



**ASSOCIATION OF RETIRED INDIAN COUNCIL OF AGRICULTURAL RESEARCH EMPLOYEES
(ARICARE)**

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ARICARE NEWS

Office Bearers

Governing Body

Dr K.K. Satapathy -President ,Dr . M. Datta – Vice President ,Dr . D.C. Nayak – Secretary ,Dr.G.Bose – Asstt. Secretary ,Mr. S Ranjan Sarkar- Treasurer , Mr. B.K. Saha – Asstt. Treasurer (**Office Bearers**), Dr.B.K. Bandopadhyay Dr. K. Das ,Dr.A. Biswas ,Dr D. Pal , Dr S.S. Pal , Dr (Ms) Shyamali Chakrabarti , Mr.S.K.Pal, Dr. S. Mahapatra , Dr B.K. Mahapatra ,Dr (Ms) M.Das and Mrs J. Nath (**Executive Committee Members**)

Editorial Board

Drs. M. Datta, A. Biswas ,M.S.Basu

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From the President's Desk

Agriculture and The Environment

At the initiative of United Nations Environment program (UNEP), world environment day is celebrated on 5th June every year. To keep global warming below 1.5°C in this century, we must make half of the present greenhouse gas emission by 2030. The projected impact of climate change on Indian Agriculture has become a grave concern for the future food security of the country. Indian present Agriculture being a gamble of monsoon and climate sensitive, even a slight fluctuation of temperature and rainfall pattern adversely affect food and livelihood security of people. Climate change has triggered increase in temperature by 6°C between 1901 to 2018 and caused shifts in monsoon pattern and productivity of most crops. It has caused reduction in global yields of maize, wheat and soybeans between 1981 and 2010. Future warming could further reduce global yields of major crops due to increases in temperature, rainfall variability and decreases in irrigation water.

The major impacts of climate change will be on rainfed or unirrigated crops. Further, rice is one of the most important agricultural products requiring large flooded areas. Under these conditions, many greenhouse gases are generated such as carbon dioxide, methane, nitrogen oxide and its derivatives. Cultivation of rice is responsible by the release of relevant amounts of these gases and contributes decisively to global warming. Live stocks especially ruminant cattle for beef and dairy rank high in greenhouse gas emission such as CO₂, CO, N₂O etc. The agriculture, forestry and land use sector contribute between 13-23% of global greenhouse emission. The amount of greenhouse gas produced during the manufacture and use of nitrogen fertilizer is estimated as around 5% of anthropogenic greenhouse gas emissions. In deforestation, the main land use change releases CO₂ contained in trees when they are destroyed and in addition preventing these trees from absorbing more CO₂. A set of action can reduce Agriculture and forestry-based emissions substantially. These include reducing the growth in demand for food and other Agricultural products, increasing land productivity, protecting and restoring forests and reducing greenhouse gas emissions for agricultural production. Indian Council of Research has launched projects on Climate Smart Agriculture (CSA), which is an integrated approach to manage landscapes to help adapt agricultural, livestock and crop to the effects of climate change and where possible counteract by reducing greenhouse gas emissions from Agriculture and at the same time taking into account the growing population to ensure food security.

From Secretary's Desk

The Editorial Board of our Newsletter "ARICARE NEWS" has tried their best for the publication of Volume 7(2), 2023 in time. Like other issues, the different events and activities of ARICARE performed during the period and the information of various issues of Agriculture and allied subjects and the news/views of National and International importance will be reflected in this issue of ARICARE NEWS.

During the period, the different Sub-Committee of ARICARE have performed significant activities with great initiatives of the President and the cooperation of all members. Two Governing Body meetings were held on 16.03.2023 and 10.05.2023, several meetings of all Sub-Committee were held physically at different ICAR Institutes in Kolkata. Various important issues like medical treatment facilities, tour programmes at National and Inter-national level, social welfare activities, amendment of bye-laws, celebration of Bengali Barsha Baran, publication of Nababasha issue of ANWESHA, membership drive etc., were discussed. Important events/activities performed during the period are: (1) Social welfare like donation of Rs. 25000/- (Rupees Twenty-five thousand only) to Calcutta Orphanage (Kolkata Anath Asram) 12/1, Balaram Ghosh Street, Bagbazar, Kolkata on 20.3.2023, (2) International tour in Nepal during 18.4.2023 to 25.4.2023, (3) the e-publication of the Nababasha Issue of ANWESHA in April, 2023, (4) the celebration of Bengali Barsha Baran (1430) at ICAR- NBSS & LUP, Regional Centre, Kolkata on 02.5.2023.

Sincere thanks to the President, Vice-President, Treasurer, Assistant Treasurer, the members of the Governing Body, the Chairman, Convener and members of all Sub-committee for organizing the above events successfully and also thankful to the all participants for their active participation to make the events very enjoyable and memorable.

During the period, a good number of retired ICAR employees have enrolled in the ARICARE association and we hope, the society will be enriched with their new ideas and active role in various activities of ARICARE. I wish all the best to all members of ARICARE and their family members.

Editorial

It is a matter of great pleasure to inform all the valued members of ARICARE that Editorial Board is successful to bring out July, 2023 issue of **ARICARE NEWS**, available as Vol 7 No 2 in digital format through collection of all information as contained in this publication. We do express our heartfelt gratitude to office bearers including President, Secretary, Asstt. Secretary, Treasurer and Asstt. Treasurer and all members/ their families of ARICARE for the help and support to bring out this digital publication. ARICARE News has a compilation of Meeting and Events taking place in the period from February to July, 2023 in the form of ARICARE GB and AGM meeting, Activities of different Sub-Committee, Tour performed with the places visited by the members, Celebration of Bengali New year with performances of Songs / Recitation and IllishUtsabetc. Editorial Board is expressing a heartiest welcome to the new 6 members for becoming Life Member of our beloved Association. Professional Achievements as elaborated in this issue have indicated that we, though retired but not tired, are also involved in various activities, viz., our engagements in Research Institutes, Universities and Colleges. Many of tasks performed by us, are of high adoration in a manner that our advices / suggestions are needed for value addition in Research and Educational Institutions.

Some of the members have publication of Research Papers and Book thus indicating our commitment in enhancing the horizon of knowledge in Agri and Allied activities in which we spent our career before superannuation. The Research and Entrepreneurship Thoughts provided by some of our members are appreciable in order to harness significant emerging idea of the profession left behind during our service career and further to translate in the farming context. Agri. Science/Technology News are voluminous and attempts are made by the Editorial Board to screen some of them and report herein for information to our readers. It may be

pertinent to quote from a film by Legendary Film Maker Satyajit Ray in HiraK RajarDeshe(A tale of Fantasy Kingdom) – জানার কোনো শেষ নাই,জানার চেষ্টা বৃথা তাই (There is no end of Knowledge, it is futile trying to learn).

We do collect fund from our members in order to perform Welfare Activity for the Society and these activities are also reported in ARICARE News. In addition to Welfare Activity of our Association , many of our members may have different kind of well-beingperformances to bring happiness to the needy people around us , but those benevolent activities should also be reported herein so as to encourage others to do the same .” *Service to others is the rent we pay for our room here on earth.*”

The major stages of a human life cycle are Birth , Infancy ,Toddler years ,Childhood ,Adolescence, Adulthood, Middle age , Senior years . We have passed many stages of our life and are all in Senior years of our life with either happiness /satisfaction or sadness varying in dimensions.” ***Happiness does not depend on what you have or who you are . It solely relies on what you think***”- **Said Gautam Buddha.Ikigai**(A Japanese Secret to a long and Happy Life) urges individuals to simplify their lives by pursuing what sparks joy for them. “ Only staying active will make you want to live hundred years”- Japanese Proverb. In fact, there is no word in Japanese that means retire in the sense it does in English. Be busy and Be happy, being the real meaning of Japanese life to remain mentally young. Only Message left here - **Take care** for our wonderful journey together.Regards.

Meetings and Events

Governing Body Meeting

Governing Body Meeting (1st) of ARICARE was held on 16.03.2023 at 3.00 P.M.in the meeting room of ARICARE at ICAR-NINFET, Kolkata. Total ten members were present in the meeting namely Dr. K. K. Satapathy, Dr. Goutam Bose., Dr. A. K. Sahoo, Dr.(Mrs) Syamali Chakraborty, Dr. Debasis Pal, Mr. S. R. Sarkar, Mr. B. K. Saha, Dr. Asok Biswas, Mr. Subrata Kumar Pal and Mr. Ujjal Kumar Ghosh.

Agenda-1: Discussion of the Bye-laws of the Association

The matter was discussed at length in the Governing Body meeting held on 17.01.2023. Once again it was explained by the President that only three items namely (1) Type of members (2) Term of office-bearers and (3) Mode of Bank operation which point is absent in the present Bye Law will be included and placed it before the A.G.M. for approval.

Agenda-2: Fixation the date of Annual General Meeting

It has been decided that 9th Annual General Meeting of ARICARE will be held on 7th June, 2023 (Wednesday) at ICAR-NINFET Auditorium.

Agenda -3: Appointment of Returning Officer for holding of Election

It was unanimously decided that Dr. Nimai Chandra Pan will act as the Returning Officer for holding of Election. Modality of norm will be chalked out by him.

Agenda-4: Any other issues

Membership Drive: The President requested all GB members to take initiatives to include new members from different Institutes of ICAR. Barshabaran Utsab: Barshabaran (Bengali new year) Utsab will be celebrated on 28th April, 2023 (Friday) in ICAR-NBSS & LUP auditorium, Salt Lake. Dr. Debasis Pal and Dr. Krishnendu Das will take necessary action to organise the event.

The meeting ended with a vote of thanks to the chair.



View of GB Meeting on 16th March , 2023

Governing Body Meeting (2nd) of ARICARE was held at 2.30 P.M. on 10.05.2023 in the meeting room of ARICARE at ICAR-NINFET, Kolkata. Total eleven members were present namely Dr. K. K Satapathy, Dr. D. C. Nayak, Mr. Sumitranjan Sarkar, Mr B K Saha, Dr. B.K. Bandyopadhyay, Dr. S. S.Pal, Dr. Syamali Chakrabarti, Dr. Krishnendu Das, Mr. Swapan Kumar Sinha, Mr. Subrata Pal and special invitee-Dr. Nimai Chandra Pan. The President, Dr. K.K. Satapathy, welcomed the members. The meeting was started as per agenda.

Agenda-1: Confirmation of the minutes of the Last GB meeting

The Secretary mentioned that the last GB meeting was held on 16.03.2023. The minutes was circulated to the all members through e-mail. Again, the highlights of the minutes were read out and confirmed by the members.

Agenda-2: Fixation of the date of AGM (2022-2023)

In the last GB meeting, it was tentatively fixed on 7th June, 2023 (Wednesday) at ICAR-NINFET Auditorium. As the election of the office bearers will be held in the coming AGM, the sufficient time is needed for the circular, nomination filling and withdrawal and other election activities, the date of the 9th Annual General Meeting of ARICARE (2022-2023) is fixed on 12th July, 2023 (Wednesday) at ICAR- NINFET Auditorium, 12 Regent Park, Kolkata-700040.

Agenda-3: Discussion on the amendment of Bye-Laws of the Association

Regarding the amendment of Bye-Laws of the Association, the President mentioned that it was placed in the last two AGM, but still it was not realized. He told the secretary that we should be well prepared for online submission of Form-IV with supported documents. The President requested the Secretary that the minimum and necessary points to be amend and it may be circulated to the members of ARICARE well before the Scheduled AGM for the discussion and approval in the coming AGM.

Agenda-4: Discussion on the Audit and Accounts of the Year 2022-2023

Mr. Sumitranjan Sarkar, the Treasurer informed that the accounts of ARICARE for the period from 01.4.2022 to 31.3.2023 was prepared and audited by the appointed Audit firm. He briefed the audited statements of Income and Expenditure as well as the Receipts and Payments.

Agenda-5: Discussion on the activities of ARICARE

The President expressed his satisfaction with the different activities taken in the period of 2022-2023. He informed that a meeting of various sub-committee may be organized at ICAR-ATARI, Salt Lake for in-depth discussion of the activities of the Association.

Agenda-6: Any other issues with the permission of the chair.

The President informed the house that the election of the office bearers for the period 2023-2024 should be held in the coming AGM. In the last two/three years we could not assembled properly due to Covid situation. For the said election, the name of Dr. Nimai Chandra Pan was proposed as the Election Officer. The members of the house agreed with the proposal and Dr. Pan accepted our proposal. He will conduct the election as per standard procedure. The President also informed that a good number of new members registered their membership in our Association in this year and all are requested to look into this matter.

The meeting came to an end with votes of thanks.



GB Meeting held on 10th May,2023

Annual General Meeting (AGM)

The **Annual General Meeting** of ARICARE for the year 2022-23 was held on 21.07.2023(Friday) in the Kennedy Hall, Department of Jute and Fibre Technology, Calcutta University, 35,Ballygunge Circular Road, Kolkata-700035 under the Chairmanship of Dr.K.K.Satapathy,President of the Association. ARICARE Members (39) attended in the AGM. Dr. Goutam Bose, AssistantSecretary welcomed all the members and explained briefly about the purpose of the meeting.In his presidential address, Dr. Satapathy welcomed all the members and also mentionedabout the sincere efforts of Mr. Sumitranjan Sarkar and others for organizing the meeting at theDept. of Jute and Fibre Technology Division, C.U. He explained briefly the importance of theassociation and expressed his happiness for well performance of various activities undertakenduring the reported period. He thanked all the members of ARICARE for their whole heartedcooperation and participation in most of the event throughout the year. He specially thanked tothe Chairman, Convenor and members of different Sub Committee for well organizing thedifferent events including publication of e-Newsletter and e-Magazine "Anwasha" in time.

Agenda of the AGM

Agenda-1: Obituary

Dr. G. Bose informed the house that Dr. Rajat Kumar Tarat, our member from ICARR Research Complex for NEH Region expired on 1 st May, 2023 and requested the members to payhomage to the departed soul by observing silence for 1 minute.

Agenda-2:Confirmation of Proceedings of the last AGM

Dr. G. Bose briefly explained the salient points of the last AGM held on 14.07.2022and after discussion it was passed by the house.

Agenda -3: Secretary's Report

The Secretary's report for the period 2022-23 was presented by Dr. G. Bose, Asstt.Secretary of the Association. The detail of the report is annexed herewith. After discussion it was passed.

Agenda-4: Auditors Report

Mr. Sumitranjan Sarkar, the Treasurer presented the Auditors Report and thestatement of accounts including Receipt & Payment, Income & Expenditure and Balance Sheetof the Association for the period 2022-23. After discussion among the members, the account was passed unanimously.

Agenda-5: Felicitation to Senior Members

Dr. Debanjan Sur who attained 75 years of age was felicitated by President of theAssociation by presenting an "Uttario" and a Wall Clock. In his speech Dr. Sur thanked to the Association for honouring him.

Agenda-6: Amendment of Bye-laws

Mr. Sumitranjan Sarkar presented the Bye-laws of the Association. After thorough discussion, the suggestions /inclusions and rectifications were unanimously accepted by the house for further action.

Agenda-7: Brief report by the Chairman of various Sub-committee

a) Tour Sub-committee

Dr. (Mrs.) Syamali Chakrabarti informed the house that during the period, International Tour to Bangladesh was undertaken with 14 persons including family members from 5 th Sept. to 15 th Sept., 2022. Another International Tour to Nepal was performed with 12 members including family members and 2 guest members during 18.04.23 to 25.04.23. 5 (five) persons including family members had participated in the domestic tour (29th Nov. to 5th Dec., 2022) to North East covering Manipur and Nagaland. 16 persons including family members participated in tour to Sunderbans from 19th to 21st January, 2023.

b) Pension, Administration and Medical Sub-Committee

In absence of the Chairman Dr. Mrinmoy Datta, Mr. Sumitranjan Sarkar explained the activities undertaken by the committee and sorted out the problems faced by the pensioners who were drawing through the bank directly. With vigorous effort, their pension papers have been sent to CPPC, Kolkata and now getting their pension in time with other pensioners.

c) Social and Cultural Sub-Committee

Dr. Krishnendu Das, the Chairman of the Committee informed the house about the activities undertaken by them namely Annual Picnic, Vijaya Sanmilani and Bengali Barsha Baran.

b) Digital Media Sub-committee

Dr. G. Bose, the Chairman of the Committee explained the details of the performance of the committee.

c) Community Service Sub-committee

Dr. K. Das informed the house that a cheque amounting to Rs.25,000/ (*Welfare Fund*) was donated to the Secretary, Calcutta Orphanage (Kolkata Anath Asram), Bagbazar, Kolkata on 20.03.2023.

d) E-Magazine "Anwasha"

Dr. S.S. Pal told that the members and their family were participated in submitting the write-up in different topics and also the publication of Digital Literary Magazine "Anwasha" in time.

Agenda-8: Election of the new Governing Body

The result of election of the new Governing Body was presented by Dr. Nimai Chandra Pan, the Returning Officer. The following nominations were received within last date of submission of nomination on or before 10.06.2023. Since no other nominations were received. The following members were declared elected for the year 2023-24.

- 1) *Dr. Krishna Kishore Satapathy* President (Ex-NINFET)
- 2) *Dr. Mrinmoy Datta* Vice-President (Ex-ICAR Res. Complex)
- 3) *Dr. Dulal Chandra Nayak* Secretary (Ex-NBSS&LUP)
- 4) *Dr. Gautam Bose* Assistant Secretary (Ex-NINFET)
- 5) *Mr. Sumitranjan Sarkar* Treasurer (Ex-NINFET)
- 6) *Mr. Binay Kumar Saha* Assistant Secretary (Ex-NBSS&LUP)

Executive Committee Members

- 1) *Dr. Krishnendu Das* (Ex-NBSS&LUP)
- 2) *Dr. Asok Biswas* (Ex-CIFE)
- 3) *Dr. Debasis Pal* (Ex-CSSRI)
- 4) *Dr. Sudhansu Sekhar Pal* (Ex-IIFS)
- 5) *Dr. (Ms) Syamali Chakrabarti* (Ex NRC for Orchids)
- 6) *Mr. Subrata Pal* (Ex-CRIJAF)

The names of the following members were proposed in the house and were unanimously accepted.

- 7) *Dr. Sankar Mahapatra* (Ex-NBSS&LUP)
- 8) *Dr. B.K. Mahapatra* (Ex-CIFE)
- 9) *Dr. Bimal Kumar Bandyopadhyay* (Ex-CSSRI)
- 10) *Dr. (Ms) Madhumita Das* (EX-IIWM)
- 11) *Mrs Jayasree Nath* (Ex-NINFET)

Agenda-9: Vote of thanks

Dr. Asit Baran Mondal offered vote of thanks at the end of the meeting. In his speech, he mentioned about the contributions made by members of different teams in organizing this meeting and making a grand success. He also thanked all existing as well as new members for their presence and active participation in the AGM.



AGM Meeting held on 21st July , 2023



Delivering Presidential Address by Dr K.K. Satapathy



A view of Members present in AGM



Dr. Debanjan Sur being felicitated by President

Tour Sub - Committee

Tour Sub-Committee meeting was held on 04-02-2023 at COFFEE XO, Patuli on 04.02-2023 and Drs K.K. Satapathy , M. Datta , Shyamali Chakraborty and ShriB.K.Saha had attended the meeting to discuss about the International Tour to Nepal. On 14.06-2023 , the Tour-Sub-Committee meeting of ARICARE was held at Roof Top Café 6 No. Patuli , Dr K. K. Satapathy , Dr (Ms) Shamali Chakraborty,Dr. Krishnendu Das and Mr.B.K.Saha were present in the meeting.

Meeting held on 4th February ,2023Meeting held on 14th June , 2023

International Tour to Nepal

A total of 12 participants from ARICARE had visited places (Lumbini ,Chitwan ,Pokhrah , Kathmandu and Nagerkot) in Nepal for a period of 8 days from 18th April to 25th April ,2023.Nepal is the country of the Mount Everest , the highest Mountain peakin the World and the Birthplace of Gautam Buddha at Lumbini. Pashupatinath is the most sacred Hindu Temple, dedicated to Lord , Shiva at Kathmandu.



Pashupatinath Temple at Kathmandu

Pashupatinath – Guardian Deity of Nepal , UNESCO World Heritage Site



We are in Kathmandu at Hotel Arts



At Hotel Himalayan Villa , Nagerkote



Nyatapola Temple, Bhaktapur



Evening Arati ,Fewa Lake , Pokhara

Barshobaran(নববর্ষ)

Bengali New year is a significant cultural and traditional festival celebrated by Bengalis across the World and Pohela Boishakh falls on April 15 , 2023 and it marks the beginning of the Bengali Calendar Year , 1430 . Barshobaran festival was organized by ARICARE at ICAR- NBSS &LUP , Kolkata on 2nd May , 2023 and 64 persons of ARICARE Members and their families were present in the celebration. Being inaugurated by Dr K.K. Satapathy , President , ARICARE ,all were entertained by songs performed by Dr G. Roy ,Mr. S.K. Sinha ,Mrs Sikha Satapathy , Mrs Krishna Pal and recitations by Dr S.S. Pal ,Dr Debanjan Sur , Mr. B.D. Mandal , Dr R.K. Mandal , Dr (Mrs) Rina Naiya ,Dr (Mrs) Utapala Parthasarathy and Dr Asok Majumdar . Nabobarsho issue of AnnewswaPatrika was also released .



Our members along with families



Barshobaran at a glance

Donation of ARICARE

From our Welfare Fund ,**Rs 25,000/-** was donated to Calcutta Orphanage (Kolkata Anath Asram), 12/1, Balaram Ghosh Street, Baghbazar, Kolkata on 20th March ,2023 in order to purchase text books for students of Orphanage Home , studying in different schools in nearby places.On behalf of ARICARE , Dr. (Mrs.) Syamali Chakraborty, Dr. Krishnendu Das and Mr.

B.K. Saha were seen handing over the cheque to Mrs. Anusila Sengupta, Secretary , Calcutta Orphanage.



Donation from ARICARE Welfare Fund

-The best way to find yourself is to lose yourself in the Service of others – Mahatma Gandhi

Social and Cultural Sub-Committee

Our Social and Cultural Sub- Committee is instrumental to organize various ARICARE activities such as Annual Picnic ,Naboborsho celebration , Vijaya Sanmelani and other related festivals. A virtual meeting of this vibrant committee was held on 19th June ,2023 at 8.30 PM through Google Meet. Drs K.K. Satapathy ,K.Das, Debasish Pal ,Mr. S.R. Sarkar and Mrs Jayashree Nath were present in the meeting.

IllishUtsab

IllishUtsab (Eating Cuisines made from Hilsa Fish) was organized by ARICARE members along with their families on 29thJuly , 2023 at ICAR- CIFRI , Barrackpur , Kolkata. Hilsa fish, State Fish of West Bengal ,holds a very special place in the hearts and taste buds of Bengalis. The assembled Members of ARICARE had enjoyed the day of Hilsa fish Utsab along with their family members.



We (24 persons) are in ICAR-CIFRI for enjoying IlishUtsab

Life Member

The following 6(six) persons retired from ICAR , have become Life Member during the period from February, 2023 to July , 2023. Photographs of our retired colleagues, available with ARICARE ,are depicted hereunder.

- Dr.(Mrs) Rina Naiya ,Former Asstt.Chief Technical Officer, ICAR-NINFET, Kolkata
- Dr. Tarit Chattopadhyay , Former Sr. Scientist ,ICAR-NBSS & LUP, Regional Centre ,Kolkata
- Shri Prabin Kr. Chowdhury , Former Technical Officer, ICAR- NINFET, Kolkata.
- Shri. Prosenjit Sanyal, Former Chief Technical Officer , ICAR- NINFET, Kolkata.
- Shri Kishun Lal Ahirwar , Former Asstt. Chief Technical Officer , ICAR- NINFET, Kolkata.
- Shri Radha Raman Debnath , Former Asstt. Finance & Accounts Officer , ICAR Research Complex for NEH Region, Barapani, Meghalaya.



Dr (Mrs) Rina Naiya



Dr. Tarit Chattopadhyay



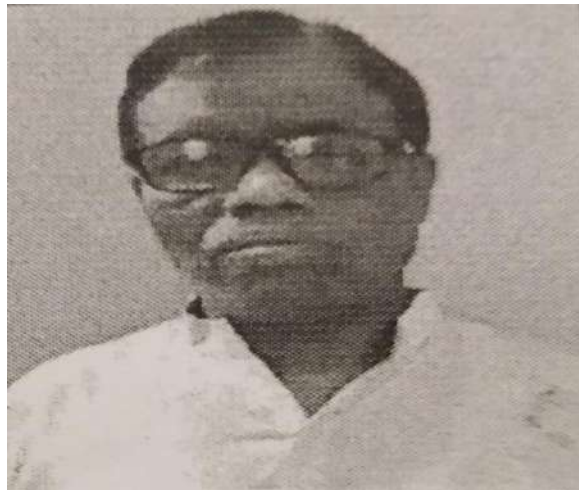
Shri Prabin Kr. Chowdhury



Shri. Prosenjit Sanyal



Shri Kishun Lal Ahirwar



Shri Radha Raman Debnath

Professional Achievements

Dr. P. Das, Former Deputy Director General (Agricultural Extension), ICAR, New Delhi had the following engagements for the period as reported in this issue of ARICARE News.

Date	Brief
Feb. 02-04	<p>'International Conference on Food and Nutritional Security for Achieving Sustainable Development Goals (SDGs) in SAARC Countries: Revisiting Extension Approaches and Strategies'. Society for Bangladesh Agricultural Extension Network (BAEN), Dhaka, Bangladesh, and Participatory Rural Development Initiatives Society (PRDIS) Hyderabad, India, 2 - 4 Feb 2023, Dhaka, Bangladesh.</p> <p>--Co-Chair cum Moderator, Technical Session I: Challenges and Policy reforms in Food and Nutritional Security in SAARC Countries, Feb. 02, 2023.</p> <p>-- Presented 'Integrating Traceability with Food and Nutrition Security - Repurposing Food Safety for Better Food in SAARC Countries', as Invited Speaker on Feb. 03.</p>
Feb. 07	Subject Expert, Selection Committee Meeting, CAU, Imphal
Feb. 08	Subject Expert, Selection Committee Meeting, CAU, Imphal
Feb. 21-22	Two Day State Level Farmers Workshop on 'Sustainable farm Income through Integrated farming System by Adopting Biotic stress Management', ICAR-National Institute of Biotic Stress Management, Baronda, Raipur
	-Plenary Lecture on 'Frontiers of Extension Methodology: reducing Technology Adoption Time' Feb,21, 2023
	-Chief Guest, Valedictory Session, Feb,22, 2023
March 3	Advisor, Selection Committee Meeting, ASRB
March 4-7	Editorial Committee of International Conference on Natural Farming for Vitalizing Environment and Developing Agriculture (N – VEDA – 2023), Imphal
March 17-19	<p>International Conference on Natural Farming for Vitalizing Environment and Developing Agriculture (N – VEDA – 2023), Imphal</p> <p>-Delivered Keynote Address entitled, 'Balancing Ecological Footprint and Biocapacity Through Natural Farming Based Food System in South Asia'.</p> <p>-Chaired the Technical Session on 'Incorporating Ecological Principles as an Operational Framework for transitioning Sustainable Agriculture in Diverse Agro-Ecosystems'.</p> <p>-Presented Recommendations of the Conference in the Valedictory Session, the Chief Guest being Dr. Rajkumar Ranjan Singh, Minister of State for External Affairs and Education, Government of India.</p>
April 7-8	<p>Eleventh Brainstorming Session of Vice Chancellors of Agricultural Universities under the aegis of Indian Agricultural Universities Association (IAUA), held at Rani Lakshmi Bai Central Agricultural University, Jhansi.</p> <p>-Participated in the Technical Session on 'Sustainable Management of Soil and Water Resources.</p> <p>-Chaired the Technical Session on 'Introducing Innovations (AI, IoT, Blockchain, Agri-Drone, Blended Learning)'.</p>
April 18	Zoom Meeting of <i>Krishi Jagron</i> to discuss on Selection Criteria of "Richest Farmer of India",

May 10	Advisor, Selection Committee Meeting, ASRB
May 19-22	Meeting of CAU (Imphal) held at Kolkata, Chaired by VC
June 12	Expert for finalization of research programme in broad thematic areas of Social Sciences in Agriculture ,CAU, Umam, Meghalaya
June 13	-Attended the Board of Management, Pragjyotishpur University, Guwahati -Presented the Concept of Establishment of International University on Hindu Studies
June 22-24	Presented Lead Paper in the National seminar on 'Evolving Extension Science towards Secondary Agriculture for Sustainable Development', at UAS GKVK, Bangaluru

Dr.K.K.Satapathy, Former Director , ICAR- NINFET , Kolkata had the following engagements

- Consultant to Climate Resilient Water Harvesting Programme under Soil and Water Conservation Department, Govt. of Meghalaya in the month of June , 2023.
- External Expertfor finalization of Research Programme on Soil and Water Conservation ,CAU,Ranipool, Gangtok,Sikkim in the month of June ,2023.
- Chairman , Assessment Committee of Technical Staff (Workshop & Engineering) , Indian Institute of Water Management , Bhubaneswar in the month of March and July , 2023.

Dr . D.K. Kundu , Former , Head , Department of Crop Production , ICAR- CRIJAF , Barrackpur had published the Research paper

- Sonali Paul Mazumdar, **Dilip Kumar Kundu**, Debarati Datta, Bijan Majumdar,Amit Ranjan Saha, NurnabiMeherulAlam, Sitangshu Sarkar, Ritesh Saha,Sabyasachi Mitra and Gouranga Kar (2023) Sulfur fertilization enhanced productivity and profitability of popular kenaf varieties.Journal of Plant Nutrition,<https://doi.org/10.1080/01904167.2023.2222009>.

Dr. M.Datta , Former Joint Director , ICAR Research Complex for NEH Region , Tripura had published the book.

- U.C.Sharma, **M.Datta** and Vikas Sharma (2023) Soils in Hindu Kush Himalayas, Management for Agricultural Land Use, <https://doi.org/10.1007/978-3-038-11458-8>, Published by Springer Nature, Switzerland, 468p.

Dr Pratap Mukhopadhyay , Former Principal Scientist , ICAR-CIFA , Bhubaneswar had attended RAC meeting as a Member at ICAR-CIFE, Mumbai during April 23-24, 2023.

Dr. B.K. Mahapatra, Former Principal Scientist and Scientist In-charge, ICAR-CIFE, Kolkata had the following engagements

Date	Brief
04.02.2023	Attended NFDB Sponsored training programme as a resource person and delivered lecture on Aquaculture Technology at Sasya Shamala Krishi Vigyan Kendra
05.02.2023	Attended as a guest in 63 rd Annual Exhibition at Nimpith Ashram, Sundarban.
06.02.2023.	Acted as a Practical Examiner for the 3 rd Semester in Zoology for the Department of Zoology of Vidyasagar University
07-02-2023	Attended as External Examiner for Ph.D Comprehensive in the Department of Aquaculture ,West Bengal University of Animal Sciences and Fisheries , Kolkata
08-02-2023	Imparted Hands on Training on ornamental Fish Farming at ICAR- CIFE, Kolkata
09-02-2023	Attended as a guest speaker for taking a session on "Recirculatory aquaculture systems" and "Aquaponics" at Neotia University.
15-02-2023	Participated as Expert in DD Bangla Krishi Darshan Programme on Growing of Prawn in Pond.
26-02-2023	Attended to take a session on "Biodiversity Conservation for Climate-Resilient Sustainable Development" through pisciculture and Panel discussion for National Convention-SANCALP at IBRAD (Indian Institute of Bioloical Research and Development), Kolkata
27-02-2023	Delivered lectures in the topic entitle " Biofloc Technology" and "Recirculatory Aquaculture Systems" at the Directorate of Fisheries, Govt. of West Bengal
20-03-2023	Attended as Trainer for the Entrepreneurship development Programme (EDP) training at Department of Labour Sub-regional Employment Exchange Barrackpore, North 24 Pgs.
26-03-2023	Attended the programme at Environmental Science and made a deliberation at University of Burdwan.
28-03-2023	Acted as Facilitators in PAN India Training Programme and Deliberation made on 1) Biofloc and RAS Installation and Management and

	18
	2)Ornamental Fish farming and post harvest management at LINAC-NCDC Fisheries Business Incubation Centre (LIFIC), Govt of India.
26-04-2023	Delivered seminar lectures for Zoology students at Vidyasagar University.
27-04-2023	Delivered lectures on Entrepreneurship development on Aquaculture at Binoy Krishna Choudhury Rural Technology Centre under Burdwan University.
28-04-2023	Attended as Introduction Speaker for Professor N.C. Datta Memorial Award Lecture at Rajabazar Science College.
04-05-2023	Delivered lecture for "World Earth Day" at Scottish Church College, Kolkata.
19-05-2023	Attended as Guest Speaker and delivered lecture on "Breeding and culture of Ornamental fish" at NBFGR through Zoom online training.
23-05-2023	Delivered lecture for PG Students of Zoology at Vidyasagar University.
5/6-06-2023	Assigned as facilitator at LINAC-NCDC Fisheries Business Incubation Centre (LIFIC), Gurugram. - Delivered lecture in the Topics on "Biofloc andRAS Installation and Management " and"Ornamental Fish Farming & Post harvestmanagement"- Delivered lecture in the Topics on "Case study ofFisheries sector on World scenario and Case studyon fisheries sector on Indian Scenario"
16-06-2023	Participated as Guest of Honour the Wetland Day Celebration Programme at Uttar GarumaraBheri, North Bengal.
12-07-2023	Attended as Examiner for M.Sc Fishery Science at Midnapore City College.
25-07-2023	Assigned as Guest Speaker and delivered lecture on "Breeding and culture of Ornamental fish" at NBFGR, Lucknow.

Dr. B.K. Mahapatra (2023) had published an article on Aquaculture: Freshwater Ornamental fishes and their management' : EIACP Centre on Biodiversity (Fauna) ,Zoological Survey of India , 29 (1) , 2-19.

Dr S. K. Gangopadhyay , Former Principal Scientist , ICAR-NBSS & LUP , Kolkata had published the following research papers.

- **Gangopadhyay, S.K.** (2023) Temperate Soils of India with Special Reference to Soil Carbon and their Management. Indian Journal of Fertilisers (FAI), 19 (5) : 436-455.
- **Gangopadhyay, S.K.** and Bhattacharyya, T. (2022) Mollisols of Sikkim: The Unique Soils of the Humid Temperate Zone of India. Clay Research, 41 (1), 13-35. DOI: 10.5958/0974-4509.2022.00002.X..
- **Gangopadhyay, S.K.** and Bhattacharyya, T. (2022) Soil Carbon Stock in Non-traditional Black Soils of North Eastern India: Tripura as Example. Agropedology, 32 (02), 226-239. doi.org/10.47114/j.agroped.2022.dec8.

Research/Entrepreneurship Thoughts

Save Indian Agriculture from Peril – Do not leave it to die like Dinosaurs

M.S. Basu , Former Director , ICAR- DGR, Gujarat

There are reasons to believe Agriculture in India is terribly sick and dying, put on ventilator and oxygen in the name of cash dole to 95 million farmers. Access to required resources, critical inputs are limited to handful of rich farmers mostly in the states of Punjab, Haryana and Gujarat. Some 405 million smallholder, marginal farm families in the states of Bihar, UP, North East and WB are getting deeper into debt-trap as their monthly income exceeds expenses, just to survive ! https://www.linkedin.com/posts/mukti-sadhan-basu-ph-d-30769459_cash-support-to-farmers-free-ration-indicators-activity-6799556933255860224-sgHO

Indian policy makers are tuned to walk on silky road using prime land for record/surplus production of cereals, even allowing the produce to rot. Whereas, oilseeds and pulses continue to break heads on drylands, paving way to import oils worth Rs. 73,000 million and pulses worth Rs. 102,000 million annually but remain out of reach to the people at grassroots level with almost no purchasing power. Consequently, India has turned into a home of 193 million malnourished and 238 million underweight where Dal and Oils are luxury items to them. <https://www.linkedin.com/pulse/who-can-rescue-half-indias-malnourished-where-victims-basu-ph-d>

Needless to say, it's a lopsided agricultural policy having no state-wise balanced crop production plan meeting overall requirements of essential commodities, though agriculture is a State Subject. It mimics to a musical chair game, where any state can produce anything they like with no interventions of NITI Aayog but Govt at the Centre stands liable to buy at minimum support price (MSP). Such unplanned tapping of natural resources, groundwater; indiscriminate uses of chemical fertilisers, pesticides to select crops cannot continue for long from sustainability point of view. The health of agriculture in an agrarian county is supreme and here is the basic prescription proposed to PM as back as 2017 to recharge agriculture, remained unattended. <https://www.linkedin.com/pulse/prescription-make-indian-agriculture-productive-open-pm-basu-ph-d>

However, issue based specific treatment as suggested here should bring agri sector out of ventilator and therefore, back to health enabling to stand on its own foot.

1. Good seed is the key to good agriculture. Govt Seed Agencies must stop buying seed through tenders and supply poor quality seeds to farmers. <https://www.linkedin.com/pulse/spurious-seed-kills-farmers-medicine-patients-both-basu-ph-d-1d>

2. Agriculture being a State Subject, fixation of MSP may be done by the states as the cost of cultivation varies from state to state and so also the procurement by local agencies.

3. Food processing industries including edible oil manufacturers should be asked to procure raw materials from within the country following MSP.

4. The Associations dealing with agri commodities must plan to optimise production and provide incentives to farmers than guiding govt just for imports/ exports.

5. A centralised Cess Fund for Pulses and Oilseeds may be created with matching contributions from Commodity Association and related Food and Oil industries.

6. Special Agricultural Cess may be collected on food items served right from parliament canteen to hotels/restaurants and spent to support the cause of smallholder farmers dealing with pulses and oilseeds.

7. Impose 5 years moratorium on exports of water guzzling crops and more particularly broken-rice and sugar.

8. With the diminishing agricultural lands for rapid urbanisation and ever increasing population, engage a task force suggesting to make use half of arable lands lying vacant to feed people and create work opportunities. <https://www.linkedin.com/pulse/grow-1-get-3-harvests-commercial-importance-shift-areas-basu-ph-d>

9. Mission 'Doubling of Farmers Income' must be achieved before 2024 and the commitment fulfilled.

10. Decentralisation of agricultural set up from Delhi to different regions and elimination of dichotomy in agricultural research between ICAR and SAUs.

Finally, Govt of India may declare Agriculture as National Activity and PM may inaugurate planting of Nutri-Cereals during rainy season and Oilseeds/Pulses in post-rainy, in the line of celebration Yoga, every year.



Freshwater Aquaculture: Magical Effects of Women Participation

Pratap Mukhopadhyay, Former Principal Scientist ,ICAR- CIFA,Bhubaneswar

The benefit of aquaculture (predominantly a rural activity) in fulfilling the preferential demand for aquatic food of high biological value , improving rural household earnings and their nutritional security hardly needs any emphasis . From a subsistence level backyard activity during the early sixties mostly in rural Bengal , the country is now the second largest producer of fish in the world and the sector has become a reasonably significant economic enterprise providing opportunity of generating self-employment . To a great extent, contribution in this transformation process has been from freshwater aquaculture .Its diversity is reflected in terms of – holding units, management systems and state of motion of water ; in the form of ponds, tanks, raceways, cages, pens ; extensive, semi-intensive, intensive, super-intensive; static systems and flow-through systems, respectively. Among all these, the pond aquaculture system is mostly the practised form of aquaculture in plain regions of our country; while the other forms are seen in hilly regions , where steep slopes are present. But, in all of them, whether its small ,medium or large-scale aquaculture, the sustainable yield increase especially is expected from optimization of inputs and simple management measures. .The various carp species feeding on the first or second link of food chain in the nature form the main pillars of aquaculture system in India, the notable ones to be cultured are - *Catlacatla*, *Labeorohita*, *Labeocalbasu*, *Labeofimbriatus*, *Labeo bata*, *Labeogonius*, *Cirrhinusmrigala*, *Cirrhinusreba*, *Cirrhinuscirrhosa*, *Puntius carnaticus*, *Puntius pulchelus* and *Puntius sarana*. The exotic carps include *Cyprinus carpio*, *Hypophthalmichthys molitrix* and *Ctenopharyngodonidella*. Besides there are certain catfish species (both air-breathing and non-air breathing) including *Clarias batrachus*, *Heteropneustesfossilis*, *Ompokpabda*, *Mystusvittatus*,murrels(*Channa sp.*), featherbacks (*Notopterus sp.*) , perch (*Anabas sp.*), cichlids (red and GIFT tilapia sp.), eels (*Mastacembeluspancalus*), and even prawns (*Macrobrachium sp.*) .

Management practices are generally very simple involving environmental and biological interventions which can be broadly classified as; pre-stocking, stocking and post-stocking operations, where. Pre-stocking mainly concentrates upon clearing the macrophytes (to some extent) and unwanted fishes and such from the pond after its proper manuring and aeration to the required extent. Stocking management mainly pivots around precautional measures adopted while releasing the fishes to the pond with utmost care and attention ,ensuring natural food organisms – phyto& zooplankton , supplementary feed provision using locally available agro-based by-products ,emergency care schedule to mention a few following the principle of common 'dose-response curve' (nutrient / energy supply versus fish growth). The post stocking management highlights upon the precautional measures for maintaining proper health conditions of both – fish and the pond. Allied management also deals with the proper aeration of the pond, reducing free CO₂ as well as converting unionized ammonia into nitrate nitrogen, along with its proper manuring; liming the pond to maintain desired pH levels , alkalinity and turbidity in recommended level and make nutrients available to the pond environment. It helps in buffering and enhancing the microbial action, thereby reducing the organic load at the pond bottom. Periodic raking the pond bottom with a nailed iron rod helps escape of obnoxious gases formed at the pond bottom creating a stress-free water-soil ecology .

Unlike traditional agricultural activities wherein right from seed sowing till harvesting women participation was and is still today considered essential, aquaculture activity so far remained restricted to men only. In the changing rural scenario when due to the migration of a fairly large number of the rural boys /men-folk for socio-economic and other reasons in search of alternate livelihood are compelled to near-by and distant cities for jobs/business purposes leaving their own homes, the rural women without having any option and equipped with vocational skill training in women-friendly aquaculture through participatory approach started working together shouldering responsibilities equally and jointly.. This indicated missionary zeal, their capabilities in bringing to the fore the latent potentials of rural women for generously contributing towards family earnings and self-employment generations in the villages without jeopardizing their routine household activities. Now that NFDB (National Fisheries Development Board, headquarters located at Hyderabad), State Directorate of Fisheries and various NGOs working in this sector have also come forward with a spectrum benefits for development of fish seed rearing, carp polyculture, fish feed preparations,, fish farm tool & implement management, and even induced fish breeding through hypophysation technique and that devoted women worker team leader willing to serve fellow rural women forming self-help groups now have access to some unconventional and unnoticed water resources such as canals, backyard ponds, village ditches, most of which remained under-utilized or unutilized so far, some vast water areas choked with aquatic weeds remaining unproductive for years together and that they are now equipped with the required training, periodic exposure to successful farms & hatcheries and simultaneously developing expertise in mobile communication through use of the android handsets several of our womenfolk with their sincerity and seriousness have already developed competence in virtually all aspects of aquaculture including, fish breeding, pond preparations, spawn/fry/rearing, fingerling raising, farm-made feed formulation, its processing, storage including, application in farm ponds and tanks, procedures for emergency care of fish including health and disease diagnosis and so on thereby strengthening fish production system and continuously keeping in touch with fisheries or aquaculture institutions, Krishi Vigyan Kendras, various aquaculture related capacity building centres. This is how we have started harnessing potential of half of our population whose contributions could not be derived fully for nation building purposes so far to bring about magical changes in life and quality of people in the rural areas.

The long term sustainability and future aquaculture expansion should be aimed towards development of farming system, which improves the overall efficiency of resource use and are based upon primary renewable resources. This will be both economically and ecologically viable. thereby establishing the real 'magical effects' of the women participation in aquaculture..It is important that available waterbodies under all panchayets / talukas be utilized for production of edible aquatic organic food sources and if possible social aquaculture in the line of social forestry be introduced with local women participatory approach wherever possible utilizing the small indigenous fish species. This may serve the dual purpose of conservation of these species some of which are becoming endangered as well as production of inexpensive and yet the best edible animal product for better human health.





Members of Women SHG engaged in fishing activity in village pond



Low Cost Ornamental Fish Production



Magur Fry Sorting



Fish Processing



Fish Egg Hatching

Healthy diets - Healthier planet

Asok Biswas ,Former Chief Technical Officer , ICAR-CIFE,Kolkata

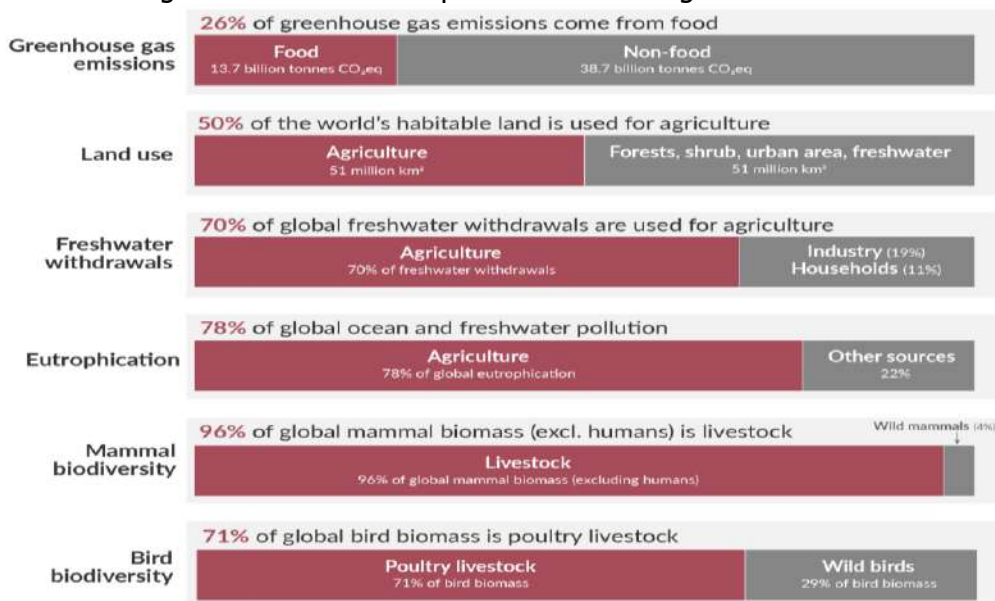
Our food systems generate one-third of global greenhouse gas emissions. Feeding around eight billion people and meeting the dietary needs from individuals in developed and developing countries leads to loss in biodiversity on land and water via deforestation, overfishing, and ecosystem degradation, among others. Water and energy usage and food waste are also areas of consideration on how our food system contributes to climate change.

Reducing the global average annual individual carbon footprint from 6.3 tonnes in 2020 to 2.1 tonnes in 2030, as recommended by experts, will no doubt involve changes to our food system and diet. Having greater awareness and making small changes will not only help us reduce greenhouse gas emissions and individual carbon footprint but will improve air quality, health, and save money.

Environmental Impacts of Food Production

Agriculture has a significant environmental impact in several key ways – i) it requires large amounts of fresh water and pollutes rivers, lakes, and oceans by releasing nutrients, ii) responsible for around one-quarter of the world's greenhouse gas emissions, iii) half of the world's habitable land is used for agriculture and large parts of the world that were once covered by forests and wildlands are now used for agriculture. This loss of natural habitat has been the main driver for reducing the world's biodiversity. Wildlife can rebound if we reduce agricultural land use and allow natural lands to restore. Ensuring everyone has access to a nutritious diet sustainably is one of the most significant challenges we face.

Fig. 1: Environmental impacts of food and agriculture



Source: Poore & Nemecek (2018)

The largest portion of food-related greenhouse gases comes from [agriculture and land use](#). It includes – i) methane from cattle’s digestive process, ii) nitrous oxide from fertilizers used for crop production, iii) carbon dioxide from cutting down forests for the expansion of farmland, iv) other agricultural emissions from manure management, rice cultivation, burning of crop residues, and the use of fuel on farms.

Type of foods responsible for greenhouse gas emissions

The climate impact of food is measured in terms of greenhouse gas emissions intensity. The emissions intensity is expressed in kilograms of “carbon dioxide equivalents” – which includes not only carbon dioxide but all greenhouse gases – per kilogram of food, per gram of protein.

[Animal-based foods](#), especially red meat, dairy, and farmed shrimp, are generally associated with the highest greenhouse gas emissions. This is because: i) [meat production](#) often requires extensive grasslands, which is often created by cutting down trees, releasing carbon dioxide stored in forests, ii) cows and sheep emit methane as they digest grass and plants, iii) cattle’s waste on pastures and chemical fertilizers used on crops for cattle feed emit nitrous oxide, iv) [shrimp farms](#) often occupy coastal lands formerly covered in mangrove forests which absorb huge amounts of carbon.

[Plant-based foods](#) – such as fruits and vegetables, whole grains, beans, peas, nuts, and lentils – generally use less energy, land, and water, and have lower greenhouse gas intensities than animal-based foods. Here are two charts showing the carbon footprint of different food products.

Fig. 2: Greenhouse gas emission per kilogram of food

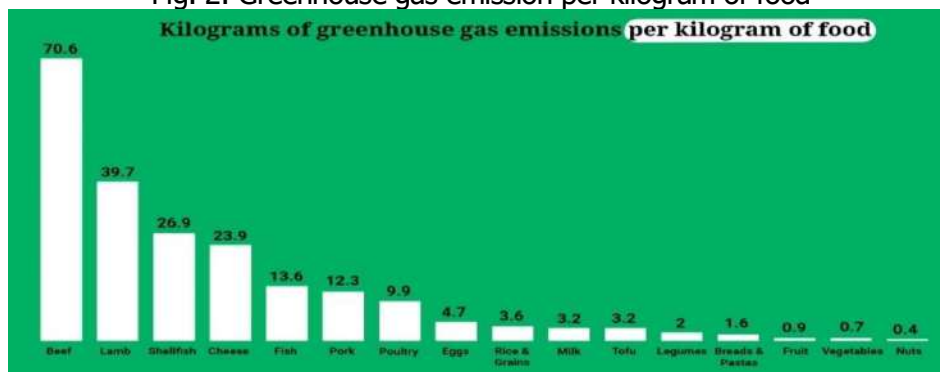
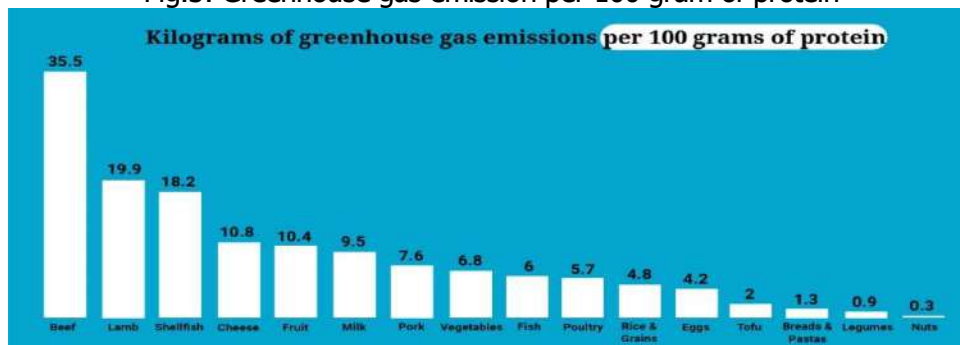


Fig.3: Greenhouse gas emission per 100 gram of protein



Emissions are measured in kilograms of carbon dioxide equivalents, kg CO₂e

How can food-related emissions be reduced?

Reducing emissions from the food sector requires changes at all stages, from producers to consumers. The major steps that can be adopted - shifting food systems towards plant-rich diets – with more plant protein (such as beans, chickpeas, lentils, nuts, and grains), a reduced amount of animal-based foods (meat and dairy) and less saturated fats (butter, milk, cheese, meat, coconut oil and palm oil).

But animal products remain an important source of food security, nutrition, livelihoods for large numbers of rural populations around the world. Improved feeds and feeding techniques can reduce methane generated during cattle's digestion as well as the amount of gases released by decomposing manure. Smaller herd sizes, with fewer, more productive animals can also help. Better agricultural practices, such as improved manure and fertilizer management, rotational grazing to maintain healthy soil and the restoration of degraded lands can significantly reduce greenhouse gas emissions. Reducing food waste is also important. Almost one billion tons of food – seventeen per cent of all food available to consumers worldwide – goes into waste bins every year.

To preserve a liveable climate, greenhouse-gas emissions must be reduced by half by 2030 and to net zero by 2050. But the transition to a low-carbon world also requires the participation of citizens – especially in advanced economies.

'Act Now' - United Nations campaign

'Act Now' is the United Nations campaign for individual action on climate change and sustainability. The 'Act Now' campaign was launched at the UN Climate Change Conference (COP 24) in December 2018. By changing our habits and making choices that have less harmful effects on the environment.

- Eat more plant-based foods

Switching to a plant-based diet can reduce an individual's annual carbon footprint by up to 2.1 tons with a vegan diet or up to 1.5 tons for vegetarians.

- Throw away less food

By eating only what we need and reducing food waste, an individual can reduce their carbon footprint by up to 1.3 tons annually.

- Shop local

Eating local can help ease the food miles (how far our food travels, it reduces greenhouse gas emissions of vehicles used for transport of food) can help an individual save up to 1.1 tons of carbon emissions annually.

- Start composting

Composting can be an impactful action to reduce emissions. Compost becomes nutrition-dense soil that can then be used for farming or planting which adds back precious nutrients into the soil.

References

Babiker, M., G. Berndes, K. Blok, B. Cohen, A. Cowie, O. Geden, V. Ginzburg, A. Leip, P. Smith, M. Sugiyama, F. Yamba, (2022) Cross-sectoral perspectives (Chapter 12). In IPCC, 2022: [Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change](#) [P.R. Shukla, et al (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.005.

[Poore, J. and Nemecek, T. \(2018\). Reducing food's environmental impacts through producers and consumers. *Science*, 360\(6392\), 987-992..](#)

News / Technology Summary

Agriculture Production Statistics

National targets for total food grains production are set at 332 million tonnes for the year 2023-24. Target for production of pulses have been fixed at 29 million tonnes compared to 27 million tonnes this year and oilseeds production will be increased from 40 to 44 million tonnes in 2023-24. Millet (Shree Anna) production has to be increased from 16 million tonnes in 2022-23 to 17 million tonnes in 2023-24. India is set to become International Hub for millets. The strategy would be to increase area through inter-cropping and crop diversification and productivity enhancement through introduction of HYVs and adoption of suitable agronomic practices in low yielding regions.

(Source: <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1921735>)

Agriculture Innovation: 10 Tech Trends to Watch in 2023

A UN study found that about 9.9% of the world's population still goes hungry, so the thought of feeding almost 10 billion mouths by 2050 is a daunting prospect. With environmental changes hard to predict, we must turn to innovation in agriculture technology. Technologies are *Bee Vectoring Technologies*, *Precision Agriculture*, *Indoor Vertical Farming*, *Livestock Farming Technology*, *Laser Scarecrows*, *Farm Automation*, *Real Time Kinematic (RTK) Technology*, *Minichromosome Technology*, *Farm Management Software* and *Water Management Technology*. From advancements in precision agriculture to farm automation, genetics, and water management tech, innovations in agriculture technology provide the means of smarter, safer, more productive farming.

(Source : <https://masschallenge.org/articles/agriculture-innovation>)

Crop Varieties Released in International Year of Millets

In commemoration of the International Year of Millets 2023 and to encourage farmers to cultivate more areas under millets, and the consumers to take more millets in regular diet, four new varieties: pearl millet (*Bajra*) hybrid COH 10, Sorghum (*Jowar*) K 13, Kudiraivali ATL 1 and Panivaragu ATL 2 were released.

(Source : https://www.google.com/search?rlz=1C1VDKB_enIN959IN959&sxsrf)

Biofortified Crops

Biofortified staple crops such as provitamin A-biofortified sweet potato ('orange sweet potato'), zinc-biofortified rice ('zinc rice') and iron-biofortified beans ('iron beans'), developed by

selective breeding, have been introduced into developing countries with the goal of reducing micronutrient deficiencies.

(Source :<https://onlinelibrary.wiley.com/doi/10.1111/nbu.12347>)

Miyazaki, World's most expensive mango found in West Bengal

The Miyazaki mango known as Egg of the Sun (*Taiyo-no-Tamago* in Japanese) is usually found in Japan. However, a local in West Bengal's Dubrajpur(Birbhum) had planted a Miyazaki mango tree two years ago. It is priced at an exorbitant rate of Rs 3 lakh per kilogram. The Miyazaki mango is round in shape with a deep yellow or orange-red skin. The skin is smooth and thin and the flesh is juicy and vibrant in colour. The texture of the mango is soft and smooth, with a creamy consistency that melts in the mouth. Mangoes, rich in antioxidant containing beta-carotene (Vitamin A) and folic acid, are over 350g in weight and have 15% or higher sugar content. A person in Madhya Pradesh has also started growing this mango and deployed Security guards and Security dogs to protect this rare mango in his garden.



Miyazki Mango (Ruby -red)

(Source :[Indiatoday.in/india/story/miyazaki-mango-costliest-price-west-bengal-japan-expensive-2388242-2023-06-03](https://indiatoday.in/india/story/miyazaki-mango-costliest-price-west-bengal-japan-expensive-2388242-2023-06-03))

Engineering Blue Rose

A blue rose is a flower of the genus *Rosa* (Family Rosaceae) that permits blue to violet pigmentation, instead of the more common red, pink, white and yellow. Blue rose, not available in Nature is created by genetic modification and contains Blue pigment Delphinidine. Genetic Engineering involves 3 alterations- adding two genes and interfering with another. The Blue plant pigment delphinidin is cloned from the Blue Pansy flower into a purple – red garden rose, resulting a dark burgundy rose. The RNA interference technology (RNAi) is used to depress all other color production blocking a crucial protein by endogenous genes by blocking a crucial protein in color production, called dihydroflavonol-4- reductase (DFR) with the addition of a protein variant, not blocked by RNAi but showing the color of the blue

pigment. Gm roses are being grown by a Japanese company, Suntory based in Osaka selling US\$22 to 35 a stem.



Innovations in Biotechnology: Genetically Engineered Blue Roses

Controversies regarding the genetically engineered Blue roses and ethical concerns are existing.

(Source : <https://natureofhome.com/blue-roses>)

Training of Farmers for use of Nano Fertilizers

Indian cooperative **IFFCO** is launching a national campaign to promote the use of nano fertilisers, with plans to procure 2,500 agri-drones and train 5,000 rural entrepreneurs. The drones will be used to spray IFFCO's nano urea and nano di-ammonium phosphate products.

(Source : <https://economictimes.indiatimes.com/news/economy/agriculture> , July 4, 2023)

Obituary

Dr. Rajat Kanti Tarat had retired from service on superannuation as Sr. Farm Manager(T-9) from ICAR Research Complex for NEH Region, Barapani , Meghalaya and left for heavenly abode on 01.05.2023 . We do express our deep condolences to the bereaved family members and pray for eternal peace of his noble soul .



Late (Dr.) Rajat Kanti Tarat

- আছে দুঃখ, আছে মৃত্যু, বিরহ দহন লাগে। তবুও শান্তি, তবু আনন্দ, তবু অনন্ত জাগে। তবু প্রাণনিত্যধারা,
হাসে সূর্যচন্দ্র তারা, বসন্ত নিকুঞ্জ আসে বিচিত্র রাগে। - রবীন্দ্রনাথ ঠাকুর

