaboration with research institution for development of technologies and products Shri Sagar Mehra, Chief Guest in his address emphasized on the role of ministry and Prime Minister MatsyaSampada Yojana in revolutionizing the fisheries sector in India. He emphasized on the various initiatives taken by the government to foster growth of the fisheries sector as a whole. He call upon all the industrial partner to join hands to accelerate second blue revolution in India.

Dr. L. N. Murthy briefed about the initiative taken by National Fisheries Development Board for development of fisheries sector in India.

Dr. George Ninon, Director, ICAR-CIFT spoke about the role of ICAR Fisheries institution in development of fisheries in India.

Dr. Kajal Chakroborty, HoD and PI, ITMU, CMFRI, Dr. B. B. Nayak, HoD, ICAR-CIFE and Dr. N. K. Barik, PI, ABI, ICAR-CIFA briefed about the products developed by their institutes for industrial partners.

Twenty Five representative from different industries related to fisheries and aquaculture deliberated in the conclave. These included Anmol Feeds ltd, Abis Fish feeds (1B Group), Glaucus Agrochempvtltd, MM Fisheries, Das & Kumars, M R Aquatech, Vetbiotics, Biostaldt, Basic TPL and Start ups like Fish Fanatics and Aqua Doctor.

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THE TIMES OF INDIA

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An emotional Neil Wagner announces his retirement from international cricket, after the fast bowler is left out of New Zealand's team for the first Test against Australia this week. P 23

Pacer Mohammed Shami undergoes a surgery on his left Achilles tendon, which will rule him out of next month's IPL and possibly T20 World Cup in June. PM Modi wishes him a quick recovery on 'X'. P 23

Use AI, robotics to boost fish farming: Experts

Sarthak.G@timesgroup.com

Kolkata: The use of modern tools and technology, such as artificial intelligence (AI), robotics, remote sensing, genomics and nanoscience, can make India a leading fish producing country: This was the focus of panelists at the 13th Indian Fisheries and Aquaculture Forum, held by ICAR-Central Inland Fisheries Research Institute (ICAR-CIFRI) held at Biswa Bangla Convention Centre.

The three-day conference, inaugurated by Parshottam Rupala, minister of fisheries, animal husbandry and dairying, on Feb 23, stressed the need of research to ramp up production and maintain sustainability in fisheries and aquaculture sector. Around 1,500 delegates from India and abroad, including scientists, entrepreneurs, industrialists, govt officials and fish farmers, were present.

3-DAY CONFERENCE

Rupala said fisheries and aquaculture was a sunrise sector with 10% annual growth rate, which would play a major role to realize PM Narendra Modi's vision of Viksit Bharat@2047.

Experts pointed out researchers and state departments should emphasise quality fish seed production, diversification of species for culture, maintenance of water quality, higher use of unconventional feed resources to reduce inter-sectoral competition, reduce market volatility and eradicate diseases among fish. Basanta Kumar Das, director of ICAR-CIFRI, said, "Water resources, including Amrit Sarovars, may be explored. To achieve 2nd Blue Revolution, the country needs specialised Matsya Vikash Kendra."

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VOL-12 ISSUE NO-103 BHUBANESWAR TUESDAY, 27 FEBRUARY, 2024 ₹ 2.50

ICAR-CIFRI-organized Satellite Symposium on Riverine Fisheries Management : 13th IFAF

Kolkata,(KCN): A satellite symposium on "Riverine Fisheries, Habitat Mapping, and Environmental Health" was conducted at the 13th Inland Fisheries and Aquaculture Forum (IFAF) in Kolkata, West Bengal, on February 25, 2024. The symposium was organized under the sponsorship of the elite Namami Ganga Itemer of the National Mission for Clean Ganga (NMCG), Ministry of Jal Sakti, Government of India. Dr. U. P. Singh, former Secretary Ministry of Jal Shakti, New Delhi, graced the occasion and delivered a talk as a keynote speaker on the topic "Biodiversity Conservation: An Integral Component of Namami Gange." Dr. Singh stressed the importance and overall thrust laid by Namami Gange on biodiversity conservation and was enchanted by the Hon'ble Prime Minister of India, Shri Narendra Modi. Further, a total of six lead lectures were delivered by eminent scientists and academicians, such as Dr. Basanta Kumar Das, Director, ICAR-CIFRI; Dr. Utpal Bhaumik, former HoD of ICAR-CIFRI; Dr. Sandeep Kumar Behera, senior consultant at NMCG; Dr. R. K. Manna, HoD of ICAR-CIFRI; and Dr P. Nautiyal, former professor at Garhwal University.

Dr. Basanta Kumar Das, Director , ICAR-CIFRI and Principal Investigator of the ongoing ICAR-CIFRI NMCG project, outlined the brief activities undertaken by the institute to revive the biodiversity of the Ganga. He emphasised the eight-year-long activities undertaken in the line of river ranching, biodiversity, and ecological assessment. Dr. Das highlighted the tremendous efforts taken up by the CIFRI NMCG project to restore the Hilsa fisheries upstream of the Farakka barrage of the Ganga.

Dr. Bhaumik placed a strong emphasis on managing the Ganga's overall well-being, paying particular attention to the preservation of the valuable hilsa fisheries. Dr. Behera outlined the NMCG's efforts to conserve biodiversity and revitalise the Ganga. He stretched out one of the NMCG's long-term goals for Ganga rejuvenation is to bring back a sufficient number at the river's endangered and endemic species so they can once again occupy their whole historical range and continue to play a vital part in preserving the ecosystem of the Ganga River. Dr. Manna discussed the effects of impoundment on fisheries and riverine ecosystems, drawing on lessons from India's peninsular rivers. Dr. Nautiyal gave a talk about the ecological condition of the Alaknanda River in Srinagar and the decadal shift in the structure of the diatom community. The session was also followed by nine oral presentations on the various ecological and fish diversity of the Ganga River and ended with a brief remark by the chairs of the session, Dr. U. P. Singh and Dr. Utpal Bhaumik.

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VOL-12 ISSUE NO-106 BHUBANESWAR FRIDAY, 01 MARCH, 2024 ₹ 2.50

CIFRI organized 'Farmers and DoF conclave' at Biswa BanglaConvention Centre

Kolkata,(KCN): The 'Farmers and Department of Fisheries (DoF) conclave was held on 23rd February 2024 as part of the 13th Fisheries and Aquaculture Forum (13th IFAF) at the Biswa Bangla Convention Centre in Kolkata, West Bengal. The conclave brought together a diverse array of stakeholders, experts, and policymakers to deliberate on strategies for the upliftment and enhancement of fish production and productivity. The event, organized against the backdrop of increasing demand for fish and challenges faced by the sector/ fish farmers/ fishers, focused on innovative approaches, government schemes, and collaborative efforts. Dr. A. K. Das, Principal Scientist, ICAR-Central Inland Fisheries Research Institute, Barrackpore welcomed the panel experts, farmers and extension/ development officers participated in the programme.

The conclave commenced with a comprehensive overview of the various schemes launched by the central and state governments to boost fish production and support farmers. Pradhan Mantri Matsya Sampada Yojana (PMMSY), a flagship scheme to bring about Blue Revolution through sustainable and responsible development of fisheries sector in India.Dr. L. N. Murthy, Chief Executive of National Fisheries Development Board, Hyderabad addressed the farmers on PMMSY supports to modernize and strengthen the value chain, enhance traceability, and establish a robust fisheries management framework while simultaneously ensuring the socio-economic welfare of fishers and fish farmers. The officials from State Fisheries Department of Arunachal Pradesh, Jharkhand, Odisha and West Bengal took part and exchanged views with the experts. Dr. H. N. Dwivedi, Director of Fisheries, Govt. of Jharkhand discussed research and development efforts for stock improvement in the reservoir ecosystem, including cage aquaculture and low-cost fish feed using locally available ingredients.

While appreciating the ICAR-CIFRI initiatives in the reservoirs of Jharkhand through cage aquaculture, Dr. Dwibedi further urged to link research institutes with state departments through more technological interventions that would help increase fish production and doubling farmers' income. Experts from different field of fisheries discussed various government schemes for the welfare of fish farmers in the conclave. More than 300 farmers were participated in the programme. The conclave was held under the overall leadership of Dr. B. K. Das, Convenor of 13th IFAF and Director of ICAR-CIFRI, Barrackpore. The discussions and views exchanged during the conclave are intended to inspire and guide fish farmers across the country and promote culture of innovation and entrepreneurship in the sector.

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Azadi ka Amrit Mahotsav

Union Minister Shri Parshottam Rupala inaugurates Conference on Indian Fisheries and Aquaculture Forum 2024 Inland Fish Production tripled in last 9 years, says the Minister

Kolkata; February 23, 2024

The Union Minister of Fisheries, Animal Husbandry and Dairying, Shri Parshottam Rupala Inaugurated three-day long conference on the topic of "Indian Fisheries and Aquaculture Forum 2024: Fostering Indian Fisheries and Aquaculture for attaining Sustainable Development Goals" in Kolkata today. The conference will conclude on February 25, 2024 (Sunday). The Minister also inaugurated an Exhibition on Fisheries.

Speaking at the inaugural session, the Union Minister said that India is blessed with rich and diverse fisheries resources and produces a variety of fish. Fish is an important source of food, nutrition, employment, and income in India. This promising sector provides livelihood, employment, and entrepreneurship to around 3 crore fishers and fish farmers at the primary level and several lakhs along the value chain, he said.

Calling fisheries as sunrise sector the Minister said, the Prime Minister Shri Narendra Modi has given priority to it. Since 2015, the Centre has allocated Rs 38,000 crore under different schemes including the Pradhan Mantri Matsya Sampada Yojna, whereas only Rs 3,680 crore was allocated to this sector by the previous governments till 2014.

The Minister mentioned that the fisheries sector of India has gradually evolved over the years to become an important pillar of socio-economic growth of the nation. Commencing purely as a traditional activity at the time of India's Independence, over the past 75 years the sector has transformed into a commercial enterprise with a 22-fold increase in fish production. It has recorded a 10. % growth in fish production, he added.

The growth of inland fish production, predominantly propelled by aquaculture, has been even more spectacular. In fact, the inland fisheries and aquaculture production of the country has almost tripled since 2014. This is due to significant contribution made by our fisheries scientists especially of ICAR institutes in development of various breeding technologies, concerted efforts of the Central Government and hardworking fishers, fish farmers and entrepreneurs, the Minister said.

The Minister asked to look into devising better policies for improving the quality of life and economic well-being of people of the coastal community, especially the marine fishermen in the country. The journey of Sagar Parikrama shall be focusing on developing the sustainable balance between the utilization of marine fisheries resources for the food security of the nation, livelihoods of coastal fisher communities. He also urged the stakeholders to work for protection of marine ecosystems, to bridge the gaps of fisher communities and their expectations, development of fishing villages, upgradation and creation of infrastructure such as fishing harbours and landing centres to ensure sustainable and responsible development through an ecosystem approach in coming phases.

The Minister presented awards to the industry partners and also released Souvenir of 13th IFAF and publications on the occasion.

प्रभात खबर

कोलकाता, शनिवार
24.02.2024

राजपाट प्रभात

आंकड़ों में राज्य पश्चिम बंगाल में बीड़ी श्रमिकों की संख्या लगभग 22 लाख है.

13वें इंडियन फिशरीज एंड एक्वाकल्चर के उद्घाटन सत्र में बोले मंत्री पुरुषोत्तम रूपाला

मत्स्य पालन में मछली एक अभिन्न स्टेकहोल्डर

मछली उत्पादन पर जोर

संवाददाता, कोलकाता

केंद्रीय मत्स्य पालन, पशुपालन और डेयरी मंत्री पुरुषोत्तम रुपाला ने शुक्रवार को कोलकाता में 13वें इंडियन फिशरीज एंड एक्वाकल्चर के उद्घाटन सत्र में उपस्थित कृषि वैज्ञानिकों, शोधार्थियों, सरकारी अधिकारियों, किसानों, उद्योग प्रतिनिधियों, नागरिक सामाजिक संगठनों और सभी हितधारकों से मछली उत्पादन बढ़ाने की दिशा में एकजुट होने का आग्रह किया. उन्होंने आशा व्यक्ति की कि यह मंत सतत विकास लक्ष्यों और प्रधानमंत्री के दृष्टिकोण, विकसित भारत 2024 के अनुरूप भारतीय मत्स्य पालन और जलीय कृषि के लिए एक उज्जवल भविष्य का मार्ग प्रशस्त करेगा.

उन्होंने का कि मत्स्य पालन का क्षेत्र एक उदीयमान सूर्य के समान है, जिसके अंतर्गत इसकी महत्वपूर्ण भूमिका की पहचान के साथ-साथ प्रधानमंत्री मत्स्य संपदा योजना में प्राथमिकता के अनुसार प्रभावी प्रबंधन, उत्पादकता वृद्धि, तकनीकी सहयोग, बुनियादी ढांचे के विकास, वैल्यू चेने को मजबूत करने और मजबूत संचालन द्वारा इसकी क्षमता दोगुनी करने के लिए

13वें इंडियन फिशरीज एंड एक्वाकल्चर कार्यक्रम में बातचीत करते केंद्रीय मंत्री.

ठोस प्रयास किया जा रहा है. मंत्री ने वैश्विक मछली उत्पादन और देश की कृषि जीडीपी में भारत के योगदान और पर्याप्त विदेशी मुद्रा सृजन पर संतोष व्यक्ति किया. उन्होंने बताया हर साल मछली और संबंधित उत्पादों के निर्यात से 63,969 करोड़ की विदेशी मुद्रा प्राप्त होती है.

10 वर्षों में मत्स्य पालन के लिए 38,000 करोड़ रुपये आवंटित

कोलकाता. केंद्रीय मत्स्य, पशुधन और डेयरी मंत्री पुरुषोत्तम रूपाला ने शुक्रवार को कहा कि सरकार मत्स्य पालन को एक 'उभरता क्षेत्र' मानती है और पिछले दशक में इस क्षेत्र को 38,000 करोड़ रुपये आवंटित किये गये. उन्होंने कहा कि वित्तीय समर्थन में मत्स्य पालन बुनियादी ढांचे के विकास के लिए ""प्रधानमंत्री मत्स्य सम्पदा योजना"" के तहत 20,000 करोड़ रुपये का आवंटन और मछली उत्पादन और उत्पादकता बढ़ाने के लिए ""नीली क्रांति"" योजना के लिए 3,000 करोड़ रुपये का आवंटन शामिल हैं. इसके अलावा बुनियादी ढांचे के आधुनिकीकरण और उन्नयन के लिए 8,000 करोड़ रुपये और आगामी वित्त वर्ष के लिए 2024 के केंद्रीय बजट में 6,000 करोड़ रुपये का प्रावधान किया गया. यहां 13वें भारतीय मत्स्य पालन व जलकृषि फोरम में मंत्री ने दावा किया कि देश की आजादी के बाद से वर्ष 2014 तक इस क्षेत्र के लिए आवंटन केवल 3,680 करोड़ रुपये था.

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हिन्दी दैनिक
झारखंड दर्शन

Email : jharkhanddarshan405@gmail.com
Website: jharkhanddarshan.net

छात्रों को मत्स्य पालन और जलीय कृषि क्षेत्र में नौकरी के अवसरों पर मिला मार्गदर्शन

कोलकाता । संबाददाता

13वीं आईएफएएफ के 'स्टूडेंट इंटरफेस मीट' के अवसर पर, प्रो. मणिमारन भास्करन, पूर्व वीसी, टीएनजेएफयू, प्रो. इद्या करुणासागर,अनुसंधान सलाहकार, एनआईटीटीई विश्वविद्यालय, मैंगलोर और प्रो. एस.डी. सिंह, पूर्व एडीजी, आईसीएआर, प्रो. एस.के. उद्गाता, डीन, सीओएफ, प्रोफेसर आर.के. त्रिवेदी, डब्ल्यूबीयूएएफएस, कोलकाता और डॉ. एस.के. माझी, प्रमुख, आईसीएआर-सीआईएफआरआई, क्षेत्रीय केंद्र, गुवाहाटी ने छात्रों को संबोधित किया । टीएनजेएफयू के पूर्व वीसी प्रोफेसर मणिमारन बस्करन ने छात्रों से स्टार्ट-अप पर

ध्यान केंद्रित करने का आग्रह किया ।एनआईटीटीई विश्वविद्यालय के अनुसंधान सलाहकार प्रोफेसर इद्या करुणासागर ने मत्स्य पालन क्षेत्र में अवसरों के बारे में बात की। उन्होंने छात्रों से नौकरी ढूँढने के बजाय नौकरी प्रदान करने का आग्रह किया। भारत और विदेश में मत्स्य पालन क्षेत्र में रोजगार के अवसरों के बारे में भी बात की गई। प्रो. एस.के. उद्गाता, डीन, सीओएफ, ओडिशा ने राष्ट्रीय शिक्षा नीति (एनईपी), 2020 और मत्स्य विज्ञान में इसे अपनाने के संबंध में एक विस्तृत प्रस्तुति दी। प्रो. त्रिवेदी, डब्ल्यूबीयूएएफएस, कोलकाता ने एनईपी में विस्तृत चर्चा और मत्स्य पालन क्षेत्र में इसे अपनाने की आवश्यकता की वकालत की।

ପ୍ରମେୟ

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ଭାରତୀୟ ମତ୍ସ୍ୟ ଏବଂ ଜଳଚର ଫୋରମ୍‌ର ଉଦ୍‌ଘାଟନୀ ଉତ୍ସବ

ମତ୍ସ୍ୟଜୀବୀଙ୍କୁ ପ୍ରୋତ୍ସାହିତ କରିବ ସମ୍ମିଳନୀ

ଜୋଇକାତା,୨୩।୨(ଆପୁ): ଭାରତ ସରକାର ମତ୍ସ୍ୟ, ପଶୁପାଳନ ଏବଂ ଦୁଗ୍ଧ ମନ୍ତ୍ରୀ ମାନ୍ୟବର ପରଷୋତ୍ତମ ରୁପାଲା ଉତ୍ପାଦନ ବୃଦ୍ଧି ଦିଗରେ ଦେଶର ଉଦ୍ୟମରେ ଅନୁସନ୍ଧାନକାରୀ, ସରକାରୀ କର୍ମଚାରୀ, କୃଷକ, ଶିଳ୍ପ ପ୍ରତିନିଧୀ, ନାଗରିକ ସମାଜ ସଂଗଠନ ଏବଂ ଛାତ୍ରଛାତ୍ରୀମାନଙ୍କୁ ଏକଜୁଟ୍ ହେବାକୁ ଅନୁରୋଧ କରିଛନ୍ତି। ମତ୍ସ୍ୟ ଏବଂ ଜଳଚର କ୍ଷେତ୍ରରେ ସ୍ଥିରତା ବଜାୟ ରଖିବା ନେଇ ସେ ଏସୀୟ ମତ୍ସ୍ୟ ସମାଜ ସୋସାଇଟି ଇଣ୍ଡିଆନ୍ ଶାଖା (ଏଏଫ୍‌ଏସ୍‌ଆଇବି) ସହଯୋଗରେ ଆଇସିଏଆର-ସେଣ୍ଟ୍ରାଲ ଆଭ୍ୟନ୍ତରୀଣ ମତ୍ସ୍ୟ ଅନୁସନ୍ଧାନ ପ୍ରତିଷ୍ଠାନ (ଆଇସିଏଆର-ସିଫ୍ରି) ଦ୍ୱାରା ଆୟୋଜିତ ୧୩ ତମ ଭାରତୀୟ ମତ୍ସ୍ୟ ଏବଂ ଜଳଚର ଫୋରମ୍ (୨୩-୨୫ ଫେବ୍ରୁଆରୀ ୨୦୨୪) ର ଉଦ୍‌ଘାଟନୀ ଉତ୍ସବରେ ଭାଷଣ ପ୍ରଦାନ କରିଥିଲେ। ମତ୍ସ୍ୟ ସମାଜ ଆଜି କୋଲକାତାରେ (ଆଇଏଫ୍‌ଏସ୍‌ଆଇ) ଏବଂ ପ୍ରଫେସନାଲ ଫିସିରି ଗ୍ରାଜୁଏଟ ଫୋରମ୍ (ପିଏଫ୍‌ଜିଏଫ୍) ସ୍ଥାୟୀ ଭାରତୀୟ ମତ୍ସ୍ୟଜୀବୀ ତଥା ଜଳଚର ଚାଷୀଙ୍କର ହିମାଶୁ ପାଠକ ଜହିଲ୍ଲି, ମତ୍ସ୍ୟ ସୁଯୋଗ, ଏହାର ଅବାସ୍ତବ ସମ୍ଭାବନା ଏବଂ ଜାତୀୟ ଅର୍ଥନୀତିରେ ଅବଦାନ ବିଷୟରେ ବିସ୍ତୃତ ଭାବରେ ଆଲୋଚନା କରିଥିଲେ। ଆଇସିଏଆର-ସିଫ୍ରି ଏବଂ ସମ୍ମିଳନୀର କନଭେନର ଡକ୍ଟର ବସନ୍ତ କୁମାର ଦାସ ତାଙ୍କର ପୂର୍ବ ବକ୍ତବ୍ୟରେ ମେଗା ଡିନି ଡିନିଆ କାର୍ଯ୍ୟକ୍ରମର ଗାମ୍ଭୀରେଖା ଉପସ୍ଥାପନ କରିଥିଲେ। ଏହି ଅବସରରେ ପ୍ରଫେସର ଏଚ୍.ପି.ସି ଶେଟ୍ଟି ପୁରସ୍କାର, ପ୍ରଫେସର ଟି ପାଣ୍ଡିଆନ୍ ଏବଂ ଏ ମ୍ୟାଟି ପୁରସ୍କାର, ଡକ୍ଟର ଟିଭିଆର ପିଲ୍ଲାଇ, ଡଃ ନନ୍ଦିଶା ପୁରସ୍କାର, ଶ୍ରୀ ଜେ.ଜି. ମାନ୍ୟବର ମନ୍ତ୍ରୀଙ୍କ ଦ୍ୱାରା ବିଶ୍ୱଗୁରୁ ଜାତୀୟ ପୁରସ୍କାର, ଆଇଏଫ୍‌ଏସ୍‌ଆର ଏବଂ ଏଏଫ୍‌ଏସ୍‌ଆଇବି ଯୁବ ବୈଜ୍ଞାନିକ

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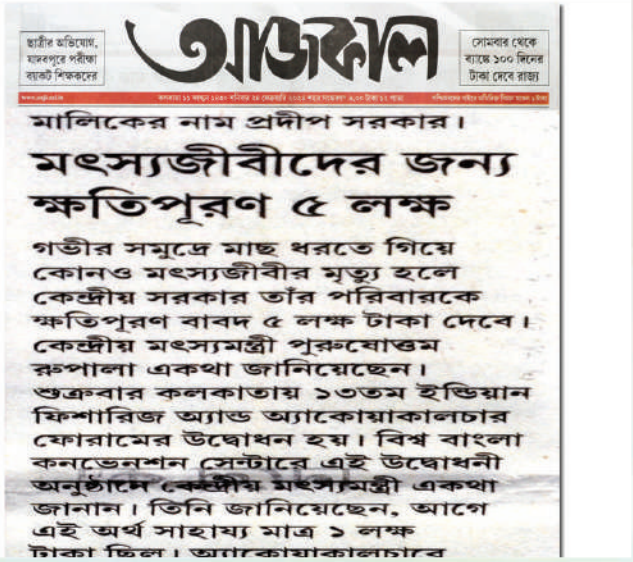
Emphasis on gender equality and role of women in fisheries sector is the need of the hour :Dr. Meena Kumari, Former DDG (Fy. Sc)

Kolkata,(KCN): The Dairying, Government of India made a special women involved in aquaculture, aligning with sustainable development

aculture and ries" andexplained role of women in fisheries sector is visibly invisible. Dr. Kiran Dubey briefed about diverse role of women in society and fisheries sector and highlighted need for acknowledging the opportunity cost associated with their activities. Thepanellists also shared their views and research experience on gender roles in the sector. The panel discussed how women access to the money/economic gains earned by them in the sector is questionable and emphasized on need for ensuring women's financial independence to strengthen their mainstreaming in the sector. The house also discussed on the opportunities for entrepreneurship development for women in fisheries and need for women friendly technologies. The house agreed that the gender mainstreaming requires gender sensitive and socially inclusive policies, programs along with monitoring and evaluation. The chair also urged the scientific personnelpresent to integrate gender studies in their research projects. The women fishersattending the session opened their minds freelyinexpressing their hardships and also shared their views for betterment of the sector.

ICAR-CIFRI organises 13th Indian Fisheries and Aquaculture Forum

All stakeholders including researchers, government officials, farmers, industry representatives, civil society organisations and students need to unite in the country's efforts towards increasing production and maintaining sustainability in fisheries and aquaculture sector, urged Parshottam Rupala, minister, Fisheries, Animal Husbandry and Dairying, GoI during his inaugural address at the 13th Indian Fisheries and Aquaculture Forum organised on February 23 by ICAR-Central Inland Fisheries Research Institute (ICAR-CIFRI) and two other collaborators. He informed that fisheries and aquaculture, being a sunrise sector with a fast and sustainable growth rate of 10%, will play a major role in realising the vision of 'Viksit Bharat@2047'. He said, to harness the potential of the sector, required strategies have been devised in the PM's Matsya Sampada Yojana (PMMSY) with adequate fund allocation. The three-day conference had technical and e-poster sessions covering themes to enhance fish production in sustainable manner with inclusive growth including discussions on Small-scale Fisheries; Biotechnological interventions in Fisheries and Aquaculture, etc.



ছাত্রীর অভিযোগ, যাদবপুরে পরীক্ষা ব্যতট শিক্ষকদের

আজকাল

সোমবার থেকে ব্যাঙ্কে ১০৩ দিনের টাকা দেবে রাজ্য

মালিকের নাম প্রদীপ সরকার।

মৎস্যজীবীদের জন্য ক্ষতিপূরণ ৫ লক্ষ

গভীর সমুদ্রে মাছ ধরতে গিয়ে কোনও মৎস্যজীবীর মৃত্যু হলে কেন্দ্রীয় সরকার তাঁর পরিবারকে ক্ষতিপূরণ বাবদ ৫ লক্ষ টাকা দেবে। কেন্দ্রীয় মৎস্যমন্ত্রী পুরুষোত্তম রুপালা একথা জানিয়েছেন। শুক্রবার কলকাতায় ১৩তম ইন্ডিয়ান ফিশারিজ অ্যান্ড অ্যাকোয়াকালচার ফোরামের উদ্বোধন হয়। বিশ্ব বাংলা কনভেনশন সেন্টারে এই উদ্বোধনী অনুষ্ঠানে কেন্দ্রীয় মৎস্যমন্ত্রী একথা জানান। তিনি জানিয়েছেন, আগে এই অর্থ সাহায্য মাত্র ১ লক্ষ টাকা ছিল। অ্যাকোয়াকালচারে

Smiling Fisher for Viksit Bharat